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**FINANCIAL ASPECTS OF THE DEVELOPMENT OF ELECTRONIC  
PAYMENTS BRINGING TO AN INCREASE IN THE  
COMPETITIVENESS OF SMALL AND MEDIUM-SIZED ENTERPRISES**

**ABSTRACT**

of a dissertation for acquiring the educational and scientific degree “Doctor”

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The dissertation has a volume of 190 pages and 7 pages of appendices. Its structure consists of an introduction, an exposition in three chapters, a conclusion, scientific contributions, references, and 2 appendices. 84 figures and 11 tables are presented. The list of information sources includes 175 sources in English and Bulgarian.

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## I. GENERAL CHARACTERISTICS OF THE DISSERTATION

### Relevance of the problem

The emergence of electronic payment systems is a phenomenon with significant economic, political, and social consequences. In theory and practice, it is defined as the third monetary revolution and makes it possible to talk about the emergence of a “new economy” based on the digitalization of business processes. This “new economy” is taking place in a global Internet environment and new financial entities are entering and establishing themselves in it.

Electronic payment systems appeared in the process of the development of information and communication technologies and led to the creation of new types of payment instruments – electronic ones. In this way, the global payment system rapidly moved towards cashless transactions of individuals, businesses, and governments. Customers were offered a wide variety of electronic payment instruments – credit and debit cards, online banking, mobile banking, virtual payment instruments, etc. Their use facilitated and abruptly improved people's quality of life, reorganised and raised business to higher technological levels.

The introduction of electronic payment technologies is taking place at a rapid pace, affecting public sector organizations as well. These processes pose serious challenges to theorists and researchers. Several new concepts were introduced in practice, such as electronic money, electronic payment instruments, mobile payments, electronic commerce, digitalization, digital transformation, etc., which have not been the subject of in-depth scientific research in Bulgaria so far. These new concepts are not only related to the technological process, but they are also part of a new phenomenon – the digital transformation. It is a large-scale and unprecedented social phenomenon, leading to a qualitative change in both public life and the life of an individual. It encompasses multiple stages and elements, technologies, interactions, operations, integrations, and changes.

The theory, not only in our country but also at the international level, perceives electronic payments and their rapid development still in a fragmentary way and as separate aspects, with the occurring changes being interpreted and characterized post factum. The impact of electronic payments on small and medium-sized enterprises, which represent the backbone of the Bulgarian economy and largely determine the trends in its long-term development, has not been studied. The path of the further development of the Bulgarian economy depends to a large extent on the attitude of small and medium-sized enterprises towards new business and finance models. In view of this, **the main question** posed by the current dissertation is: what is the essence, significance and influence of electronic payments on small and medium-sized enterprises, to what extent are the electronic payments accepted and used by small and medium-sized enterprises in Bulgaria and what are the factors that determine or interfere with this process.

**The central thesis**, which is discussed and proven by the present dissertation research, is that the expansion of application areas of electronic payments and their increase in type and volume in small and medium-sized enterprises (SMEs) contribute to increasing their competitiveness and growth and help shrink the share of the grey sector in the economy as a whole and raise tax revenues.

### Working hypotheses:

1. The increase in the number of POS terminals and the volume of card and electronic payments used and accepted by SMEs leads to an increase in the competitiveness of small and medium-sized enterprises – **confirmed**.
2. There are conditions for further increase in the number of cards (debit and credit) and the use of a card and digital payments – online payments, via mobile phones, via POS terminals – **confirmed**.
3. The introduction of electronic payment methods by SMEs depends mostly on the following factors – **confirmed (partially by the empirical model and fully by the econometric model)**
  - level of digitalization of SMEs
  - presence of grey (shadow) economy;
  - presence of different stages of development of the regions in the country;
  - service charges and fees;
  - consumer behaviour and attitudes towards the use of electronic payments.

### Working Hypotheses of the Empirical Study:

1. Card payments at a physical POS terminal are the most common type of electronic payment in SMEs – **confirmed**.
2. Digital payments and the use of virtual POS terminals (accepting online payments with bank cards) are popular among a small number of SMEs, despite their rapid increase in numbers – **confirmed**.
3. Merchants who have not installed POS terminals pointed out the lack of financial benefit due to the rising costs as the main reason for not using POS terminals – **confirmed** (although this answer has the highest share among merchants not accepting electronic payments (34.1%), it is not chosen by most of them).
4. Wage increases upon introducing electronic payments in the enterprise would be most important to employees – **confirmed** (the employers that took part in the survey put this answer last).

Contradictory attitudes were found among the questioned employers: on the one hand, they believed that the use of card payments implies more qualified work of the employees and increases their knowledge, but on the other hand, they do not think that this should lead to a salary increase).

5. The shadow economy is among the main factors that determine the reluctance to accept electronic payments – **partially confirmed** (the shadow economy was mentioned by the respondents as part of the bunch of factors, but the impact of other factors was assessed to a greater extent). However, this hypothesis was fully confirmed when applying the econometric model and the theoretical analysis of the shadow economy in the field of payments.

## II. DISSERTATION OUTLINE

### 1. First chapter: Theoretical and methodological foundations of the payment system study in small and medium-sized enterprises

The first chapter examines the theoretical foundations, the nature and characteristics of electronic payment systems and electronic payments, the regulations in this sector, the main types of electronic payment instruments with a focus on payment cards as the most used instrument currently by SMEs in Bulgaria. The Single Euro Payments Area (SEPA), the European payment system TARGET2, etc., as well as innovative technologies in the field of electronic payments, were discussed.

#### 1.1. Review of literary sources

Foreign scientific studies and economic analyses consider that the development of payment systems is caused by the introduction of electronic payments, as well as the new financial models that appear with them.

Many works are devoted to the stages of development of payment systems – the emergence of the European systems SEPA<sup>1</sup>, TARGET2<sup>2</sup>, RTGS<sup>3</sup>, EBA<sup>4</sup>, the American and Asian payment systems, as well as the new prospects emerging with card and mobile payment systems.

Other studies focus on the advantages of electronic payment, while also pointing out the problems arising in relation to the security of processes and users.

Electronic payment systems are defined in the theory from the point of view of various branches of the economy, such as accounting, finance, business technology, information technology, etc.

The prevailing opinion is that they are a method or a payment mechanism using the Internet or an electronic network (electronic communications), focusing on their main characteristics – security and convenience, remote access to management of bank accounts and transactions, and a technological portal for innovation of the global economy.

In the Bulgarian economic literature, the importance and development of electronic payment systems and electronic payments is a new topic on which there is very little prior research. The process of creating effective payment systems in Bulgaria has been researched by O. Stoichkova and R. Radkov, E. Mihailov and B. Bozhinov (Stoichkova, Kitanov, 2010, pp. 97-111; Radkov, Mihailov, Bozhinov, 2004, pp. 234-247; 324). They focus on the construction of the Real-time gross settlement (RTGS<sup>5</sup>) systems, the interbank payment system BISERA (Banking Integrated System for Electronic Transfers), the electronic budget payment system SEBRA, the payment system for card payment operations BORICA in Bulgaria, the European payment systems EURO I, Euro-giro, etc. The concepts of cashless payments, electronic money, electronic commerce, electronic finance, which are closely related to the topic of the dissertation, are included, and defined in the legislation and the theory of banking in Bulgaria. The problem under consideration is discussed in them in the context of the general banking theory.

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<sup>1</sup> From English *Single Euro Payments Area*.

<sup>2</sup> From English *Trans-European Automated Real-time Gross Settlement Express Transfer System*.

<sup>3</sup> From English *Real Time Gross Settlement*.

<sup>4</sup> From English **European Banking Authority**.

<sup>5</sup> From English *Real-Time Interbank Gross Settlement System*.

In Bulgarian economic journals, more and more attention is paid to the introduction of innovations in the field of electronic payments, especially to card and mobile payment instruments.

Regarding the definitions of the conceptual apparatus, a few Bulgarian theoretical sources have adopted the European definitions, which are included in our national legislation.

The development of electronic payments has led to the emergence of other new terms and concepts, such as electronic money, electronic payment instruments, mobile payments, electronic commerce, digitalization, digital transformation, etc., which so far have not been the subject of in-depth scientific research in our country. These concepts are not only related to the technological process of payment but are also part of the overall phenomenon digital transformation.

One of the aspects that have remained outside the scope of scientific research in our country is the influence of modern electronic payment methods on the organization, development, and competitiveness of SMEs.

## 1.2. Research Methodology

Electronic payments in SMEs are a new phenomenon both in Bulgaria and internationally and are constantly evolving and changing. The problem has been insufficiently examined and analysed, and therefore the applicable theories related to electronic payments have been neglected in the studies carried out to date.

Kabir's meta-analysis (analysis of analyses) of 188 research articles in the field of electronic payments, of which 51 were empirical studies (Kabir, Saidin, Aidi, 2015), found that the most used theory on which the methodology of the studies was based, was the Technology Acceptance Model (TAM<sup>6</sup>) and the Unified Theory of Acceptance and Use of Technology (UTAUT<sup>7</sup>). The acceptance of technologies by consumers and businesses is of utmost importance and therefore various theories or models were used to predict their behaviour. The TAM model was developed by Davis (Davis, Bagozzi, Warshaw, 1989) and further developed by Gable and contains indicators for determining the level of acceptance of information systems by the organisation and its collaborators. Gable's indicators were developed to evaluate the performance of all information and communication systems in the organisation: computers, hardware and software subsystems, the quality of service, etc.

Given the object and subject of the study, the author has simplified the number of indicators that are used, adapting them to the electronic payment systems of SMEs. The author has developed her own questionnaire for conducting the empirical research, following the adapted TAM model. The research focused on respondents from SMEs and businesses, whose attitudes and behavior related to the adoption of electronic payments remained poorly studied.

In a survey conducted for the needs of the dissertation, the following indicators were studied:

**Effects on the individual** – training and qualification, individual productivity, job satisfaction, developing adaptability skills and attitudes towards technological innovations;

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<sup>6</sup> From English *Technology Acceptance Model*.

<sup>7</sup> From English *Unified Theory of Acceptance and Use of Technology*.

**Effects on the enterprise** – performance improvement, cost reduction; personnel requirements; change in business processes;

**Quality of the system** – benefits resulting from use; expanding customer database; quality management; reliability, complexity;

#### *1.2.2. Purpose, tasks, object, and subject of the study*

**The object of the study** is the nature and content of electronic payment systems and the use of electronic and card payments and innovative payment instruments by SMEs in Bulgaria.

**The subject of the study** is the financial aspects arising from the expansion of the use of devices for processing card payments (POS terminals), payment cards and other electronic payment instruments by SMEs in Bulgaria.

The aim of this dissertation was to study the adoption of electronic payments by SMEs, the benefits, and effects of their use on the development of business and the economy in general, and to outline the challenges and opportunities for progress in this area.

For the realisation of the defined goals, the following **main tasks** have been completed:

- Study of the nature and content of electronic payment systems, innovations in the field of electronic payments and types of electronic payment instruments;
- Study of the nature and role of SMEs in the Bulgarian economy;
- Study of the share of annual sales of SMEs with and without POS terminals;
- Study of the use of POS terminals by SMEs in large and small cities;
- Study of the dynamics of the number of SMEs with conditions for the introduction of POS and by annual turnover indicator;
- Study of the level of adoption of card payments and innovative payment instruments by SMEs based on TAM according to Gable's methodology;
- Study of the factors that impact the use and adoption of card payments by SMEs and the attitude of SMEs towards new payment systems;
- Study of the benefits of using POS terminals for the Bulgarian economy and for SMEs;
- Creation of a theoretical model for studying the impact of electronic payments on the Bulgarian economy.

**The following research methods were used:**

**General scientific research methods** – analysis, summary and synthesis, induction and deduction, comparison, analogy.

**Comparative analysis** was used to compare the data for companies using and not using POS terminals, as well as companies located in different countries in Europe, in different locations in the country, from different sectors of the economy, etc., as well as for determining the degree of development and digitalisation of SMEs compared to other EU member states. It was based on available official information and data from the National Statistical Institute, Eurostat, BNB, and the Ministry of Finance.

**The document-based research** covers a set of scientific materials, reports, studies, etc., related to the nature of payment systems, the digitalisation of SMEs, electronic and card payments.

Sources of Bulgarian and foreign authors and organizations working in the field of payments were used.

**Statistical analysis** was used to determine the degree of implementation and use of electronic payments by SMEs for different periods, for which data was collected from the National Statistical Institute, Eurostat, and BNB, from financial reports and studies of the Ministry of Finance and other official sources.

**The survey method based on a specially developed questionnaire** was used to collect the empirical data in the conducted **empirical sociological study**. It also used a testing methodology for the presence of regularity through  $\chi^2$  (chi-square) analysis (Goev, 1996). The survey (Chapter 3) and the statistical analysis (Chapter 2) were carried out based on a selected two-stage sample of SMEs, determined based on the SME's subject of activity, which allows the execution of card payments and the installation of POS devices, or the so-called **Total Addressable Market (TAM)** that can theoretically be served by a particular product or service. Upon determining its volume, economic activities that do not need to accept card payments, such as various manufacturing enterprises, the construction industry, etc., were excluded. Next, the **Serviceable Addressable Market (SAM)**<sup>8</sup> of card payments was determined, which is part of the total addressable market. The total addressable market to which a specific service/product can be addressed (Total Addressable Market, TAM) is part of the **total addressable accessible market**. This selection additionally excludes businesses whose nature implies high- and low-value payments, such as trade in agricultural machinery, haberdashery, sale of newspapers and magazines, etc., where the use of payment cards as a payment instrument is possible, but not suitable enough. Cash payments or other types of electronic payments are more relevant to them. The selection of SMEs was carried out according to their subject of activity in aggregated groups, based on the Classification of economic activities of the NSI (NACE 2008).

To determine the specific respondents, the survey was based on an additional stratified sample, including the 5 major cities of the country and one common stratum for all others. The survey is representative of SMEs with conditions for using POS.

**The method of econometric modelling** was used to compile a theoretical model for the impact of electronic payments on the Bulgarian economy. Two theoretical models have been compiled regarding the impact of electronic payments on revenues from excise duties and VAT. **Correlation analysis** was used to determine the factors with a significant impact on revenues from excise duties and VAT. Then, a **regression analysis** was used for the degree of influence of each factor on excise duties and VAT revenues.

The presented methodology is a combination of different methods – statistical, empirical, and econometric and allows for verifying, arguing, and proving all aspects of the central thesis of the dissertation. The degree of use of electronic payments by SMEs and the processes of digitalization in them was proven through statistical and comparative methods. Since the available data was insufficient, an empirical study was conducted to investigate the adoption rate of e-payments and the benefits for SMEs, as well as the problems and reasons hindering their adoption and use. Through the theoretical model, the positive influence of electronic payments on the Bulgarian economy by increasing excise duty and VAT revenues and clarifying the sources of cash flows

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<sup>8</sup> From English Serviceable Addressable Market.



was revealed. The methodology used makes it possible to formulate recommendations to state institutions to support the expansion of electronic payments in SMEs.

### 1.3. Payment system – concept and elements

In the first chapter of the dissertation, a complete description of the object of the dissertation research was made – electronic payments and related concepts, electronic payment systems, payment instruments in the context of significant global economic and social processes – digitalisation and digital transformation. This proves the central thesis of the dissertation – the importance and necessity of expanding the field of application of electronic payments in SMEs to increase their competitiveness.

Nowadays, the economic literature and the Bulgarian legislation use the definition of a payment system, included in the Directive 98/26/EC of the European Parliament and of the Council, amended by Directive 2009/44/EC of the European Parliament and of the Council. Article 122, Paragraph 1 of the Law on Payment Services and Payment Systems (2018) provides a legal definition of the term payment system. According to it, it is a system dedicated to the transfer of funds that operates based on formal, standardised procedures and common rules for the processing, clearing and/or settlement of payment transactions, and is operated by an operator. The payment system is characterised by its elements: payment instruments, payment infrastructure, participants in the system and the arrangements between them, the regulatory environment.

The participants in the payment system have been examined in detail. These are the **payment institutions** participating in a system with settlement finality – banks, credit institutions, investment intermediaries, non-bank institutions, payment service providers regulated by the European Directives PSD1(2009) and PSD2(2015).

An important player is **the settlement agent** who manages the direct members' payment accounts and transfers amounts between them to achieve finality.

The **central counterparty**, which is a person located between the institutions in a settlement finality system, acting as the exclusive counterparty to those institutions in relation to their transfer orders.

The **clearinghouse** is responsible for calculating the net positions of the payment institutions, any central counterparty and/or any settlement agent. Currently, banks exchange payment files bilaterally and reconcile the net amount through the RTGS system.

Each system with settlement finality is serviced by a **system operator**. The operator can also act as a settlement agent, central counterparty or clearing house and is legally responsible for its functioning. The operator receives a license to carry out the activities from the BNB, which enters it in a public register accessible electronically.

**Central banks** usually act as settlement agents and most often operate large value RTGS systems. They are responsible for the supervision and smooth functioning of the payment systems.

According to the rules of the system, one and the same participant can act as a central counterparty, settlement agent or clearing house in a system with settlement finality or can perform all these functions or part of them (Article 130, Paragraphs 1-3 of the Law on Payment Services and Payment Systems).

**Payment service providers** are also participants in the payment system.

The concept of **payment service** includes any business activity related to: depositing and withdrawing money in cash from a payment account and all operations related to its servicing; execution of direct debits; payment operations using payment cards or similar devices; credit and periodic transfers, execution of direct debits, including one-off debits; issuance of payment instruments and/or acceptance of payment transactions; available money transfers.

Under the Bulgarian law, institutions entitled to provide payment services are banks and payment institutions, electronic money companies, the European Central Bank, and the national central banks of the member states, as well as providers of account information services (Article 3 of the Law on Payment Services and Payment Systems).

The types of payment systems are defined from the point of view of the functions they perform in the payment process. They are as follows:

**Gross Settlement Systems** – These are RTGS systems. They make small amounts of large gross value payments through the settlement accounts of the central bank.

The **real-time gross settlement system for BGN payments – RINGS** in Bulgaria is organised and operated by the BNB with participants BNB, the banks licensed in Bulgaria and the branches of foreign banks, the system operators BISERA, BORICA, SEP, etc.

Through RTGS, the settlement of payments in BGN on the territory of Bulgaria is carried out immediately, unconditionally, and individually in real time for each payment order. The BNB may be the operator of a national component to the settlement system for EUR payments of the **Trans-European Automated Real-time Gross settlement. Express Transfer system (TARGET)**.

**Net settlement systems** – banks continuously send payment instructions to them within a given period, and the mutual claims and liabilities of the participants are recalculated on a multilateral or bilateral basis. The settlement takes place at a precise moment.

**Hybrid systems** – Hybrid systems represent a combination of the previous two types. Settlement takes place in shorter time intervals, bringing this type of system closer to real-time gross settlement systems.

**Auxiliary systems** – they serve the settlement performed by RINGS in connection with the finality of the payment such as BISERA, BORICA, etc.

#### **1.4. Payment instruments**

To provide a full description of the subject of the dissertation, attention was paid to payment instruments, since electronic payments are made through them. The Law on Payment Services and Payment Systems defines payment instruments as personalized devices and/or a set of procedures agreed upon between the user and the payment service provider and used by the payment service user for the purpose of submitting a payment order. They are an important element of any payment system. The selection of the type of payment instrument that will be used to make the payment shall be determined in the agreement between the payer and the creditor.

The **different types of payment instruments** were described, with an emphasis on non-monetary ones, which are cashless as funds are transferred between the payment accounts of the payee and the payer. Attention was also paid to electronic means of payment, as a type of non-cash payment

in the form of electronic information. Credit transfers, direct debits, internet banking, payment cards were characterised as payment instruments most closely related to electronic transactions.

Electronic money is also defined as a type of payment instrument by the Law on Payment Services and Payment Systems (Item 55, §1 of the Additional Provisions of the Law on Payment Services and Payment Systems) and its legal definition reflects Article 2, Item 2 of Directive 2009/110/EC of the European Parliament and of the Council. According to this definition, electronic money shall mean electronically, including magnetically, stored monetary value as represented by a claim on the issuer which is issued on receipt of funds for the purpose of making payment transactions and which is accepted by a natural or legal person other than the electronic money issuer. Electronic money is issued by banks, electronic money companies after obtaining a license, the European Central Bank (ECB), and the national central banks (NCBs) of the Member States. Requirements regarding the initial capital amount for the issuers to obtain an electronic money license have been regulated.

Various opinions regarding the forms of electronic money and their nature were discussed. They are defined as means of settlement and not as a payment instrument, as they can be used through another payment instrument (cards, mobile phones) or as a value that can be transferred via a payment instrument, but not only to the issuer of the payment product. At the same time the concept of **virtual money** was discussed as a concept different from electronic money. According to the definition, virtual money shall mean electronic value denominated in a new currency unit that has legal tender status (e.g., gold). It is like paying with physical money, but remotely, via the Internet through a special block transaction system, in which payer and payee participate. Unlike virtual money, with electronic money, the participants in the payment system are the issuers of electronic money (banks, electronic money companies, the European Central Bank (ECB), etc.), network operators, clearing organisations, banks, etc.

#### 1.4.1. Cards

Payment cards are of particular importance from the point of view of the subject of the dissertation as the most widespread and used payment instrument for electronic payments.

The **payment card** is defined as a type of personalised payment instrument (debit or credit card) that is used repeatedly to identify the authorised user of payment services and for remote access to a payment account and/or to a pre-agreed credit limit and with which transactions can be made (Ordinance No 3/2018 of the BNB). It is issued by banks and licensed payment institutions. The dissertation discusses the nature of payment cards as a materialised personalised device with recorded electronic information and as virtual content without a material carrier (plastic) with the necessary electronically recorded data for ordering the payment transaction. In such a case, it is not a personalised device, but a set of recorded procedures providing the payment.

The *security features* of the payment card, as well as ATM and POS terminal devices and the virtual POS through which the payment card transactions are carried out, are examined.

The mechanism for **card payments** was also analysed from the point of view of the subject of the dissertation research. The card payment system is part of the national payment system. The card payment process consists of several phases. It starts with the *initiation of the payment operation by the POS cardholder*, ATM, via Internet, e-mail, telephone, etc. This is followed by *authorisation of the payment operation* – a process of checking the payment card and identification of the cardholder. The information recorded on the card's magnetic stripe and chip is read, and the cardholder's security codes, passwords and PIN are checked. The bank issuing the

payment card approves the payment operation if it maintains its own authorisation centre or this is done by the authorised operator of the payment system, which acts as an intermediary between the participants.

The next stage is the implementation of *multilateral net settlement* (clearing) – the ATM and POS terminal devices on the territory of the country have a connection with a system operator of systems with finality of card-related settlement and net settlement at a given moment in RINGS. For all interbank card payments on the territory of the country, the clearing is carried out by BORICA. The final stage is the *final settlement* of interbank card transactions. During the final settlement, the settlement account in BNB of the bank that has issued the payment card is debited, and the amount of the card transaction is credited to the settlement account in BNB of the bank that financially supports the ATM or the merchant's account where the POS terminal is installed. The **specific participants in the card payment system** as a type of payment system with settlement finality, were highlighted.

Participants in this system are the issuers of the payment card – banks and payment service providers licensed by the BNB, cardholders as users of payment services, the system operator of the card payment system (for Bulgaria – BORICA – BANKSERVICE AD), merchants, when the POS terminal devices are located in their retail outlets, or in electronic stores, as well as Internet service providers – electronic payment systems when they are chosen as an intermediary between the other participants (PayPal, TransferWise, PaySera, Western Union, for Bulgaria, e.g. ePay, etc.).

The international financial market already uses a large assortment of card products. The most common **types of cards** in the Bulgarian payment system are characterised, such as debit and credit cards with their subtypes, prepaid cards, transport cards, corporate purchasing cards, etc. Special attention has been paid to **electronic wallets** as a type of prepaid card and to the **virtual payment card**. According to the definition of the ECB, this type of card is a payment method in which a temporary card number is issued with a limited validity period, which can be used in Internet operations (European Central Bank, 2012). Virtual cards are similar in nature to prepaid cards, but do not contain electronic money. They are an innovative product funded by any payment account of the holder with cash immediately before the transaction and offers greater security of payments on the Internet. The payment operation can be carried out only within the respective amount, and the balance, if any, is returned to the payment account. This card only works with virtual POS devices.

Virtual POS terminal is defined as a logically defined POS terminal used to execute transfer of funds on payment accounts, pay for goods and services, receipt of statements and execution of other payment and non-payment operations via Internet, ATM terminals or digital telephones, etc. (§1, Item 2 of Ordinance No 3 of the BNB).

The rapid development of computer and mobile technologies and the programming capabilities of the chip create favourable conditions for many **innovations** in the field of electronic payments. They allow the card to be used with additional functions, such as mobile payments by interacting with the SIM card of the mobile phone, combining payments on one card with the option of choosing a payment instrument owned by the payer. A lot of innovative technologies are already introduced in Bulgaria:

**Near-Field Communication (NFC)** is the technology on which contactless payment is based. It uses magnetic field induction to enable communication between devices when they're touched together or brought within a few centimeters of each other. All modern phones now support NFC chips and apps like Apple Pay and Google Pay to take advantage of the billions of RFID tags and

terminals already deployed. NFC supports interactive applications built on basic RFID capabilities such as automatically pairing Bluetooth headphones and Wi-Fi connections, automatic downloading of data or application from a poster or advertisement. A fundamental aspect of contactless card payments is that NFC does not require power to transmit and process NFC requests. This makes it possible to implement it in devices that do not have a battery, such as bank cards. A significant innovation of NFC is the cryptographic processing of bank payment cards used for contactless payments, which guarantees perfect protection of the original card data. The P2P connectivity, added to the ISO/IEC 18092 standard, allows devices such as smartphones, headsets, routers, home appliances and industrial equipment to initiate or respond to NFC requests. This enables the use of a wide range of interaction and connectivity models and enables smartphone vendors to build applications based on this technology.

The main advantages of NFC are the following: increasing the operational efficiency of payment processors, ensuring better payment cards security, allowing users to choose flexibly from multiple cards, convenience for users when paying for goods, simplifying access to back-end information, simple setup of new connections compared to other wireless protocols<sup>9</sup>.

### **Payments via mobile wallets**

A mobile wallet is a virtual wallet that stores information from a credit card or loyalty cards on a mobile device. It is a type of virtual wallet that is accessible through an application installed on a mobile device such as a smartphone or tablet. Mobile wallets use NFC (Near Field Communication) communication technology and many layers of encryption and security to ensure the safety of transactions. They are a convenient and secure way for consumers to make in-store payments directly through a mobile device. For this purpose, consumers need to tokenize and upload their bank card data to their mobile phone using various technologies – from bank mobile wallets to platforms such as Apple Pay, Android Pay, Samsung Pay, PayPal, etc. Thus, with one touch, payment is made without cash or a physical bank card. Merchants must have a POS terminal for contactless connection. However, due to different levels of technological advancement, different markets provide different versions of mobile wallet and mobile payment technologies<sup>10</sup>.

### **Accepting payments via smartphone**

On the brink of survival due to the COVID-19 pandemic, SMEs were forced to react dynamically and flexibly to changes and accelerate digitalisation processes, and along with it, to adopt new payment methods. Tap On Phone solutions are software solutions for a POS terminal (also Soft POS - Software for a POS terminal) that allow accepting payments with contactless payment cards and mobile devices directly on the merchant's mobile phone, at the point of sale, without additional hardware or cables, providing fast, secure, and convenient service. The main advantage of the innovative solution is the low cost of acquisition and maintenance on the part of the merchant, which is extremely beneficial for small and medium-sized businesses. This innovation is of great importance to customers with a low level of card payment acceptance such as outdoor markets traders, beauty salons, home services, etc., for whom traditional POS devices are unsuitable

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<sup>9</sup> <https://www.techtarget.com/searchmobilecomputing/definition/Near-Field-Communication>

<sup>10</sup> <https://www.paymentscardsandmobile.com/mobile-wallets-vary-different-countries/>

because of the nature of their business and are not mobile. Another advantage is the possibility of managing the business from one place – the smartphone, since the POS software usually provides opportunities for business analytics, various types of loyalty programs, possible integrations with accounting systems, etc.

## **Open Banking**

This is a system that allows secure data sharing between financial institutions using an application programming interface (API) and is necessary for the development of financial products and services. A product based on open banking is the payment initiation service that allows customers to pay online in a convenient and fast way and merchants to receive such payments without fees charged by banks. The European Payments Directive PSD2 requires all banks in Europe to publish public interfaces which give access to third parties (licensed providers of payment services), to the payment information on the bank accounts of the customers for the following services – providing account information and initiation of payment. For this purpose, customers must give their express consent for their information to be accessed or used. One of the biggest applications of open banking is direct payment from bank accounts while online shopping without intermediary as when using cards. In Bulgaria all Bulgarian banks have already published public interfaces and some of the larger ones already have account aggregation service in their electronic channels. An increasing supply of open banking services is expected, and the main focus will be placed on the payment directly from the bank account.

Internationally, new payment methods are also emerging that eliminate the need for face-to-face contact. Cashiers in grocery stores are replaced by self-service kiosks, in China there is an expansion of biometric payments, in the US voice commands are increasingly being applied. These innovations demonstrate the increased role of payments beyond the simple exchange of value for goods and services and are imperative to the continued growth of businesses<sup>11</sup>.

The accessibility of innovative technologies in the field of payments shows the need for a technological upgrade of SMEs, as modern technological solutions create a completely new concept of the payment process and the possibility of entering international markets. This undoubtedly boosts the growth and competitiveness of enterprises, which is significant evidence in support of the main thesis of the dissertation.

### **1.5. Legal foundations of electronic payments**

**The Law on Payment Services and Payment Systems (LPSPS<sup>12</sup>)**, which regulates the provision of payment services in Bulgaria, the two European acts of key importance for the development of electronic payments – Directive 2007/64/EC – PSD1 and Directive 2015/2366 – PSD2 of the European Parliament and of the Council, as well as other European documents on the subject have been examined. Their importance is emphasized regarding the concept of payment institutions as single licensed payment service providers on the territory of the community, as well as the creation of opportunities for the emergence of new payment service providers outside of banks; new

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<sup>11</sup> <https://money.bg/video/kakvo-e-otvoreno-bankirane-i-kakvo-e-prilozhenieto-mu-u-nas.html>  
<https://www.investopedia.com/terms/o/open-banking.asp>

<sup>12</sup> SG No. 20 effective as of 6 March 2018

payment methods, such as mobile and online payments and the new payment services are regulated.

### **1.6. European payments and SEPA**

Expanding the field of application of electronic payments and introducing innovative transaction systems allows Bulgarian SMEs to increase their growth, improve their competitiveness and enter the European markets. For this reason, the dissertation also examines the Single Euro Payments Area SEPA, the TARGET2 system and other European payment systems such as EBA CLEARING, EURO1, RT1, etc. European payment systems provide an opportunity to remove the fragmentation in payments created by national payment schemes and infrastructure, considering the creation of a single European market. With the introduction of SEPA, a new order of payments is launched, and competition increases at all levels. It introduces European standardization that allows commercial and corporate customers to send and receive payments in EUR, whether domestic or cross-border, and every payment service provider in the EU to use the same schemes. This offers the most favourable conditions for trade relations. Merchants can accept debit cards from all cardholders in the SEPA area and negotiate the most competitive terms inside and outside their country.

This part of the dissertation provides an opportunity to outline the prospects in the development of electronic payments and to prove their importance for the development of SMEs and the economy as a whole, which is the main thesis of the dissertation research.

### **1.7. Role of payment systems in the economy**

The role of payment systems is to unify the market, centralize payment operations between banks, and facilitate the mutual settlement of obligations between them, as well as to guarantee the convertibility of commercial banks' liabilities. Commercial banks use their central bank settlement account to ensure finality. The payment system replaces all interbank settlements with a single settlement in central bank money.

### **1.8. Conclusion**

Through the full and comprehensive characterisation of the object in the first chapter of the dissertation - electronic payments, considered as an essential element of electronic payment systems and in the context of significant world processes - digitization and digital transformation, the theoretical foundations of this insufficiently researched problem have been laid. The need to expand the field of application of electronic payments in SMEs is discussed, which is also part of the main thesis of the dissertation. SMEs can respond to the new disruptive changes in the field of payments only by knowing, using and expanding the different types of electronic payment instruments, the innovations in this field and the corresponding infrastructure.

## **2. Second chapter: Prerequisites and conditions for digitalisation of small and medium-sized enterprises in Bulgaria**

The second chapter examines the nature and role of SMEs in the Bulgarian economy and the digitalization processes taking place in them. Their activity has been analysed from the point of view of basic macro and microeconomic indicators, as well as by selected sectors in view of the conditions for installing POS and accepting card and other electronic payments.



### **2.1. Nature of small and medium enterprises in Bulgaria**

SMEs are the most widespread type of enterprises in Bulgaria. They protect competition, promote the development of entrepreneurship, increase product quality and lower prices, create a wide range of products for customers. They make a significant contribution to the overall growth of the economy, to the creation of jobs, as well as to the introduction and increase of electronic payments. The European definition of SMEs, adopted in the Bulgarian legislation, was examined.

### **2.2. Regulatory framework and policies for the development of small and medium-sized enterprises**

The European regulatory framework is broad and contains numerous policies regarding the functioning of SMEs. It refers to essential problems such as competition, taxation, state aid, access to financing, promotion of entrepreneurship, etc. The Bulgarian regulatory framework follows the European regulatory model. The main act is the Small and Medium Enterprises Act (State Gazette, No 84, 24 September 1999). It regulates the conditions with which the categories of micro, small and medium-sized enterprises, the bodies implementing the SME promotion policy, the measures, and programs for the promotion of SME activity should comply.

### **2.3. Macro and microeconomic indicators measuring the activity of small and medium-sized enterprises.**

Macro and micro-economic indicators that measure the degree of development of SMEs and influence the introduction, use and increase of the share of electronic payments are: the total number of SMEs in the country and in individual groups (small, medium and micro enterprises) and the persons employed in them; the newly established and closed SMEs; added value creation; annual turnover, income and expenses; investment policy. The statistical and comparative analysis of the above-mentioned indicators show that Bulgaria is in the group of EU countries with a relatively underdeveloped economy, despite the growth after 2017 until 2020, positive dynamics are observed in the number of all categories of SMEs, their added value, employment, income of SME, investment in fixed assets. The growth of Bulgaria according to these indicators in 2019 exceeds the average European values and the country is in second place in the EU in terms of growth rate of the added value of SMEs. The growth of Bulgaria according to these indicators in 2019 exceeds the average European values and the country is in second place in the EU in terms of growth rate of the added value of SMEs. Bulgaria is among the countries where the number of newly registered businesses has decreased since 2017. However, most of the considered indicators remain below the average values for the EU, and in terms of the number of start-up SMEs, Bulgaria is at the bottom of the European ranking.

Bulgaria is among the countries whose SMEs have suffered the biggest reductions in turnover during the two years of the COVID 19 pandemic.

These results reveal the significant backwardness of Bulgarian SMEs in the main economic indicators compared to the other member states, which reduces their competitiveness and their economic growth.

The backlog is one of the main obstacles to the introduction and wider use of electronic payments, as they are linked to investments. In this way, one of the aspects of the main thesis of the



dissertation is highlighted, that electronic payments require a higher level of technological development of SMEs, which will lead to higher competitiveness, as well as to a greater contribution to the economy.

In view of the study of the state and trends in the field of card payments in Bulgaria, a selection of SMEs was made for the needs of the dissertation work, as far as not every economic activity implies the need or possibility of using such a payment instrument. The dynamics for the period 2018-2019 were analysed in the following sectors: trade; hotels and restaurants; financial and insurance activities; professional activities (legal, accounting, consulting services, etc.); tourist and tour operator activity; health and social work; hairdressing and beauty services industry and other services.

The results show that as of 2019, there is a slight positive trend of growth in the number of enterprises in the selected sectors with conditions for card payments. During the COVID 19 pandemic in 2020, the sectors whose demand for goods and services was growing – health care, hairdressing, and other services, and partly insurance and financial activities – proved to be sustainable. Tourism and the hospitality industry were most affected, followed by commercial enterprises and professional services. The pandemic had a devastating effect on some micro- and medium-sized enterprises in the field of trade, while the small ones grew. The results show that under normal conditions the market for card payments with POS capabilities is growing, with an increase observed in crisis situations (the COVID 19 pandemic) in certain sectors when the demand for some services or goods increases. This is evidence in support of the second argument of the dissertation and the main statement that, despite the lagging behind of the main macro- and microeconomic indicators, there are prerequisites and conditions for the expansion of electronic payments in these sectors and for shedding light on the cash flows. Similar results were seen in the study of the change in number of SMEs in the selected sectors by annual turnover.

In the period 2018-2019<sup>13</sup>, the largest number of SMEs from the selected sectors with importance for increasing card payments registered an **annual turnover of up to BGN 20,000** (over 33% of the total number of SMEs in the sample), but their number is decreasing in all considered sectors, except for hairdressing and beauty services and wholesale and retail trade of motor vehicles. The most significant decline was observed in the wholesale trade (9.2%) and in the human health care services.

The group with a **turnover of BGN 20,000 to 50,000** stands next in importance and includes 31% of the SMEs selected in the sample, and in most sectors an increase in the number of SMEs was observed. The most significant increase occurred in hairdressing and beauty services, financial and insurance activities, and professional activities.

Enterprises with an **annual turnover between BGN 50 and 100,000** were fewer in number but are rapidly developing and have grown by 5% in one year. Most of the selected sectors saw an increase, the largest being in hairdressing and beauty services, human health care, car trade, hospitality, and catering sectors.

The group with the highest **annual turnover – over BGN 100,000** constitutes over 1/5 (22.6%) of all SMEs in the sample. In one year, they grew by more than 5% (or by 2382).

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<sup>13</sup> The analysis covers data for 2018-2019, as data for 2020 is not available.

The smallest is the group of SMEs with zero annual turnover (about 4% of SMEs in the selected sectors). The drop in it is a total of 0.9% and is a sign of the transition of the SMEs into the groups with a registered annual turnover or of termination of the activity. The results show that, in general, the number of enterprises with conditions for card payments with a higher annual turnover (from 20,000 to over 100,000) is increasing, while the number of enterprises with zero turnover and up to BGN 20,000 is decreasing. Such a process supports the second working hypothesis of the dissertation research, as well as the main thesis of the dissertation by proving that there is a developing market, representing an objective precondition for the expansion of card payments.

#### **2.4. Digitalisation and small and medium enterprises**

The research shows that the digitization of SMEs is an important precondition for the expansion of electronic payments. To implement and use them, SMEs must introduce information technologies, including those of a new generation, into their operations. In addition, they must ensure a reliable connection and the ability to work in an Internet environment, install smart devices through which to make payments, specialized software allowing sales and purchases from a distance and in a virtual environment, the necessary security mechanisms to ensure the security of payments and personal data of users, etc. SMEs must decommission old technologies and business processes or integrate them with new ones.

One of the most significant changes for SMEs today is related to advances in the digitization of payment initiation, payment infrastructure and information. Digital payments no longer require the presentment of a physical instrument and can use digital or virtual card accounts that allow payment through digital portals, mobile apps, social networks, and APIs. Many of these innovations leverage existing card infrastructure as it provides a fast, reliable, and secure way for clearing and settlement payments. The new PayTech industry offers greater security and efficiency of digital payments and personalized payment services to SMEs, giving them access to offers tailored to their needs previously unavailable to them. This confirms that the offering and use of electronic payments and in particular card payments by SMEs are a process dependent on the degree of their digitization and the use of various digital tools.

The comparative analysis with other EU member states shows that the digitalisation of SMEs in Bulgaria is lagging behind. Regarding the use of computers and access to the Internet and to broadband Internet, Bulgarian SMEs reported high growth in the period 2010-2019, but the values for small SMEs remained below the EU average<sup>14</sup>. The situation is similar with the use of web sites and web sites with new functionalities that provide various digital services to users. Small businesses in Bulgaria again rank one of the last places in the EU, far below the European average, and in terms of the use of various social media by SMEs in 2019, it ranks second to last in Europe. The level of application of specialized software (for supply management and customer relations) by Bulgarian SMEs is also low, as well as online shopping by Bulgarian SMEs. SMEs also are lagging in the implementation of innovative technologies. Bulgaria is last in the EU in terms of purchase and use of cloud technologies by SMEs – the most used service by SMEs in the EU, as well as in analysing big data from any sources, which in Bulgaria is far below the European average rate.

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<sup>14</sup> The data used here and below are from the EU Annual Report on SMEs 2020/2021, where micro- enterprise data is not available.

The results show that the low degree of digitalization of SMEs is among the main reasons for the insufficient use of electronic and, in particular, card payments. This part of the dissertation research helps clarify the main thesis of the dissertation by identifying the conditions that hinder the expansion of electronic payments by SMEs. The development of e-commerce is a factor that brings significant changes for the SME sector and determines the expansion of electronic payments. Through it, competition, innovation, and the introduction of new business models are encouraged. Online trading has great advantages such as overcoming the limitations of access to cross-border trade, the many rules that retailers must comply with at the local level, restrictive requirements related to the size and location of brick-and-mortar stores, etc. Costs of personnel and of renting and maintaining commercial spaces are saved, lower prices and cheaper advertising are offered. As with the other indicators, Bulgaria shows a high growth rate of e-commerce among small and medium-sized enterprises (in 2019 compared to 2010) and maintains 9th place among EU member states, but nevertheless remains among the countries with lowest level of development of online trading, as well as in terms of share of online trading compared to other EU countries. During the period of the COVID-19 pandemic, looking for a way to survive, some of the Bulgarian SMEs managed to take advantage of the digitalization processes to create efficient supply chains, open new markets and create innovative business models, setting the stage for a real digital transformation. Industries such as food and health products, work from home essentials (laptops, tablets, screens, etc.), home workout equipment, items people need at home when they are quarantined (freezers, heaters etc.), personal care products, etc., despite logistics issues, have seen a sharp increase in online sales.

In this new competitive environment, the introduction of innovative electronic payment methods that provide greater security and convenience for the customer is essential. The growth of online commerce in Bulgaria in 2020-2021 is a positive sign that shows the presence of potential in this sector, but its low level compared to the average European levels is a hindering factor. Thus, the second main hypothesis of the dissertation was confirmed, namely that online trading is one of the prerequisites for increasing electronic payments. This contributed to a more complete and comprehensive clarification of the main thesis of the dissertation by revealing how and to what extent it is possible in Bulgaria to expand electronic payments by SMEs to achieve higher competitiveness.

## **2.5. Use of electronic payments by small and medium-sized enterprises**

So far, the focus of the EU, as well as in Bulgaria, has been the digitalisation processes of SMEs, but electronic payments by SMEs have not been the subject of in-depth study. Market experience shows that the adoption of electronic payments is key to stimulating and creating new business opportunities in the SME sector. Since the National Statistical Institute does not generate data on electronic payments made by SMEs, the overall dynamics of electronic payments processed through the RINGS and TARGET2-BNB systems were analysed for the needs of the dissertation. The results of the analysis showed that for the period 2016-2020 there was an increase in the number of payments processed through the RINGS system – by 5.6%, and in their value – by 41%. There were similar increases in average daily electronic payments through RINGS. Over the same period, electronic payments to participants in the TARGET2-BNB real-time gross settlement system grew by 5% and their value by 88.7%, with a pronounced decline in 2020. Average daily payments by TARGET2-BNB participants have also been rising and declined in 2020.

The almost double increase in the total value of electronic payments in TARGET2-BNB compared to payments through RINGS at a similar rate of growth in the number of payments through both systems indicated a significant growth in the volume of individual electronic payments through this system.

The results of the dynamics of electronic payments through the RINGS and TARGET2-BNB systems confirmed the main thesis of the dissertation, proving that in Bulgaria electronic payments are expanding their scope of application both in terms of number and volume. The trend in the number of **debit cards** issued during the five-year period under review was downward with a slight downward trend. The trend in the number of issued **credit cards** was similar, the number of which decreased in 2020 by about 3% compared to the beginning of the period. Despite the slight decline in the number of credit and debit cards in the period 2016-2020, **card payments** in the country increased 2.3-fold (119%). The change in the volume of card payments during the considered period showed similar trends. Their value between the beginning and the end of the period also doubled (103%).

During the five years under review, most card payments were made through physical POS terminal devices. Their number increased significantly by 136% in 2020 compared to 2016. The share of payments through POS prevailed and was in the range of 82-85% of all card payments, gradually increasing. The data regarding the value of payments through POS were similar. They have also doubled (102%) during the period. The number of card payments made via the Internet during the period also increased significantly, and their number in 2020 increased almost 2-fold (by 86.7%) compared to 2016. The increase in the value of payments via the Internet was also twofold.

The significant increase over the period in the number and volume of card payments, physical POS terminal devices and the number and volume of payments made through physical POS terminal devices showed that there are conditions for increasing sales and turnover of enterprises and their competitiveness respectively and confirmed the first and second working hypotheses of the dissertation research. In this part, the main thesis of the dissertation was checked and confirmed.

## **2.6. POS Terminals and ATMs**

The presence of POS terminals in SMEs, through which the business accepts card payments, is also one of the indicators of Bulgaria's readiness to offer, implement and expand various types of electronic payments and to accelerate the digitalisation of the sector. Now, NSI does not provide official statistics regarding the developed infrastructure for card and other innovative types of electronic payments in individual SMEs.

The available data (from the BNB) is based on various criteria, such as the number of merchants using POS, number of commercial locations (shops/sites) that use POS, total number of locations accepting card payments, etc. Their analysis provides an opportunity to assess the degree of readiness of Bulgarian SMEs to meet the high modern requirements in the field of competitiveness and consumer demand, as well as to introduce and use innovative payment solutions. For the period 2016-2021, the results showed a serious increase in the number of **retail outlets using POS** (29.3%) and the number of **legal persons using POS** (40.5%), as well as the number of POS (44.7%).

The ratio between the number of legal persons working with POS and the number of retail outlets with POS showed that the legal persons (merchants) introduced terminals for accepting card payments in one or more retail outlets owned by them.

During the entire studied period, one legal person accepting card payments had 1.7-1.6 retail outlets using POS. The ratio between legal persons accepting card payments and the number of POS terminal devices varies between 1:1.8 to 1:2. At the beginning, in the middle and at the end of the period (2016, 2019 and 2021), two POS terminals were available per merchant, in 2020 (the first year of the pandemic) - 1:1.8 POS per merchant, and in 2017 and 2018 – 1.9 POS.

The positive trend in the process of implementation and use of POS, as well as the fact that some merchants offer card payments in more than one of their retail outlets, is an indicator of growing interest in the use of payment cards and the expansion of electronic payments. It confirms the first working hypothesis of the dissertation research and is an important piece of evidence in support of the main thesis of the dissertation.

## **2.7. Digital Payments Index**

The Digital Payments Index (DPI<sup>15</sup>) testifies to the comprehensive and complete clarification of the state of electronic payments in SMEs and the readiness of Bulgarian entrepreneurs to expand their field of application. It is issued annually and provides a comprehensive view of the digitalisation of consumer payments in Bulgaria<sup>16</sup> and shows the extent of the use and expansion of electronic payments by SMEs. The index shows an infrastructure that is well developed and provides a good basis for the digitalisation of consumer payments, but with values below the regional average. Consumer awareness of specific payment providers and new payment solutions is relatively low. Cash is considered the safest and second most convenient payment method (after contactless payment at POS terminals). More traditional electronic payment alternatives, such as account-to-account transfer, online payment by providing card details, etc., are also more widely accepted than more innovative solutions, such as payment with wearable payment devices, because the latter are considered less convenient and less secure.

It is expected that the role of cash will decrease in Bulgaria, as the share of people who receive their income through digital payment instruments will increase.

This information supports the first and second working hypotheses and confirms the results obtained and presented in the dissertation research regarding the willingness of Bulgarian SMEs to expand the use of electronic payments at the expense of cash and thus to attract more customers, increase their technological level and competitiveness.

## **2.8. Innovative solutions and prospects for developing electronic payments in Bulgaria.**

The use of innovative solutions in the field of payments such as mobile wallets, tokenization, biometric verification, virtual POS, etc., as well as the emergence of new business models based on electronic payments to provide SMEs with an easy and seamless transition to online stores and new platforms and digitize their payments, proves the main thesis of the dissertation, namely the

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<sup>15</sup> From English Digital Payment Index, a 2022 study by Mastercard

<sup>16</sup> Since such measurements are hardly available, the index provides an annual and comparable calculation by quantifying the development of the market in Bulgaria on a scale of 0 to 100, and comparing it with other participating countries – Austria, Croatia, Greece, Hungary, Romania and Serbia. Mastercard survey data.

presence of serious progress in the expansion of electronic payments in some of the Bulgarian SMEs.

## **2.9. Conclusion:**

The results of the studies of the impact of the macro and microeconomic indicators of SMEs, the trend in electronic payments, the digitalisation indicators, and the card payments market in the second chapter of the dissertation showed that in Bulgaria there are conditions for expanding the scope of application of card payments.

There is a developing market with conditions for POS, a part of which remains stable even in crisis situations. There is a positive dynamic of electronic payments through the RINGS and TARGET2-BNB systems, a significant increase in the number and volume of card payments, physical POS terminal devices, as well as the number and volume of payments made through them, which is an indicator of an increase in sales and turnover of enterprises.

On the other hand, the expansion of electronic payments has been slowed down by the substantial lagging of Bulgarian SMEs in the main micro and macroeconomic indicators, as well as by the still insufficiently developed processes of digitalisation and implementation of innovative technologies compared to the average European levels, due to a lack of enough investments and sufficiently targeted government policies and systems of incentives.

## **3. Third chapter: Main problems and challenges facing the development of electronic payments in Bulgaria**

**The third chapter** analyses the results of the conducted empirical research on the effects of using electronic payments on SMEs, the factors that determine them, the problems, and the measures to overcome them. A theoretical model has been created for the impact of electronic payments on the Bulgarian economy and, more specifically on tax revenues – excise duties and VAT.

### **3.1. Investigating the effects on SMEs of the increase in electronic payments**

#### **Methodological foundations of the research**

Due to the insufficient official statistics published by the NSI regarding the presence of POS and electronic payments by SMEs, an empirical survey was carried out in the dissertation regarding the adoption of electronic payments and their effects on enterprises, as well as the factors that influence this process. The econometric method was also used to study the effects on SMEs of the increase in electronic payments (tax revenues). Thus, the combination of the potential of different methods – statistical, empirical, and econometric allows to investigate the object of the study comprehensively and fully and to use it in future research by comparing the process during different periods and evaluating its benefits.

The survey was conducted during the period 1 January – 30 January 2022 among 600 respondents, owners, or managers of SMEs, in 600 enterprises by industry, specially selected in connection with the presence of conditions for installing POS. In relation to them, the sample is representative. In territorial aspect, the sample is structured in 6 strata: one stratum each for the 5 largest cities in the country (Sofia, Varna, Burgas, Stara Zagora, Ruse), and the 6th stratum for all other smaller cities

and villages. Chi-square ( $\chi^2$ ) analysis was used to assess the presence of relationship between the different variables.

### Main results of the empirical study

The results of the research showed that most of the studied companies (79%) already **accept payments by bank cards on POS** terminal devices, and only 6.2% stated that they do not accept any type of electronic payment.

Card payments on physical POS devices (74%) are the most used in the country, followed by bank transfers (16.3%). Thus, the first working hypothesis of the empirical study was confirmed, and the main thesis was verified and proven in this part. Despite the high level of adoption of card payments, their share in the total turnover of the enterprise is low - for half of the SMEs it ranges between 25% and 50%. This shows that **cash payments in SMEs are still the most used**. But there is a specific group of enterprises, representing more than 1/5 of the total number of SMEs, whose turnover from card payments exceeds 70% of their total turnover. In the big cities, there is a higher turnover of electronic payments compared to the other regions of the country. It is encouraging that 6.3% of SMEs now accept payment by bank cards over the Internet through a virtual POS, and 6% – both through a physical POS terminal and through a virtual POS.

This is an indicator of the beginning of a new, higher level of digitalisation of SMEs. Innovative solutions, such as mobile payments and card payments online through a virtual POS, have not yet gained a serious foothold in the country's payments market. They are offered by a small number of SMEs (respectively 0.5% and 3.8%). Thus, the second hypothesis of the empirical research was confirmed, that virtual payment instruments are popular among a small number of SMEs.

These results confirmed the conclusions made in the second chapter regarding the presence of positive trends in the field of the expansion of electronic payments and interest in new technological solutions. This supported the main thesis of the dissertation, that more and more SMEs become aware of the benefits of using electronic payments. However, part of SMEs is not yet ready to use card payments and **does not positively embrace digitalisation processes** in its activity. They do not intend to install a POS terminal device in the future.

The  $\chi^2$  analysis performed showed that there is no relationship between the reluctance to install POS and the distribution by strata. Among **the main reasons** for non-adoption is the lack of financial benefit due to high costs for the installation and maintenance of POS, which confirmed the 3rd hypothesis of the empirical study.

More and more SMEs become aware of the **benefits** of electronic payments. The most significant benefits are the improvement of competitiveness, the rationalisation and modernisation of enterprise processes and the reduction of operational tasks in cash management, the increase in sales revenue, because when paying by card, customers tend to buy more goods and more luxury items.

Respondents also see **other effects** on their enterprise from the introduction of electronic payments, and most of them are positive. Among them are the optimisation of accounting and management, an effect noted by nearly half of the respondents, the rapid and qualitative management of cash flows in the enterprise through easy and timely tracking of income and expenses and adequate management of profits and losses. Less than 1/5 of the respondents found negative effects such as higher requirements for the personnel and more complicated tasks.

**Regarding personnel**, the prevailing belief is that due to the speed and significant reduction of cash volumes, electronic payments ease the work of company employees and increase their productivity. But at the same time, there is a persistent attitude that this should not lead to an increase in the wages of employees. Based on this result, the 4th hypothesis of the empirical study is rejected.

The results prove the main thesis of the dissertation that most SMEs are aware of the benefits and positive effects of electronic payment adoption, as well as the fact that in this way the enterprise develops and expands, increasing its competitiveness and economic growth.

The main problems in electronic payment services, as well as the measures to overcome them, were identified for the complete and comprehensive clarification and proof of the main thesis of the dissertation. Technological issues such as poor technological or software equipment that causes failure and poor or no internet connection have been highlighted as the most significant **underlying problems** related to the expansion of e-payments by SMEs.

They confirm the conclusions made so far about the low level of digitalization of SMEs in Bulgaria, which increases the demand and makes higher-quality technological products more expensive in the field of payments. Due to a lack of funds for investments in this area, some micro-retailers are oriented towards older configurations. In addition, the still expensive fees for Internet access and insufficient support from providers, as well as the slow introduction of broadband Internet, hinder the processes of using modern technologies in many SMEs and generate the problems mentioned. Bulgaria's slow digitalization processes compared to other European countries is an issue that should be solved as a priority at the national level, as it is of great importance for business, especially for SMEs.

High bank service charges are also one of the serious problems for which government intervention can be crucial. Through appropriate policies, the government could boost competition between the banking and financial sectors in the provision of financial services to SMEs and thus offer a more affordable service charge for digital payments thanks to the increased volume.

Among the **measures** to expand the use of electronic payments, the most important for SMEs is the introduction of incentives and tax reliefs by the state for the installation of POS and acceptance of card payments as the most popular type of electronic payments at present. The high degree of approval of this measure (by more than half of the respondents) is an indicator of the impossibility of the small businesses to cope at this stage with the digitalization processes, which bring many benefits for the expansion and progress of their enterprises but are overwhelming for them without the intervention of the state.

The measure to provide free education and training programs and media campaigns to companies regarding financial services and solutions and the benefits of adopting electronic payments by businesses has also been relatively well accepted. This shows the need to broaden the horizons of the Bulgarian entrepreneur, especially regarding the opportunities available nowadays to get involved in the digitalization process, to get acquainted with the latest modern technological solutions and to learn to assess the value of their investments and their return on technological products for the development of their business. The introduction of reliefs by the state for users making a card and other electronic payments is not among the preferences of the respondents. Having more customers who want to pay with cards would give merchants an extra push to provide faster and better payment services, such as installing more POS terminals at the retail outlets, faster



customer service, easing cashiers' operations, reducing their responsibility and their work with cash, facilitating the cashier daily reports, etc. The increase in the number of customers who pay with cards also leads to greater attention from merchants to innovations and new technological solutions in the field of payments. Therefore, measures aimed at encouraging consumers to use card payments and other electronic payments would also have a positive effect on SMEs.

These results prove the main thesis of the dissertation that government support and incentives for SMEs are key to the expansion of electronic payments to increase their competitiveness and economic growth.

To provide complete and comprehensive support for the main thesis of the dissertation, the **main reasons** for helping or hindering the expansion processes of electronic payments were also investigated.

There is a **complex of factors**, the totality of which impacts positively or negatively the digitalization of SMEs in the field of payments. Among them are consumer demand and consumer attitudes toward using electronic payment instruments (33%), the low level of annual sales in most SMEs, which hinders the introduction of innovations (19.8%), and the shadow economy (10%). Thus, the third hypothesis of the dissertation research has been confirmed in its part regarding the influence of consumer behaviour and attitudes towards the use of electronic payments, and the influence of costs and service fees and the presence of unevenly developed regions in the country has been poorly assessed. In this part, the hypothesis was rejected.

**The shadow economy** is very closely related to electronic payments. Cash payments are in themselves a fuel of the shadow economy, as transactions can remain hidden by avoiding taxation, concealing illegal activity or assets, concealing the proceeds of criminal activity, even money laundering. The growth in electronic payments leads to a serious limitation of these negative phenomena in the economy and society.

**The shadow economy** is cited as one of the factors influencing the use of electronic payments (1/10 of respondents). Contradictory attitudes were found regarding the existence of a relationship between the adoption of electronic payments by SMEs and their participation in the grey sector of the economy with a slight prevalence of negative answers (56.5% of respondents).

Respondents tend to explain the reluctance of SMEs to introduce electronic payments with reasons not related to the grey economy, such as the lack of interest of the owners, as the state does not provide them with enough reliefs and incentives, with the presence of many SMEs on the threshold of survival, and the resistance to the regulations of the state, etc. However, a significant part – every second out of 5 respondents (over 41%) sees a direct link between the fact that SMEs do not introduce electronic payments and their possible participation in the grey sector and tax evasion.

The ranking of the grey economy by the respondents in the third place in the complex of factors and their opposite opinions regarding its relationship with the adoption of electronic payments by SMEs partially prove the 3rd hypothesis of the dissertation, and the main thesis in this part can be considered partially proven.

### **3.2. Financial Aspects of Increasing Electronic Payments by Small and Medium-sized Enterprises**

## Nature and importance of grey economy

In this part of the dissertation, the phenomenon of the grey economy, which has a negative impact on the expansion of electronic payments and on the overall economy of the country, was examined.

The shadow economy is a heterogeneous phenomenon and there is no generally accepted definition for it. The terms informal economy, black economy, shadow economy, grey economy, hidden economy, criminal economy, etc. are used as synonyms in economic theory and in the regulatory framework at the national and international levels. In the literature, the phenomenon is analyzed from the point of view of various social relations – fiscal, market, legal and statistical.

The dissertation research adheres to the EC definition that the shadow economy is an unreported economic activity associated with both registered and unregistered structures and activities. The terms grey economy and shadow economy are used interchangeably. The types of the shadow economy in the field of payments related to SMEs are described. Payment in cash is a very important negative factor for the shadow economy, as it allows the seller not to report the transaction, whereas with electronic transactions this is impossible. In this regard, there are two types of shadow economy – **monetary and non-monetary**<sup>17</sup>.

The *non-monetary* shadow economy is related to the domestic production of goods for its own use.

The *monetary* shadow economy covers the unreported economic activities related to monetary transactions. The monetary grey economy should include all the unreported economy, the hidden, unofficial, and illegal activities.

Depending on the value of unreported monetary transactions, two categories of monetary shadow economy are identified – **passive and active**<sup>18</sup>.

The *passive* monetary shadow economy is about cash payments that leave no electronic trail, are relatively easy to avoid reporting, and the merchant avoids paying taxes. In this type of shadow economy, the consumer is passive, does not benefit from the transaction not being reported and may not be aware that their payment remains hidden from the tax authorities. In the transaction in the passive grey economy, the seller (SME) is always registered. This type of shadow economy can be reduced either by measures to promote electronic payments or by increasing the share of registered transactions that are paid in cash. Similar payments are cash payments by the consumer in a restaurant, or for services where the seller does not register the transaction to avoid taxation without the consumer having any idea about it.

As for the *active* monetary shadow economy, the cash payment is not reported by the merchant to conceal illegal activity, tax evasion, or transactions of illegal products or services. In this case, however, both parties to the transaction are interested in using cash as a means of payment, so that the transaction is not recorded and remains hidden. The customer also has an interest in and agrees not to report the payment because he/she benefits from a lower price resulting from evading tax payments or acquiring illegal goods or services.

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<sup>17</sup> The types of shadow economy relevant to the field of payments are identified by Ernst & Young (EY), a European company that provides consulting, assurance, tax and transaction services, in a report entitled “Reducing the shadow economy through electronic payments”, <http://www.ey.com/pl/electronic-payments>.

<sup>18</sup> Reducing the shadow economy through electronic payments. <http://www.ey.com/pl/electronic-payments>.

Entrepreneurs take advantage of the shadow economy by saving costs that arise from the obligation to pay taxes, insurance, and fees, not reporting business operations and employment, or declaring lower turnovers, incomes, profits; obligations related to the employed personnel, working conditions, consumer protection, occupational health and safety, necessary licenses and permits, necessary professional qualifications, administrative costs, etc.

Saving such costs is a powerful incentive for SMEs to continue to accept mainly cash payments, without realizing that this reduces their competitiveness, their economic growth, and the efficiency of the economy as a whole. Therefore, it is necessary for government authorities to review and reduce some of these costs to prompt economic processes in SMEs in the field of payments to move from the shadow to the formal economy.

At the same time, some SMEs do not realize that operating in the shadow sector creates significant inconveniences for them. Such inconveniences are the costs associated with state control over their activities, for example, sanctions imposed on them, difficult access to funding and public services, the outflow of skilled labour, costs of creating false accounting, parallel accounting systems, etc.

The adoption and use of electronic and card payments impact many social phenomena arising from the shadow economy in Bulgaria. In terms of business, electronic payments eliminate illegal economic activity on behalf of unregistered legal persons (phantoms) and forms of illegal activities that suck out significant revenues from the state budget, the activity of planning and distribution of the volume of GDP is improved, deformations in the dynamics of economic growth are limited, conditions are created for a more secure business environment and attraction of foreign investments, market behaviour is developed, motivated by fair competition and profit.

For the employees, conditions are created for a safe and lawful operation of the work process in terms of salaries and social security of the workers; conditions for limiting and eliminating employment without a contract, unreported income, and operation of the illegal labour market; payment of health and social insurance, as well as compliance with the other rights of the employee. The impact of electronic payments on many processes in society arising from the shadow economy proves the main thesis of the dissertation that the effects of the expansion of electronic payments on SMEs, the economy and social processes are significant and efforts by the public sector to provide incentives in this direction would be beneficial.

### **Models to estimate the size of the shadow economy.**

Due to the great importance of the shadow economy as an obstacle to prosperous economic and social development, attempts are made to estimate its size to track progress and evaluate the effectiveness of the measures applied.

In this section of the dissertation, **various approaches** for estimating the size of the shadow economy are briefly presented. It is based on the common understanding that its measurement is a complex and ambiguous process, given the fact that it is essentially hidden, informal, unregistered, and there is a lack of official and reliable data and sources for determining its size. Usually, the size of the shadow economy is determined by analysing indirect indicators derived from official data of state institutions, using multiple approaches and empirical models. Therefore, there are no precise criteria for its assessment and methods are applied for its indirect measurement as a percentage of GDP. For this purpose, the period of measurement must be precisely justified, as

well as specific indicators must be selected, tailored to the particularities of the respective country. Thus, many authors are of the opinion that different methods and approaches, and even measurements using the same approach in different countries, are not comparable.

The characteristics of some commonly used methods were indicated, such as: measurement according to the amount of money in circulation, use of index methods that are based on deviation methods, use of econometric methods, etc. The Ernst & Young (EY) methodology was presented as it is focused on accounting for the impact that the increase in electronic payments has in reducing the shadow economy. What is new about this approach is that it separately assesses the monetary and non-monetary shadow economy, as well as the passive and active economy. The existing methods do not make such a distinction, and function as if GDP is only of monetary nature.

Through the overview of the main characteristics of the shadow economy in the field of payments, the 3rd hypothesis of the dissertation research was confirmed once again, that there is a close relationship between the shadow economy and electronic payment methods. In this part, the main thesis of the dissertation was checked and confirmed.

All the methods and their variations used so far for calculating the share of the shadow economy in each country have shortcomings that make them insufficiently precise and universal. The dissertation offers an econometric model for valuing the effects of bringing the shadow economy into the light when increasing electronic payments, considering the peculiarities of the Bulgarian economy. It proved the main thesis of the dissertation research, namely that the registration of more and larger transactions, carried out through electronic payments, shall lead to benefits for the economy, and in particular the increase in tax revenues – excise duties and VAT.

### **A theoretical model of the impact of electronic payments on the Bulgarian economy**

Given the fact that the use of electronic transactions reduces cash payments and brings cash flows into the light, for the purpose of the study, the following indicators of factors were selected from the collected information database:

- number of debit and credit cards;
- number of ATM type terminal devices;
- number of POS type terminal devices;
- number of credit transfers ordered by years;
- value of ordered credit transfers by years;
- number of card payments by years;
- value of card payments by years;

Given the results of the empirical study and other studies presented in the dissertation, and after assessing the availability of data, the indicator “revenues from direct taxes” was chosen as an outcome factor to determine the reduction in size of the shadow economy.

Data are available on:

- revenue to the state budget from excise taxes;
- revenue to the state budget from Value Added Tax (VAT);

Econometric modelling approaches were used to analyse the relationship between the volume of electronic payments and the tax revenues.

Two theoretical models have been analysed, describing the two indirect taxes – excise duties and VAT, as a function of the factor variables impacting them. Taxes were discussed in their dependence on the number of bank cards, ATMs, POS terminals, ordered transfers and card payments.

*Results for excise duty revenues:*

- A change in “Number of debit and credit cards” by 1% led to a 0.093% change in excise duty revenues respectively, while keeping other factors constant.
- A change in “Number of credit transfers ordered” by 1% led to a 0.002% change in excise duty revenues in the same direction, while keeping other factors constant.
- A change in “Value of card payments” by 1% led to a 0.22% change in excise duty revenues in the same direction, while keeping other factors constant.

*Results for VAT revenue*

The results of the performed correlation analysis showed that the factors with a significant influence on the values of “VAT revenues” (with a correlation above 0.5) were the following:

- number of POS devices;
- number of credit transfers ordered;
- value of credit transfers ordered;
- value of card payments.

*The results were as follows:*

- A change in the “Number of POS type terminal devices” by 1 unit led to a change of BGN 5,683 thousand in VAT revenues in the same direction while keeping other factors constant.
- A change in “Number of credit transfers ordered” by 1 million led to a change of BGN 13.79 million in VAT revenues **in the opposite direction** while keeping other factors constant.
- A change in the “Value of ordered credit transfers” by BGN 1 million led to a change of BGN 213.5 thousand in VAT revenues in the same direction, while keeping other factors constant.
- A change in “Value of card payments” by BGN 1 million led to a change of BGN 115 thousand in VAT revenues in the same direction, while keeping other factors constant.

The coefficient of determination in the VAT revenue model was significantly lower than that of the excise duties model.

This has its probable and logical empirical explanation. The realization of revenues from excise duties takes less time in relation to the moment of payment for excise goods, compared to the realization of revenues from VAT, in relation to the payment of taxed goods. This can be explained by the long procedure of calculating, deducting, reporting, and revising VAT, before the state budget realizes income from it.

This confirmed the expectation that the higher number and volume of electronic payments increase tax revenue (VAT and excise duties) and restricts the shadow economy, and thus the main thesis of the dissertation was checked and proven.

#### **4. Proposals**

The acceleration of the digitalization processes of SMEs, which is a precondition for expanding electronic payments and introducing innovative payment technologies, should be regulated and developed as a priority in government policy. An Electronic Payment Development Programme might be developed in SMEs, which should contain:

- Providing relief for SMEs when adopting electronic payments and innovative software payment products;
- introduction of measures and incentives to reduce or eliminate fees for access to high-speed Internet by SMEs and improve its maintenance;
- development of measures to encourage technological innovation and competition between the banking and financial sectors in the provision of financial services to SMEs, which will lead to a reduction of bank fees when providing electronic payments to SMEs;
- introduction of incentives and reliefs by the state for installation of POS and adoption and expansion of card payments as the most common type of electronic payments today;
- provide incentives and bonuses to customers who use electronic payments at retail outlets to make merchants focus on innovation and new technological solutions in the field of payments;
- training of the owners and managers of SMEs to introduce and use the available opportunities for inclusion in the digitalization processes; familiarization with the latest technological solutions in the field of payments to correctly assess the value of the necessary investments in technological products, their return, and the development of the business;
- provision of free educational and training programs and media campaigns to companies in connection with the offered financial and payment services and the benefits of introducing electronic payments, tailored to the demographic characteristics of Bulgarian SME owners and managers, the majority of whom are aged 35-55 years;
- development of a system of measures to reduce the tax obligations of SMEs when introducing and using electronic payments, which is proven by the dissertation research with the direct link between the growth in electronic payments and bringing the shadow economy into the light and the increase in revenues from VAT and excise duty taxes.

### **III. Conclusion**

The emergence of electronic payment systems is a phenomenon with significant economic, political, and social consequences. They are part of a new phenomenon – the digital transformation, which arises based on the expansion of technologies in all aspects of public life. The complete and comprehensive characterization of the subject – electronic payments, considered an essential element of electronic payment systems and in the context of the global process of digitalization and digital transformation, starts the process of laying the theoretical foundations of this insufficiently researched problem.

The dissertation research proved the main thesis that the introduction and use of electronic payments by SMEs, and in particular card payments, is of great importance both for increasing the

competitiveness and performance of the enterprise itself and its staff, as well as to the economy of the country.

The results of the research that prove the main thesis are as follows:

- **Availability of a developing market with conditions for POS in Bulgaria**, part of which remains stable even in crisis situations. This conclusion stems from the positive dynamics of the number and turnover of enterprises with conditions of use of POS, the number and volume of electronic and card payments, the number of physical POS terminal devices in SMEs and the payments made through them. This market is an essential precondition for the expansion of electronic payments.
- **Positive trends in the process of expanding electronic payments in SMEs**, which were also confirmed by empirical research. There is a high degree of acceptance of bank card payments by SMEs at physical POS, a group of SMEs (more than 1/5 of the total number) whose turnover from card payments exceeds 70% of their total turnover, the turnover of card payments in big cities is higher, the process of introducing payments through virtual POS devices has started.
- **Many benefits and positive effects for SMEs due to the expansion of electronic payments, which are directly related to economic growth and the increased competitiveness of SMEs.** The main ones are the following:
  - streamlining and modernizing processes in the enterprise and reducing operational tasks in cash management;
  - increasing sales revenue, since when paying by card, customers tend to buy more expensive goods;
  - facilitating operational processes and management;
  - fast and quality management of cash flows through simple and timely tracking of income and expenses;
  - adequate profit and loss management;
  - easing the work of company employees and increasing their productivity.
- **A significant incentive for bringing the shadow economy into the light and increasing tax revenues**, which was proven by the prepared theoretical model for the impact of electronic payments on the Bulgarian economy. There is a direct correlation between the change in the number of debit and credit cards, the number of terminal POS devices, the value of card payments and the number of ordered credit transfers, and the increase in **excise duty revenue**, i.e., an increase in each of these indicators lead to an increase in excise duty revenue and vice versa. Regarding **VAT revenues**, there is also a direct correlation between the change in the number of POS devices, the value of card payments and ordered credit transfers, i.e., an increase in each of these 3 indicators leads to an increase in VAT revenue and vice versa.
- There is an inverse relationship between the number of ordered credit transfers and VAT revenues – as the number of ordered credit transfers increases, VAT revenues decrease.
- The empirical research in the dissertation also identified the **negative processes** that prevent the expansion of electronic payments in Bulgarian SMEs. Among them are the lag in the main micro and macroeconomic indicators and in the indicators in the field of digitalization and the implementation of innovative technologies compared to the average European levels, as well as the still low level of e-commerce in Bulgaria. Among the factors negatively influencing the process of expanding electronic payments in SMEs are the

technological problems, the low number of annual sales in most SMEs, which makes the introduction of innovations unprofitable and contributes to the increase of the shadow economy.

#### **IV. Contributions of the dissertation**

- A complete characterization of electronic payments, considered an essential element of electronic payment systems and in the context of the significant global economic and social processes of digitalization and digital transformation, has been made, and the process of laying the theoretical foundations of this insufficiently researched problem has been started.
- Due to the lack of statistical information to explain and prove the main thesis of the dissertation, all available sources were used to research the object and subject of the dissertation research. Existing statistics in the field of electronic payments by SMEs were insufficient to prove the main thesis of the research. Therefore, along with statistical data, the methods of empirical research and econometric modelling were used to clarify and prove the positive effect of the expansion of electronic payments on SMEs and the economy as a whole. Thus, the combination of different research methods fully proved the main thesis of the dissertation. This methodology can be applied in future research on the topic, allowing to compare the process of expansion of electronic payments and its effects during different periods, to assess the benefits, problems, and negative aspects, as well as to formulate measures for further progress.
- The available market of card payments, meeting the conditions for POS in Bulgaria, was selected and its dynamics were tracked according to the indicators: number of SMEs by selected sectors and annual turnover.
- A statistical and comparative analysis of the digitalization of SMEs in Bulgaria compared to average European levels was carried out, since the offer and use of electronic payments and in particular card payments by SMEs is a process that depends on the degree of their digitalization and the use of various digital tools. A lagging was found in all the main parameters such as the use of computers, access to the Internet, use of broadband Internet, websites with modern functionalities, social media, and specialised software, including innovative technologies.
- The dynamics of electronic payments for the period 2016-2020 of terminal POS devices, retail outlets, and legal persons working with POS were studied.
- The rate of adoption of electronic payments by SMEs, and the benefits for them and for the staff were studied. The problems and factors affecting the introduction and use of card payments were outlined.
- A theoretical model was created for the effect of electronic payments on the Bulgarian economy, through which it was proven that card payments have a significant effect on the economy and, in particular, on tax revenues – excise duties and VAT.
- Recommendations to the state institutions and governments to create a program of incentives and measures to expand the scope of electronic payments in SMEs.



## **V. List of publications**

- Genova, T.** (2023). Payment Instruments and their usage in SME segment – Benefits and Challenges
- Genova, T.** (2023). Franchising as a business model - Definition and Advantages
- Genova, T.** (2023). Digitalization as a precondition for sustainable development of SMEs in Bulgaria, magazine “Money and Culture”, No. 1, pp. 66-80, collection of reports Economic challenges facing Bulgaria (2021-2023) – sustainability and risks, pp. 385-398