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Cryptocurrencies and Other Forms of Payment in the Awareness of Poles: Declared Trust, Perceived Risk and Actual Victimization

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Abstract:

Purpose: *The aim of this article is to examine the volume, trust and risk perceived by Poles in terms of broadly understood types of payments, from cash, through various electronic payments, to cryptocurrencies. This is particularly important in the context of the hypothesis of a cashless societies predicted by some researchers.*
Approach/Methodology/Design: *The method of computer-assisted telephone interviews (CATI) was used to achieve the research objectives. The study was conducted on a nationwide sample of N=1001 adult Poles (18+). The analyzes used descriptive statistics and explored a statistical method called two-stage cluster analysis.*
Findings: *A comparison of the results of foreign research and our own research and other Polish research clearly shows that Poles belong to the societies most dependent on cash payments; below the global average use electronic payments and cryptocurrency payments. These barriers are mainly awareness-raising and, to a lesser extent, technological. This is indicated by the discrepancy between high levels of concern and low levels of actual crime victimization in the use of different payment methods. In addition, groups in the technological vanguard (using a wide range of electronic payments, including cryptocurrencies) and digitally excluded groups (using traditional payment methods or card payments) were identified (in social, demographic and psychographic categories).*
Practical implications: *Identification of the extent of use, trust, perceived risk and actual victimization associated with different payment methods allows for the formulation of awareness, education and remedial actions on policies for implementing a cashless society. In addition, the article refers to the need to ensure security in the field of payments to citizens, especially those who are informationally excluded.*
Originality/Value: *This is the first study on a nationwide sample of adult Poles that reveals volume, trust and likelihood of victimization of various payment systems.*

Keywords: *Methods of payments, victimization, fear of crime, cryptocurrency, demographic factors.*

JEL codes: *K49, C51, Z00.*
Paper Type: *Research paper.*

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1. Introduction

This article is an attempt to answer the question about local, i.e., Polish, trends in the preferences of consumers of various payment methods. We are interested in payments using cryptocurrencies *versus* payments using other payment methods and payments using cash *versus* electronic payments.

Meta-analyses show that the key factor determining the development and popularity of specific payment methods are two closely related factors, trust in a specific payment metohod and the perceived risk associated with the use of such a payment system, expressed by the degree of fear of crime victimization and/or actual victimization (Chellappa and Pavlou, 2002; Cotteleer *et al.*, 2007; Herzberg, 2003; Liu, Ben, and Zhang, 2019; Tsiakis and Sthephanides, 2005).

It is worth placing the issue of payment methods and their use by ordinary users in a broader context. The factor that most transforms the way people use money, diversifies these ways and creates new payment channels is technological innovations (Petralia *et al.*, 2019). It is now a huge market bearing the names PayTech and FinTech, with a size of $240 billion (Credit Suisse, 2021).

The COVID-19 pandemic has accelerated changes in payment systems, changing the way people perceive the use of devices connected to the Internet for shopping, in particular mobile devices (CCAF, 2022; Belgavi, 2020; Rovan *et al.*, 2020). The intensive development of digital payment systems has led some authors to formulate a hypothesis about the transformation of modern societies into the so-called cashless societies. This hypothesis is most often formulated at the local, i.e., national, level (Bálint, 2019; Käll and Lagerkvist, 2022; Kitamura, 2022; Mokhtar, 2019; Pintér, 2022; Raya and Vargas 2022), less at the global level (Bátiz-Lazo, Haigh, and Stearns, 2016; Fabris 2019).

At the same time, the digital payment landscape is strongly shaped by the phenomenon of cryptocurrencies (Sousa, 2022). Despite the current difficulties of this market, its total capitalization is over $773 billion (as of December 27, 2022) (Trading View, 2022). The results of the meta-analyses of the literature on the subject prove that cryptocurrencies can potentially pose a threat to the banking sector, and even more broadly to the financial sector, and thus violate the existing political order as well as internal and international security.

The appeal of cryptocurrencies is based on the fact that they offer consumers lower transaction costs, higher efficiency, potentially greater security and privacy of transactions, and even no tax burden (Rejeb, Rejeb, and Keogh, 2021). In the light of the above facts, the question posed by Friedrich Hayek in the book entitled *Denationalisation of Money* (1976) whether the world is moving towards free competition between private currencies.

The same problem was considered several decades later by Benjamin J. Cohen (1998; 2001; 2004), predicting the increasing role of electronic money independent of state institutions. Such money, according to Cohen, can undermine the sole control of states over the money supply and, subsequently, the ability of these states to manage their economies through monetary policy, despite formally maintaining monetary sovereignty.

Electronic payments made by ordinary consumers are the subject of numerous empirical studies in Poland (Błach and Klimontowicz, 2021; Iwańczuk-Kaliska *et al.*, 2021; Narodowy Bank Polski, 2020; 2021; Gemius, PBI, IAB 2022; E-Service, VISA, 2022), however, are not included in these simultaneous cryptocurrency studies, which gives an incomplete picture. This is market and marketing research rather than academic research.

Moreover, if the volume and dynamics of electronic payment forms are studied in Poland, such measurements are not linked to the aspect of crime victimization. The fact of including cryptocurrencies and taking into account negative experiences in the form of victimization is an original element in our study. Being aware of the heterogeneity of the Polish society, the question of differentiation of use, fears, victimization in relation to means of payment was also asked by segmentation.

2. Materials and Methods

In order to examine the scope and content of the methods of payment made by Poles, a quantitative empirical study entitled *Social perception of new crimes related to electronic payments* was carried out. The study was conducted by the Association of Political Science Graduates affiliated with the Faculty of Political Science and International Studies at the University of Warsaw.

The research was financed by the Justice Fund administered by the Minister of Justice. Data collection took place between 5 and 25 October 2022 using the computer-assisted telephone interview method on a representative (gender, age, size of the place of residence and education) sample of N=1001 adult (18+) Poles. The measurement, fulfilling the requirements of the so-called statistical representativeness, can be generalized from the sample to the population of adult Poles.

The maximum standard error of the estimation was ±3.1%. Sampling was made with the use of the method ensuring the randomness of sampling, developed as part of US state methodology of quantitative research (and widely adopted in research practice). The procedure was developed by Warren Mitofsky and Joseph Wakesberg. It is referred to in research practice as Random Digit Dialling (RDD) (Wakesberg, 1973).

The following fifteen types of payments known in Poland (which was established on the basis of a literature study and a pilot study) were taken into account*: Cash,*

Transfer at the post office or bank branch, "Physical" payment card (debit/credit/prepaid) [contactless at the POS terminal or swiped by the POS terminal reader], Transfer via electronic banking through a web browser, Transfer via e-banking using an application provided by banks (usually on the phone), Online transfer using payment card details (card number and CVV/CVC code), Electronic Wallet (PayPal, Google Pay / Apple Pay, Neteller, Skrill, Masterpass, Visa Checkout, Cellum, Cash App), Multi-currency card (Revolut, Wise, N26, Cinkciarz, Monese, ZEN), Pay-by-link payments, fast e-transfer (PayU, Przelewy24, Dotpay), BLIK, Direct Billing, PaySafeCard (prepaid card), In-app payments for tickets and parking (mPay, SkyCash, moBILET) and other services (rental of vehicles: scooters, bicycles, cars), SMS payment, Cryptocurrency payments.

Each of the above-mentioned services was examined according to the following three aspects:

1. The **activity aspect**, i.e., the use of a specific payment service. Two indicators were taken into account. First, whether or not he is currently using the service. Secondly, it was examined what percentage of the total number of transactions is currently performed using this method;

2. The phenomenon called **fear of crime** in the literature (Hale, 1996), i.e., the fear of becoming a victim of crime as a result of displaying specific characteristics or specific activity, in this case using a specific payment system. The measurement was made on the following ordinal scale (the orderliness of the scale is present in the first four items): Not at all afraid, Rather not afraid, Somewhat afraid, Very afraid, I know the service but cannot determine the degree of concern, I do not know the service and cannot determine the degree of concern;

3. The **victimization aspect**, i.e., the fact that the respondent has ever been a victim of a crime related to a given form of payment. In particular, the correlation indicator between the degree of activity and the level of victimization experienced with the use of a given service was significant, which indicates the degree of security of the service. This is a subjective element concerning the sense of experienced crime, not the fact that it objectively took place in formal and legal terms; we are aware of this fact.

In order to present the results numerically, the methods of descriptive statistics were used. In turn, the cluster analysis was used to identify group differentiation within Polish society. Cluster analysis is a group of diverse statistical techniques used to classify cases into groups that are relatively homogeneous within themselves and heterogeneous among themselves. These groups are called clusters. Specifically, Two-Step Cluster analysis, was used. This analytical technique has particularly useful features: the ability to construct a model using both interval and nominal variables, and it allows the analysis of databases with large numbers of units of

analysis. The input data finally selected for the segmentation performed were the 15 payment behaviours of users – from cash to cryptocurrencies.

3. Results

Table 1 presents the cumulative results of the empirical study. Percentage of users in the population (the second column of the table) contains the percentage of people who declared that they use this method of payment. The third column "Percentage of transactions made" contains information on the average percentage of transactions made via a given payment channel among the entire population of adult Poles.

It means that the indicated percentage of cash from all transactions flows through this channel. The fourth column entitled "Fear of Crime" contains the summed percentages of answers "I'm a little afraid" and "I'm very afraid of it" to the question whether the respondent is afraid and what is the degree of these fears, that he may fall victim to a crime if he uses a given payment channel.

The last column "Percentage of victims in the population" provides information about the actual (declared by the respondent) victimization that occurred while using a given payment channel. These are affirmative or negative indications to the question of whether the respondent has ever become a victim of a crime when using a given payment channel.

Table 1. *Payment methods, volume, fear of crime and actual victimization among adult Poles.*

Methods of payment	**Percentage of users in the population**	**Percentage of transactions made**	**Fear of Crime**	**Percentage of victims in the population (in population of users)**
Cash	88.2	26.99	20.1	7.6 (8.6)
Transfer at the post office or bank branch	17.6	5.33	7.5	0.6 (3.4)
"Physical" payment card	79.6	35.54	28.3	6.7 (8.4)
Transfer via electronic banking through a web browser	46.6	11.41	33.1	2.7 (5.8)
Transfer *via* e-banking using an application provided by banks	21.3	5.84	28.3	0.3 (1.4)
Online transfer using payment card details	14.7	4.56	24.5	0.8 (5.4)
Electronic Wallet	12.0	1.33	39.7	0.9 (7.5)
Multi-currency card	6.7	2.04	19.9	0.0
Pay-by-link payments	20.7	4.38	19.9	0.2 (1.0)
BLIK	10.8	1.41	18.3	0.2 (1.9)

Direct Billing	3.1	0.57	11.7	0.1 (3.2)
PaySafeCard	0.5	0.03	13.6	0.0
In-app payments for tickets and parking and other services (rental of vehicles)	1.5	0.20	12.2	0.4 (26.7)
SMS payment	6.5	0.35	10.2	0.0
Cryptocurrency payments	0.4	0.02	13.8	0.1 (33.3)

Source: *Own study.*

Activity in the use of various payment methods among Poles. Among Poles, the following five payment methods are the most common: cash (88.2%), physical plastic card (79.6%), transfers *via* electronic banking performed on a desktop computer or laptop (46.6%), transfers *via* the application of the bank in which the respondent has an account (21.3%) and pay-by-link/e-transfer online transfers (20.7%). The largest volume of transactions is generated by three payment services: payment with a physical plastic card (35.5%), cash (26.9%) and transfers made *via* online banking in the browser of a desktop computer or laptop (11.4%). From the point of view of the frequency of use, the other services are of little importance.

Fear of crime in relation to various payment systems among Poles. The greatest fears of Poles regarding the possibility of becoming a victim of crime are raised by an electronic wallet in a smartphone. Over a third of Poles (39.7%) are afraid of falling victim to a crime using this service. One third of Poles (33.1%) are also afraid of transfers *via* electronic banking using a browser. Services of concern also include: physical payment with a plastic card (28.3%), payment card transfer using an application provided by the bank (28.3%) and electronic payment using data from a plastic card (24.5%).

Victimization in various payment systems among Poles. The study identified two payment methods that were critical in terms of reported victimization. These are payments using cryptocurrencies and in-app payments for tickets, parking or other services. Victimization reaches a third of users (33.3%) and a quarter (26.7%) among users, respectively. The other payment methods examined have a low level of victimisation.

Social and demographic diversity of Poles in the use of various payment systems. The segmentation carried out using the cluster analysis method allowed to distinguish three groups (clusters) of payment users. The obtained segmentation results turned out to be statistically satisfactory as measured by the coherence and distinctiveness of the Silhouette coefficient. It takes values from -1 (very poor model) to 1 (excellent model). The value of the coefficient was 0.4 and, in accordance with the convention, the obtained result should be considered at least satisfactory.

The sizes of the three distinct groups are as follows. The first cluster, the most numerous, constitutes nearly half of the respondents, i.e. 42.9%. The second cluster is over one third of all respondents (36.2%). Every fifth of the respondents (21.0%) was qualified to the last, third group.

The first cluster, which can be described as ***Universals*** or ***Experimenters***. Users of most services from cash to cryptocurrencies are located here. We note a significant activity of respondents in the following payment services: electronic banking using an application provided by banks (on a smartphone) - 49.7%, pay-by-link (48.3% in this group), BLIK (25.2%), online transfers using payment card details (24.7%), multi-currency card payments (15.4%), SMS payments (15.2%), Direct Billing (7.0%), PaySafeCard (4.0%) %), as well as occasional use of in-app payments for tickets and parking, and cryptocurrency payments.

They are often the only users of the above-mentioned services, respondents from other groups do not use them. In this group, cash is used by 83.0% of the respondents, plastic payment cards by 86.9%, transfers *via* electronic banking in a web browser by 57.8%, transfers at the post office or in a bank branch by 12.8%. There is a visible predominance of young and middle-aged people (i.e., up to 44 years of age), residents of cities with more than 100,000 inhabitants, people with higher education and unmarried marital status prevail.

From the psychographic point of view, this group includes people with a slightly higher than average sense of security in terms of fear of crime. Working people and students are overrepresented. If they work, it is most often in the information or service sector, doing creative work. Among these people there is the largest percentage of supporters of new payment methods, especially cryptocurrencies. Among the respondents in this group, 96.5% have heard of cryptocurrencies, and 93.0% heard of Bitcoin.

Cryptocurrencies were or are owned by almost every tenth person classified in this group (respectively: 11.4% and 9.8%). Also here were those planning to buy cryptocurrencies (8.4%) and mining them – 3.3%. They are much more confident in their knowledge of cryptocurrencies (declared by almost half of the respondents – 49.4%).

The second cluster, who were called ***Indecisive minimalists*.** This group includes people who use a small number of payment methods: cash (87.6%), transfers using electronic banking *via* a web browser (58.8%) and transfers *via* the Internet using a payment card (11.0%). They do not use other payment methods and are therefore called "minimalists". In turn, the respondents in this group deserved the title of "undecided", because they intensively use both cash and electronic payment services. Their characteristics are not as accurate as in the first group. We find here an increased number of middle-aged and elderly people (over 44), people with higher and secondary education, married.

These are mainly employees of the service sector, with the largest percentage of entry-level employees and middle-level managers also located here. A large percentage of those in this group have heard of cryptocurrencies (89.2%) or Bitcoin (80.7%), none of them currently own cryptocurrencies or plan to buy cryptocurrencies in the future.

The third cluster, those who fall into this group have been labeled as ***Traditionalists*** or ***Marauders***, as these people are distanced from electronic payment systems. Everyone in this group uses cash, and more than half of them (57.6%) use transfers at the post office or bank branch. Only one in three of them (29.5%) uses a physical payment card. Other payment methods are not used in this group. We can see here a definite overrepresentation of men, mainly people over 55, living in rural areas, most often with vocational and secondary education.

Compared to the other two groups with the lowest income, these are people who perceive their financial situation the worst. If they work, they are generally manual workers in the agricultural or industrial sector. These people have the lowest sense of security related to crime, including financial crime. We note in this group the highest positive attitude towards religion, overrepresentation of people with right-wing views and unspecified views (neither left, nor right, nor center).

Those included in this group have the lowest knowledge about cryptocurrencies (only 69.5% have heard about them) and Bitcoin (only 50.5% have heard about it). None of them have ever owned cryptocurrencies. We note here the largest percentage of people who think that cryptocurrencies will fall because they are a financial pyramid (fraud) – as much as 39.0%.

4. Discussion and Conclusion

The prevalence of cash has been steadily declining for years, and the pandemic has accelerated this process. Despite global changes, Poland is one of the 10 European countries most reliant on cash. Among the global leaders of the cashless society, i.e., Norway, Finland, New Zealand and Switzerland, only 2% of transactions are made with cash, while in Poland, according to own research, this percentage is almost 27% (Merchant Machine 2022).

In addition, Poland is also not one of the cryptocurrency leaders. Only 5% of Poles owned cryptocurrencies in January 2022, while the global average was 10.2% (DataReportal, 2022). Own research confirms this result: possession of cryptocurrencies in the past was declared by 5.4% of respondents, while currently 4.2% of adult Poles confirm possession of cryptocurrencies.

Technological innovations are generally used in Poland almost exclusively by the young generation, i.e. people up to 34 years of age (a group defined as ***Universals*** or **Experimenters**), while middle-aged and older people remain digitally excluded and

will not independently and actively search for better and more comfortable payment methods.

A particular obstacle in using cashless payments is the distance of Poles towards electronic wallets expressed by fear of them in the context of cybercrime. It is recognized that the best way to reduce the use of cash is to enable non-cash payments using a mobile device (smartphone, smartwatch) using electronic wallets (currently there are over 5 billion accounts globally (Merchant Machine 2022). The high level of fear of electronic payments, combined with a low level of victimization, shows that this is mainly an awareness problem, and this factor is known to be crucial for choosing and using different payment systems (Chellapalli and Kumar, 2020).

Although cryptocurrencies remain legal in most European Union countries, numerous actions of EU and Polish institutions discourage the use of this method of payment. It is worth enumerating, among others, legal restrictions (5AMLD and 6AMLD directives tightening KYC/CFT registration and reporting obligations) and tax restrictions (up to 50% tax in some EU countries, 19% in Poland (Tassev, 2018)).

The reception of cryptocurrencies in Poland is also not favored by the high level of victimization by cybercrime (reaching one third of users), as well as numerous warnings formulated by the European Banking Authority and the Polish Financial Supervision Authority regarding the risks associated with cryptocurrencies (PwC, 2023). The ecological aspect related to the energy consumption of mining and cryptocurrency transactions is also not indifferent (Kohli, 2022).

The legal climate in Poland remains unfavorable due to its vagueness. In the article 2 paragraph 2 point 26 of The counteracting money laundering and financing of terrorism Act of 1 March 2018 the legal definition *of virtual currency* (a synonym of „cryptocurrency") which was based of presenting inclusive and exclusive cryteria of identification of this financial instrument.

According to these exclusive cryteria virtual currency is a digital representation of value that is not: legal tender issued by any bank, an international accounting unit (established by an international organization), electronic money, a financial instrument, a bill of exchange or a check (Journal of Laws, 2018).

Since year 2018 running a business in Poland which is based on an activity in the field of virtual currencies may only be conducted when an enterpreneur is present in the Register of activities in the field of virtual currencies. This register is being manager by the Director of the Tax Administration Chamber in Katowice.

There are several types of business activity which should be registered by that unit of tax administration in a situation when an economic entity wants to trade virtual

currenciese: exchange between virtual currencies and means of payment, exchange between virtual currencies, brokerage in types of mentioned exchanges, keeping accounts for authorized persons who can use virtual currency units (Izba Administracji Skarbowej w Katowicach, 2022).

Cryptocurrencies in Poland do not have the potential to create financial risk, weakening the ability of central banks to conduct monetary policy, undermining the role and influence of banks and other traditional financial institutions, and therefore the "cryptoization" scenario (Cochen, 1998) is not within the reach of Poles.

References:

Bálint, V., Beke, A., Tordai, H., Domokos, K. 2020. Állami számvev˝oszék, Kutatási jelentés Pénzügyi kultúra fejlesztési programok felmérése összehasonlító elemzés 2016-2020.

Bátiz-Lazo, B., Haigh, T., Stearns, D.L. 2016. Origins of the Modern Concept of a Cashless Society, 1950s–1970s. In: Batiz-Lazo, B., Efthymiou, L. (eds) The Book of Payments. Palgrave Macmillan, London. doi:10.1057/978-1-137-60231-2_10.

Belgavi, V. 2020. Redefining the FinTech experience: Impact of COVID-19. New Delhi.

Błach, J., Klimontowicz, M. 2021. The Determinants of PayTech's Success in the Mobile Payment Market - The Case of BLIK. Journal of Risk and Financial Management, 14.

CCAF, World Bank and World Economic Forum. 2022. The Global Covid-19 Fintech Market Impact and Industry Resilience Report. University of Cambridge.

Chellapalli, T., Kumar, D.V.S. 2020. Role of Customer Perceptions in the Usage of Electronic Payment Systems. International Journal of Scientific &Technology Research, 9(2).

Chellappa, R., Pavlou, P. 2002. Perceived information security, financial liability and consumer trust in electronic commerce transactions. Logistics Information Management, 15, 5, 358-368.

Cohen, B.J. 1998. The geography of money. Cornell University Press.

Cohen, B.J. 2001. Electronic money: New day or false dawn. Review of International Political Economy, 8(2), 197-225. doi:10.1080/09692290010033376.

Cohen, B.J. 2004. The future of money. Princeton University Press.

Cotteleer, M.J., Cotteleer, C.A., Prochnow, A. 2007. Cutting checks: challenges and choices in B2B e-payments. Communications of the ACM, 50(6), 56-61.

Credit Suisse. 2021. Payments, Processes and Fintech; If Software is Eating the World, Payments is Taking a Bite.

DataReportal. 2022. Digital 2022 Global Overview Report. https://www.slideshare.net/DataReportal/digital-2022-july-global-statshot-report-jul-2022-v02.

Dziennik Ustaw. 2018. Ustawa z dnia 1 marca 2018 r. o przeciwdziałaniu praniu pieniędzy oraz finansowaniu terroryzmu. Dz.U. 2018 poz. 723. https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20180000723/U/D20180723Lj.pdf.

E-Service, VISA. 2022. Postawy wobec form płatności. https://www.eservice.pl/hubfs/Attitudes_toward_payment_methods_report_POLAND_POL-1.pdf.

Fabris, N. 2019. Cashless Society – The Future of Money or a Utopia? Journal of Central Banking Theory and Practice, 8, 53-66. doi:10.2478/jcbtp-2019-0003.

Gemius, PBI, IAB. 2022. E-commerce w Polsce. https://gemius.com/api/downloadReport2022.php.

Hale, C. 1996. Fear of Crime: A Review of the Literature. International Review of Victimology, 4(2), 79-150.

Hayek, F.A. 1976. Denationalisation of Money. The Institute of Economic Affairs. London.

Herzberg, A. 2003. Payments and banking with mobile personal devices. Communications of the ACM, 46, 53-58.

Iwańczuk-Kaliska, A., Marszałek, P., Schmidt, K., Warchlewska, A. 2021. Ocena zmian na rynku płatności w Polsce. Raport Fundacji Warszawski Instytut Bankowości.

Izba Administracji Skarbowej w Katowicach. 2022. Pytania i odpowiedzi dot. rejestru działalności w zakresie walut wirtualnych. https://www.slaskie.kas.gov.pl/c/document_library/get_file?uuid=453737ee-e0e1-48e0-bd8e-22ae41c678ac&groupId=3559133.

Käll, M., Lagerkvist, J. 2022. The Cashless Society in Practice. Master Degree Project in Management. University of Gothenburg.

Kitamura, Y. 2022. A Cashless Society: Facts and Issues. In: Quest for Good Money. Hitotsubashi University IER Economic Research Series. Springer, Singapore. doi:10.1007/978-981-19-5591-4_7.

Kohli, V., Chakravarty, S., Chamola, V. Sangwan, K.S., Zeadally, S. 2022. An Analysis of Energy Consumption and Carbon Footprints of Cryptocurrencies and Possible Solutions. https://arxiv.org/pdf/2203.03717.pdf.

Liu, Z., Ben, S. Zhang, R. 2019. Factors affecting consumers' mobile payment behavior: a meta-analysis. Electronic Commerce Research, 19, 575-601. doi:10.1007/s10660-019-09349-4.

Merchant Machine. 2022. Cash Reliant Countries. https://merchantmachine.co.uk/the-countries-most-reliant-on-cash-in-2022.

Mokhtar, N.F. 2019. A cashless society: Perception of Malaysian consumers toward the usage of debit cards. International Journal of Accounting, 4(21), 91-100.

NBP. 2020. PayTech – innowacyjne rozwiązania na rynku polskim. Departament Systemu Płatniczego, Warszawa.

NBP. 2021. Zwyczaje płatnicze w Polsce w 2020 r. https://www.nbp.pl/systemplatniczy/zwyczaje_platnicze/zwyczaje_platnicze_Polakow_2020.pdf.

Petralia, K., Philippon, T., Rice, T., Véron, N. 2019. Banking disrupted? Financial intermediation in an era of transformational technology. Geneva Report on the World Economy, 22.

Pintér, Z., Nagy, M., Tóth, K., Varga, J. 2022. The Struggle between Cash and Electronic Payments. Economies, 304(10). doi:10.3390/economies10120304.

PwC. 2022. Global Crypto Regulation Report 2023. https://www.pwc.com/gx/en/new-ventures/cryptocurrency-assets/pwc-global-crypto-regulation-report-2023.pdf.

Raya, J.M., Vargas, C. 2022. How to become a cashless economy and what are the determinants of eliminating cash. Journal of Applied Economics, 25(1), 543-562. doi:10.1080/15140326.2022.2052000.

Rejeb, A., Rejeb, K., Keogh, J.G. 2021. Cryptocurrencies in Modern Finance: a Literature Review. Etikonomi, 20(1), 93-118. Doi:10.15408/etk.v20i1.16911.

Rowan, P. 2020. The global Covid-19 FinTech regulatory rapid assessment study. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3770823.

Sousa, A., Calçada, E., Rodrigues, P., Pinto Borges, A. 2022. Cryptocurrency adoption: a systematic literature review and bibliometric analysis. EuroMed Journal of Business, 17(3), 374-390. doi:10.1108/EMJB-01-2022-0003.

Tassev, L. 2018. 0 to 50% – Time to Pay Crypto Taxes in the European Union. https://news.bitcoin.com/0-to-50-time-to-pay-crypto-taxes-in-the-european-union.

Trading View. 2023. https://pl.tradingview.com/chart/?symbol=CRYPTOCAP%3ATOTAL.

Tsiakis, T., Sthephanides, G. 2005. The concept of security and trust in electronic payments. Computers and Security, 24, 10-15.

Wakesberg, J. 1973. Sampling Methods for Random Digit Dialling. Journal of the American Statistical Association, 73, 40-46.