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## ARE NON-CASH PAYMENTS THE SOLUTION TO LIMIT THE SIZE OF THE SHADOW ECONOMY?

### Abstract

**Background:** The research available in the literature shows that cash payments significantly determine the development of the shadow economy. In Poland, the size of the unobservable economy poses a challenge to the political and financial security of the state. The legislator is introducing solutions using digital technology and artificial intelligence (e.g., SAF-T, online cash registers, STIR, structured e-invoices) aimed at reducing activity in the shadow economy, which accounts for a significant part of the tax gap. As there is a large percentage of cash payments, these tools are not able to reduce its size significantly. Thus, it is necessary to promote and increase the number of non-cash payments, which should improve the analytical and control capabilities of tax services.

**Research purpose:** The purpose of the article is to identify the main causes of the shadow economy and how cash circulation contributes to it. The article ascertains whether the development of non-cash payments (increasing their number, value and share in the total value of transactions made) contributes to reducing the size of the shadow economy. The research goal has been achieved. However, despite the growth of non-cash settlements, the shadow economy has been growing steadily since 2020. The factors for its growth should be sought outside the sphere of payments.

**Methods:** The research was based on a search of the literature on the unobservable economy, its essence and main causes, and the paper cites research on reducing the shadow economy by promoting cashless payments. Data on non-cash payments in Poland – their number, value and share in the total value of transactions made – are presented and interpreted. They are juxtaposed with data on the level of the shadow economy in Poland. The paper is mainly supported by analysis of industry reports and data from the National Bank of Poland and the IPAG Institute Foundation.

**Conclusions:** Despite the increasing popularity of cashless payments in Poland, the size of the shadow economy has been growing steadily since 2020. This is mainly influenced by the

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deteriorating economy, which is a result of the COVID-19 pandemic and the war in Ukraine. In Poland, a large proportion of payments are still made in cash, which still provides ample room for hiding all or part of the business, especially during the economic crisis. It is recommended that cashless payments continue to be promoted along with the digitization of tax settlements.

**Keywords:** shadow economy, cashless payments, tax gap.

**JEL classification:** H21, H25, H32

## 1. Introduction

Transactions within the shadow economy are mainly carried out using cash, which leaves no trace in accounting records. They deplete revenue to the state budget due to their ease of use and the difficulty in tracking transactions paid for by this means. One can often hear in the public debate the thesis that cash circulation promotes the shadow economy and is used as a means of supporting crime.<sup>1</sup> There are calls for regulatory measures to restrict the use of cash and replace it with an electronic equivalent.<sup>2</sup>

Cashless trading leaves a lot of traces – primarily in banking systems, business records and registers to which the tax service has access. For this very reason, it can limit activity in the shadow economy.<sup>3</sup> Many European countries are promoting cashless trading in B2B and B2C transactions, while also introducing restrictions on the use of cash.<sup>4</sup> In Poland, where there is an apparent attachment to traditional payments, especially in B2C transactions, this may be a controversial solution.

The shadow economy contributes to the tax gap. Polish lawmakers are trying to fight it in many ways, but one of them is primarily the digitization of tax settlement.<sup>5</sup> Many solutions have been introduced to tighten the tax

<sup>1</sup> *Cash demand in the shadow economy*, Deutsche Bundesbank, 2019, <https://www.bundesbank.de/resource/blob/793190/466691bce4f27f76407b35f8429441ae/mL/2019-03-bargeld-data.pdf>; accessed: 2.12.2023.

<sup>2</sup> An electronic payment can be defined as a payment that is initiated, executed and received electronically (A. Borcuch, *Wpływ rynku płatności elektronicznych na ograniczanie szarej strefy*, *Finanse: czasopismo Komitetu Nauk o Finansach PAN* 2012/1 (5), p. 67).

<sup>3</sup> Z. Liptak et al., *Przeciwdziałanie szarej strefie w Polsce*, Global Compact Poland, Warszawa 2016, p. 15.

<sup>4</sup> T. Khiaonarong, D. Humphrey, *Measurement and Use of Cash by Half the World's Population*, IMF Working Papers 2023/WP/23/62, p. 2; *Cash payment: Cash limits in Europe*, <https://www.evz.de/en/shopping-internet/cash-payment-limitations.html>; accessed: 28.01.2024.

<sup>5</sup> A. Kowal, W. Lichota, *Proces cyfryzacji podatku VAT w Polsce*, *Studia Prawno-Ekonomiczne* 2020/CXV.

system using digital technology, SAF-T (Standard Audit File for Tax), the split payment mechanism, STIR (The IT System of the Clearing House), structured e-invoices and online cash registers.<sup>6</sup> However, as there is a high percentage of cash payments, these tools may be ineffective in reducing activity in the shadow economy. Thus, according to various studies, promoting and increasing the number and value of cashless payments may be key.<sup>7</sup>

The purpose of the article is to identify the main causes of the shadow economy. To this end, research linking the reduction of its size to the development of cashless payments has been reviewed, and the initiatives of the Polish legislator to combat activity in the shadow economy are presented, with a focus on the current strategy of limiting cash payments in B2B transactions. The research part presents data on non-cash transactions, i.e. their number, value and share in the total value of transactions in physical retail and service outlets. Data on the size of the shadow economy is also presented. The paper is mainly supported by analysis of industry reports and data from the National Bank of Poland (NBP) and IPAG Institute Foundation (IPAG – Instytut Prognoz i Analiz Gospodarczych). Based on the above observations, the following research hypothesis was formulated:

*H<sub>1</sub>. The development of cashless payments in Poland (increasing their number, value and share in the total value of transactions made) contributes to reducing the size of the shadow economy.*

## 2. The shadow economy as a result of cash circulation

The shadow economy is sometimes referred to in the literature as the unobservable, unofficial, unregulated, informal or hidden economy.<sup>8</sup> Meanwhile, interesting concepts were introduced by Dobovšek and Slak,<sup>9</sup> who used the terms *white informal economy* and *black informal economy*. The distinction is

<sup>6</sup> **A. Kowal-Pawul, G. Przekota**, *Importance of VAT digitization for income disclosure in section F-construction – a case for Poland*, *Journal of International Studies* 2021/14 (4), p. 71; **A. Kowal-Pawul**, *Ekonomiczne uwarunkowania i konsekwencje cyfryzacji podatku od towarów i usług w Polsce*, rozprawa doktorska, Uniwersytet Rzeszowski, Rzeszów 2022, p. 179.

<sup>7</sup> **A. Borcuch**, *Wpływ rynku płatności elektronicznych...*, p. 77; **EY**, *Reducing the Shadow Economy through Electronic Payments: Technical appendices*, Warszawa 2018, p. 34, [https://assets.ey.com/content/dam/ey-sites/ey-com/en\\_pl/topics/eat/pdf/03/ey-shadow-economy-study-technical-appendices.pdf](https://assets.ey.com/content/dam/ey-sites/ey-com/en_pl/topics/eat/pdf/03/ey-shadow-economy-study-technical-appendices.pdf); accessed: 2.12.2023.

<sup>8</sup> These terms will be used interchangeably in this work; **A. Lipczyńska**, *Wykrywanie nadużyć podatkowych. Prawo Benforda i Jednolity Plik Kontrolny*, Difin, Warszawa 2019, p. 71.

<sup>9</sup> **B. Dobovšek, B. Slak**, *Economic crisis and “white informal economy” – a slippery slope*, *International Journal of Sociology and Social Policy* 2017/37 (7/8), pp. 468–476.

based on the degree of tax avoidance. *The black informal economy* is a typical criminal activity, including tax fraud, while the *white informal economy* exploits loopholes to optimize taxation, although acts on the borderline of the law can also be recorded here. In this work, *the shadow economy* is understood as *economic and profit-making activities that remain outside the records and regulation of the state and the state fiscal apparatus*. It includes both revenue-generating activities undertaken in accordance with the law but not reported for taxation and activities on the borderline of the law, as well as illegal, criminal and even mafia activities.<sup>10</sup> This is in line with the approach presented by the European Commission, the Central Statistical Office, IPAG and the Polish Economic Institute.<sup>11</sup>

The shadow economy is an element of the tax gap (especially the budget-crippling VAT gap) with the exception of the black market area, which is part of real, albeit unobservable economic activity. However, the subject of transactions are illegal products, which, by definition, are not taxable under current law.<sup>12</sup> High levels of the shadow economy have significant economic and social impacts. Adverse effects include a reduced tax base, lower quantity and/or quality of public goods, and distorted market competition, thus undermining the state's financial security.<sup>13</sup>

The experience of European control and tax authorities, including Poland, indicates that the shadow economy is fostered by the free flow of cash associated with business transactions.<sup>14</sup> This position was also presented by Schneider and Williams,<sup>15</sup> as well as other authors and organizations. An obvious feature of

<sup>10</sup> A. Krajewska, *Podatki – Unia Europejska, Polska, kraje nadbałtyckie*, Warszawa 2004, p. 237.

<sup>11</sup> J. Fundowicz et al., *Szara strefa 2019*, Instytut Prognoz i Analiz Gospodarczych, Warszawa 2019, pp. 6–7; Polski Instytut Ekonomiczny, *Szara strefa w Polsce*, Policy Paper 2019/7, Warszawa 2019, p. 5; Z. Liptak et al. (eds.), *Przeciwdziałanie szarej strefie w Polsce*, The Global Compact Network Poland, Warszawa 2016, p. 43.

<sup>12</sup> A. Kowal-Pawul, *Ekonomiczne uwarunkowania...*, p. 149.

<sup>13</sup> EY, *Reducing the Shadow Economy through Electronic Payments*, 2016, p. 1, [https://assets.ey.com/content/dam/ey-sites/ey-com/en\\_pl/topics/eat/pdf/ey-report-2016-reducing-the-shadow-economy-through-electronic-payments.pdf](https://assets.ey.com/content/dam/ey-sites/ey-com/en_pl/topics/eat/pdf/ey-report-2016-reducing-the-shadow-economy-through-electronic-payments.pdf); accessed: 2.12.2023.

<sup>14</sup> A. Ćwiakła-Małys, I. Piotrowska, *Obniżenie limitu płatności gotówkowych jako element efektywnego ograniczania szarej strefy w Polsce*, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, p. 40.

<sup>15</sup> F. Schneider, *Shadow Economies of 145 Countries all over the World: What do we really know?*, CREMA Working Paper Series, Center for Research in Economics, Management and the Arts, Zürich 2005, p. 13; F. Schneider, C. Williams, *The Shadow Economy*, The Institute of Economic Affairs, London 2013, p. 20; M. Arsić et al., *Causes of the Shadow Economy*, in: G. Krstić, F. Schneider (eds.), *Formalizing the Shadow Economy in Serbia. Policy*

any activity in the shadow economy is the desire for anonymity, leading to the predominant use of cash between the parties to a transaction. The participants and beneficiaries of the informal economy avoid non-cash transactions, as they leave a trace in banking systems, payment systems, business records and accounting records.<sup>16</sup>

Among the factors that support the shadow economy, Schneider also cites the fiscal control apparatus, which does not function efficiently; therefore, there is a relatively low risk of detecting misconduct or irregularities.<sup>17</sup> Additionally, an International Monetary Fund report identifies low levels of monitoring and enforcement as a determinant of the shadow economy.<sup>18</sup> In addition, control authorities do not have real-time data and cannot react quickly and effectively to transactions that may indicate attempts to evade or defraud tax.<sup>19</sup> Cash payments do not promote transparency in the system of settlements between business entities, further hindering detection.

Many studies have investigated the link between the shadow economy and non-cash trade. An interesting study was conducted in Serbia,<sup>20</sup> where the shadow economy in 2019 amounted to about 33.5% of GDP. Bringing the level of cashless payments closer to the Central and Eastern Europe average could reduce the country's shadow economy by as much as 3.4% of GDP and increase additional tax revenues by about €700 million a year (1.35% of GDP). It is

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*Measures and Growth Effects*, Springer, New York–Dordrecht–London 2015, pp. 21–45; **OECD**, *Shining Light on the Shadow Economy: Opportunities and Threats*, Paris 2017, p. 16; **M. Hassan, F. Schneider**, *Size and development of the shadow economies of 157 worldwide countries: Updated and new measures from 1999 to 2013*, *Journal of Global Economics* 2016, Discussion Paper No. 10281, p. 8; **J. Harasim**, *Zwyczajne płatnicze konsumentów a możliwości ograniczenia obrotu gotówkowego w Polsce*, *Zeszyty Naukowe Uniwersytetu Ekonomicznego w Krakowie* 2015/2 (938), p. 18.

<sup>16</sup> **J. Fundowicz et al.**, *Szara strefa 2023*, Instytut Prognoz i Analiz Gospodarczych, Warszawa 2023, p. 20.

<sup>17</sup> **F. Schneider**, *Shadow Economies of 145 Countries all over the World: What do we really know?*, CREMA Working Paper Series, Center for Research in Economics, Management and the Arts, Zürich 2005, p. 13.

<sup>18</sup> **B. Kelmanson et al.**, *Explaining the Shadow Economy in Europe: Size, Causes and Policy Options*, IMF Working Papers, Washington 2019, p. 9.

<sup>19</sup> **A. Cwiakala-Malys**, *Obniżenie limitu płatności gotówkowych jako element efektywnego ograniczenia szarej strefy w Polsce*, *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu* 2017/480, p. 47.

<sup>20</sup> **S. Randelović, M. Arsić, S. Tanasković**, *The impact of an increase in cashless payments on the shadow economy and public finance in Serbia*, Foundation for the Advancement of Economics, Belgrade 2022.

estimated that with appropriate policy measures, this goal can be achieved within 6 or 7 years. The study noted that to achieve better and more lasting results, the development of cashless payments should be accompanied by improvements in the efficiency of tax enforcement. Other works have found that cashless trading, along with the digitisation of tax payments, helps reduce the shadow economy.<sup>21</sup>

Another study, based on an analysis of Central and Eastern European economies, found that a 1% increase in the total value of card payments at physical terminals in relation to GDP led to an average decrease in the passive shadow economy<sup>22</sup> of 0.037 percentage points of GDP<sup>23</sup> in the sample period. A study conducted by EY on eight European countries (Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Poland, Serbia, Slovakia and Slovenia) confirmed that a 100% increase in the value of card payments should lead to a reduction in the shadow economy in the countries analyzed by 0.6–3.7% of GDP and an increase in state budget revenue by 0.1–0.8% of GDP.<sup>24</sup>

According to a Bank of Italy analysis, a 1% increase in the share of non-cash payments results in higher VAT revenues by about 0.4% due to increased compliance.<sup>25</sup> Another study conducted in Greece based on 15 years of annual data, estimated that for every 1% increase in the use of card payments, there is a 0.24% increase in tax revenue.<sup>26</sup> Other researchers conducted an analysis covering 25 European Union (EU) countries and estimated that ten additional

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<sup>21</sup> **A. Yamen, A. Coskun, H. Mersni**, *Digitalization and tax evasion: The moderation effect of corruption*, *Economic Research-Ekonomika Istraživanja* 2023/36:2; **N. Varotsis**, *A Fiscal Policy Foresight Tax Model, Shadow Economy Reduction, and E-Payment Institutionalization as a Result of Knowledge Management*, *Theoretical Economics Letters* 2022/12 (6); **M. Sung, R. Awasthi, H. Lee**, *Can Tax Incentives for Electronic Payments Reduce the Shadow Economy? Korea's Attempt to Reduce Underreporting in Retail Businesses*, *Equitable Growth, Finance and Institutions Global Practice Group, Policy Research Working Paper* 7936.

<sup>22</sup> A passive gray market where cash is the cause of the shadow economy.

<sup>23</sup> **World Bank Group**, *Electronic Payments Acceptance Incentives Literature Review and Country Examples*, Washington 2020, p. 14.

<sup>24</sup> **EY**, *Reducing the Shadow Economy through Electronic Payments*, 2016, p. 73.

<sup>25</sup> **F. Berardini, F. Renzi**, *Banca d'Italia, Questioni di Economia e Finanza. Mind the Gap! The (unexpected) impact of COVID-19 pandemic on VAT revenue in Italy*, *Questioni di Economia e Finanza (Occasional Papers)* 2022/669, p. 6.

<sup>26</sup> **Foundation for Economic & Industrial Research**, *Digital payments and tax revenues in Greece*, 2015, p. 12, [http://iobe.gr/docs/research/en/RES\\_05\\_F\\_21102015\\_REP\\_EN.pdf](http://iobe.gr/docs/research/en/RES_05_F_21102015_REP_EN.pdf), accessed: 28.01.2024; **Deloitte**, *Economic impact of real-time payments, Research Report*, 2019, p. 42, <https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/financial-services/deloitte-uk-economic-impact-of-real-time-payments-report-vocalink-mastercard-april-2019.pdf>, accessed: 28.01.2024.

card transactions per capita per year reduces the VAT gap by between 0.08%, and 0.2% of GDP.<sup>27</sup>

An attachment to cash is evident in Poland. A report published by the National Bank of Poland *Zwyczajne płatnicze w Polsce w 2020 r.*<sup>28</sup> shows that cash was the most frequently indicated payment method. As the results of the survey show, in the 12 months preceding the measurement, it was used by 97.8% of respondents. This was followed by contactless payment cards at 75.6%. The circulation of cash payments in Poland in 2020 was 13.8% of GDP, compared to just over 1% in Sweden.<sup>29</sup>

According to EY estimates, in 2018, the total value of the shadow economy in Poland amounted to 10.8% of GDP (PLN 229 billion<sup>30</sup>). The cash shadow economy accounted for 9.9% of GDP (PLN 209 billion), of which the passive shadow economy<sup>31</sup> was responsible for 7.9% of GDP (PLN 168 billion). This means that the vast majority of Poland's cash shadow economy can be reduced by promoting cashless payments.<sup>32</sup> Whether this is actually the case will be resolved in the next chapter.

### 3. Should cashless payments be developed as a way to reduce the shadow economy?

Since the beginning of the systemic transition in Poland in the 1990s, various initiatives have been taken to reduce the size of shadow economy,<sup>33</sup> covering three areas: the development of tax receivables control tools, educational and preventive activities, and promotion of cashless payments.<sup>34</sup> Since 2016,

<sup>27</sup> **G. Immordino, F. Russo**, *Cashless Payments and Tax Evasion*, Centre for Studies in Economics and Finance, Working Paper 2016/445, p. 11.

<sup>28</sup> **R. Kotowski** (ed.), *Zwyczajne płatnicze w Polsce w 2020 r. Podstawowe wyniki badania*, NBP, Warszawa 2021.

<sup>29</sup> **NBP**, *Raport o obrocie gotówkowym w Polsce w 2020 r.*, Warszawa 2021, p. 9; **International Monetary Fund**, *Sweden. Selected issues*, International Monetary Fund, Washington 2021, p. 2.

<sup>30</sup> Here and hereafter, nominal values in 2018 prices.

<sup>31</sup> A passive gray market where cash is the cause of the shadow economy.

<sup>32</sup> **EY**, *Szara strefa w Polsce*, Warszawa 2020, p. 6, [https://assets.ey.com/content/dam/ey-sites/ey-com/en\\_pl/topics/cat/pdf/03/ey-szara-strefa-w-polsce-final.pdf](https://assets.ey.com/content/dam/ey-sites/ey-com/en_pl/topics/cat/pdf/03/ey-szara-strefa-w-polsce-final.pdf); accessed: 2.12.2023.

<sup>33</sup> **J. Fundowicz et al.**, *Szara strefa 2023...*, p. 19.

<sup>34</sup> **M. Pasternak-Malicka**, *Pozytywne i negatywne konsekwencje szarej strefy postrzeganej jako „zręczność podatkowa” podmiotów gospodarczych i gospodarstw domowych*, Zeszyty Naukowe SGGW w Warszawie. Polityki Europejskie, Finanse i Marketing 2020/24 (73), pp. 136–137.



tools have been introduced in Poland to build an effective system of control, management and analysis of data in real time, also using artificial intelligence (including SAF-T split payment mechanisms, STIR, and white lists).<sup>35</sup> Another initiative, Paragon Lottery (receipt lottery), was introduced in the fourth quarter of 2015. It prompts taxpayers to demand fiscal receipts from vendors.<sup>36</sup> The lottery aimed to make Poles aware of their role in fair business and show that taking a receipt means supporting honest entrepreneurs and fair competition between them.<sup>37</sup>

When promoting cashless trading, the Polish legislator imposed a limit on cash payments in B2B transactions, which currently stands at PLN 15,000.<sup>38</sup> Starting in 2017, expenses above PLN 15,000 paid in cash are not a tax expense.<sup>39</sup> As part of the Polish Order, the legislator announced changes to the limit of cash transactions between businesses, but also consumers (in B2C transactions). The changes were supposed to be introduced on January 1, 2023, although it was postponed to the beginning of 2024. According to the legislation, the limit of cash transactions in B2B transactions will be PLN 8,000, and in B2C transactions, it will be PLN 20,000.<sup>40</sup>

These changes may be perceived as possible excessive state fiscalism, but they are primarily driven by the need to adapt to global changes and international standards of economic and political security. Similar initiatives have taken hold in other EU countries. Greece has imposed a significant limit on cash payments in all transactions, at €500. The Italian government withdrew from the previously imposed €1,000 limit due to, among other things, the intervention of the Commission and the European Parliament; the limit is now €5,000.<sup>41</sup> In the eurozone, limits on transactions between legal entities and individuals still exist in Lithuania (€5,000) and Croatia (€10,000) among others. Limits for

<sup>35</sup> **A. Kowal-Pawul**, *Ekonomiczne uwarunkowania...*, p. 179.

<sup>36</sup> **M. Pasternak-Malicka**, *Pozytywne i negatywne konsekwencje...*, p. 137.

<sup>37</sup> *Narodowa Loteria Paragonowa*, <https://www.gov.pl/web/finanse/narodowa-loteria-paragonowa>; accessed: 28.01.2024.

<sup>38</sup> **A. Kowal-Pawul**, *Ekonomiczne uwarunkowania...*, p. 350.

<sup>39</sup> Pismo z dnia 12 czerwca 2017 r. Dyrektor Krajowej Informacji Skarbowej 0111-KDIB2-1.4010.7.2017.2.AT Limit 15.000 zł dla transakcji gotówkowych.

<sup>40</sup> *Jak przedsiębiorcy i konsumenci mogą płacić za transakcje: płatności gotówkowe i bezgotówkowe*, <https://www.biznes.gov.pl/pl/portal/001266>; accessed: 2.12.2023.

<sup>41</sup> *Dal 1° gennaio 2022 limite per l'utilizzo del contante a 1.000 euro*, <https://www.ipsoa.it/documents/fisco/imposte-dirette/quotidiano/2021/12/16/1-gennaio-2022-limite-utilizzo-contante-1-000-euro>; accessed: 2.12.2023; *Limits on the use of cash in Italy*, [https://www.europarl.europa.eu/doceo/document/P-9-2020-000369\\_EN.html](https://www.europarl.europa.eu/doceo/document/P-9-2020-000369_EN.html); accessed: 2.12.2023.



B2B transactions only are found in Belgium (€3,000), among others, while in Hungary, a monthly limit of 1.5 million forints (HUF) applies to legal entities, business associations and individuals subject to VAT.<sup>42</sup>

High hopes and expectations for the development of cashless payments in Poland are associated with the Cashless Poland Foundation (Fundacja Polska Bezgotówkowa – FPB), established in 2017 with the support of the Polish Bank Association, the Ministry of Development and the payment organizations Mastercard and Visa. The initiative's ambitious plan was to double the number of terminals in Poland from 600,000 in 2017 to around 1.2 million in 2021. The main tool for achieving this goal is the Cashless Poland Program, the core of which is a system of financial incentives for business owners in the form of a free card payment acceptance service (a free terminal and transactions up to a turnover of 100,000 zlotys for a period of 12 months).<sup>43</sup> According to data from the NBP, the number of devices accepting electronic payment instruments stood at 906,500 at the end of 2019, an increase of 313% compared to 2012. Despite the fact that in 2021 there were already more than 1.1 million devices, the FPB's target was not reached. The number of terminals per 1 million inhabitants in 2019 placed Poland in the bottom half of EU countries,<sup>44</sup> while in 2021 it ranked 8<sup>th</sup>.<sup>45</sup>

According to data from the National Bank of Poland, the value as well as the number of card transactions increased significantly between 2015 and 2022. Of course, the increase in the value of transactions may be related to inflation, however, as shown in Chart 1, the number of transactions in 2022 doubled compared to 2015.

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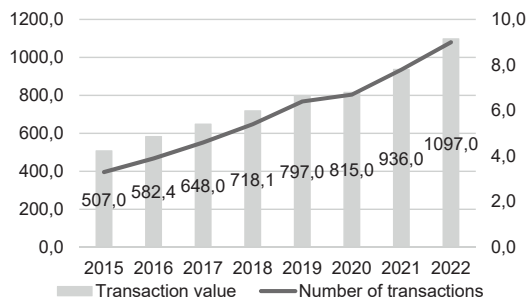
<sup>42</sup> *Cash payment: Cash limits in Europe*, <https://www.evz.de/en/shopping-internet/cash-payment-limitations.html>; accessed: 28.01.2024.

<sup>43</sup> **J. Fundowicz et al.**, *Szara strefa 2021*, Instytut Prognoz i Analiz Gospodarczych, Warszawa 2021, p. 23.

<sup>44</sup> **NBP**, *Porównanie wybranych elementów polskiego sektora płatniczego z systemami innych krajów Unii Europejskiej w 2019 r.*, Departament Systemu Płatniczego, Warszawa 2020, pp. 12–13.

<sup>45</sup> **NBP**, *Porównanie wybranych elementów polskiego systemu płatniczego z systemami innych krajów Unii Europejskiej za 2021 r.*, Departament Systemu Płatniczego, Warszawa 2022, p. 15.

CHART 1: *Number and value of payment card payments in Poland in 2015-2022 (in billions units/in billion PLN)*

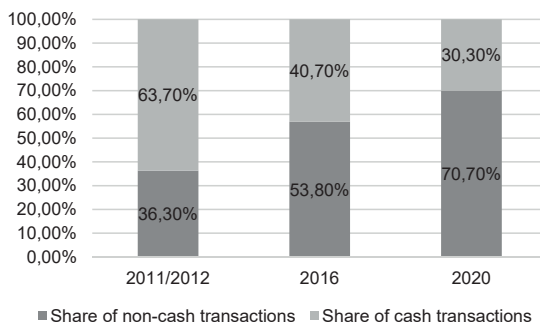


Source: own study based on: **NBP**, *Informacja o kartach płatniczych IV kwartał 2022 r.*, Warszawa 2023, pp. 9–14; **NBP**, *Informacja o kartach płatniczych IV kwartał 2017 r.*, Warszawa 2018, pp. 9–10; **NBP**, *Informacja o kartach płatniczych IV kwartał 2020 r.*, Warszawa 2021, pp. 12–14.

The NBP data<sup>46</sup> also show that the number of transfer transactions increased from 2.1 billion in 2015 to more than 4 billion in 2022. There was also an increase other non-cash payment instruments (including direct debits) in the same period.

In addition, the most recent data in the diary survey (Chart 2) shows that the share of non-cash transactions in the total value of transactions at physical retail outlets increased from 36.3% in 2011/2012 to 70.7% in 2020.<sup>47</sup>

CHART 2: *Comparison of the share of cash and non-cash transactions in the total value of transactions at physical retail outlets between 2012 and 2020*



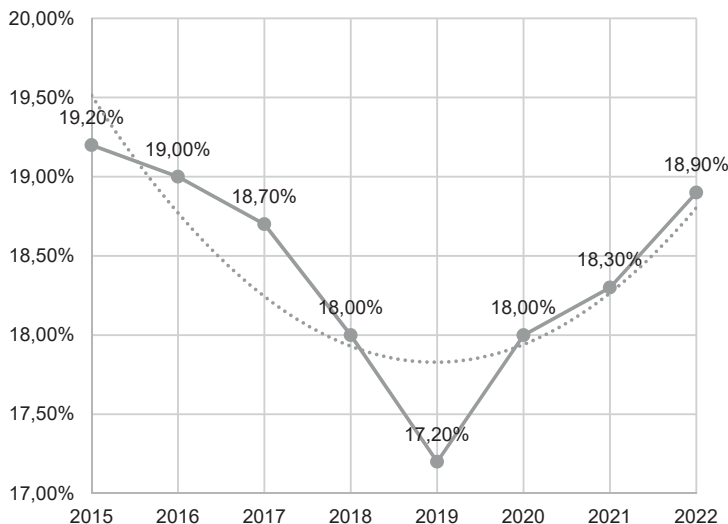
Source: own study based on: **R. Kotowski** (ed.), *Zwyczaje płatnicze w Polsce w 2020 r. Podstawowe wyniki badania*, NBP, Warszawa 2021, p. 74.

<sup>46</sup> *Ibidem*, p. 33.

<sup>47</sup> **R. Kotowski** (ed.), *Zwyczaje płatnicze...*, p. 74.

Although there has been an increase in the number and value of non-cash instrument transactions and their share in the total value of retail transactions, the share of the shadow economy has been steadily increasing since 2020 (Chart 3).

CHART 3: *Shadow economy as % of adjusted GDP (in IPAG terms)*



Source: own study based on: **J. Fundowicz et al.**, *Szara strefa 2021*, Instytut Prognoz i Analiz Gospodarczych, Warszawa 2021, p. 9.

According to IPAG estimates,<sup>48</sup> the shadow economy is expected to reach 19.6% in 2023, and several reasons for this are cited:

- the COVID-19 pandemic and the global economic crisis it caused,
- the Russian–Ukrainian war going on across Poland’s eastern border.

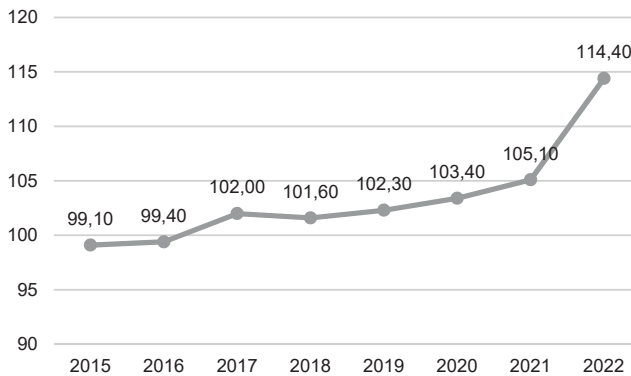
From an economic point of view, what these factors have in common is a negative impact on economic prosperity and an increase in uncertainty and risk. The weaker economy “forces” some companies to hide revenues. The war in Ukraine, the resulting crisis in the market for energy raw materials, and the unprecedented high level of prices have caused companies to seek savings in the shadow economy.

One of the effects of the COVID-19 pandemic and the war in Ukraine and the related energy crisis is the elevated level of inflation rates. It has been demonstrated that inflation has a significant impact on the development of the

<sup>48</sup> **J. Fundowicz et al.**, *Szara strefa 2023...*, p. 9.

shadow economy.<sup>49</sup> When goods and services are more expensive, consumers often seek cheaper substitutes, which are not always taxed. The least well-off and those for whom it is a matter of survival have also begun to look for solutions that bypass taxes.<sup>50</sup> In 2022, inflation in Poland reached its highest level since 1997 (Chart 4).

CHART 4: *Inflation, 2015–2022 (previous year = 100)*



Source: own study based on GUS data.

In addition, other factors for the increase in the size of the shadow economy are also mentioned:<sup>51</sup>

- minimum wage increase,
- unclear, inconsistent and unstable tax laws and the associated hassle of properly accounting for wages and calculating contributions (mainly during the months of mandatory legislation),
- increased social insurance contributions for sole proprietors.

These factors result in the concealment of all or part of the business, thus hiding income. The rising minimum wage and public and legal burdens (the high cost of doing business) drive mostly micro and small businesses into the shadow economy.

<sup>49</sup> T. Luong, T. Nguyen, T. Nguyen, *Rule of Law, Economic Growth and Shadow Economy in Transition Countries*, *The Journal of Asian Finance, Economics and Business* 2020/7 (4), p. 153.

<sup>50</sup> M. Rogalska et al. (eds.), *Przeciwdziałanie szarej strefie w Polsce*, UN Global Compact Network Poland, Warszawa 2023, p. 129.

<sup>51</sup> J. Fundowicz et al., *Szara strefa 2023...*, p. 9.

According to the study, electronic payments combined with the control and analytical tools (using artificial intelligence) that are at the disposal of tax authorities (SAF-T, online cash registers, STIR) reduce the possibility of escaping into the shadow economy. However, the economic downturn and other factors that determine the cost of employment are causing the size of the unobservable economy to increase. Nevertheless, it can be argued that if it were not for the development of cashless trading, the size of the shadow economy would be even larger.<sup>52</sup> Interestingly, according to the European Commission's data,<sup>53</sup> the gap narrowed from 24.6% in 2015 to 3.3% in 2021.<sup>54</sup> This shows that the combination of the development of cashless payments and modern analytical tools has mostly been successful in reducing tax fraud in the form of tax carousels or "empty" invoices.

#### 4. Conclusions

Tackling the shadow economy is key to improving state stability and security. A larger shadow economy leads to distorted competitiveness and dishonest actors who deliberately take advantage of legislative shortcomings or weaknesses in law enforcement and the judiciary. The literature repeatedly states that cash trading fuels the shadow economy, thus increasing the tax gap, and that the growth of non-cash payments undoubtedly promotes the reduction of activity in the unobservable economy.<sup>55</sup> However, in Poland, although the number and value of cashless payments have steadily increased since 2015 and new control and analytical tools have been introduced, the shadow economy has also increased. Our hypothesis (*H1*), i.e., *The development of non-cash payments in Poland (increasing their number, value and share in the total value of transactions made) contributes to reducing the size of the shadow economy*, has been rejected. Thus, the level of the shadow economy as of 2020 is determined by factors other than non-cash settlements, i.e. the difficult economic situation caused by the COVID-19 pandemic, the war in Ukraine and its consequences, the increase

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<sup>52</sup> *W Polsce rośnie szara strefa, ale mogłaby bardziej, gdyby nie rozwój obrotu bezgotówkowego. Nowa analiza*, <https://www.cashless.pl/13326-szara-strefa-a-obrot-bezgotowkowy>; accessed: 2.12.2023.

<sup>53</sup> **G. Poniatowski et al.**, *VAT gap in the EU – Report 2023*, Publications Office of the European Union, European Commission, CASE, Luxembourg 2023, p. 189.

<sup>54</sup> No data available for Poland for 2022.

<sup>55</sup> **A. Borcuch**, *Wpływ rynku płatności elektronicznych...*, p. 77.

in the minimum wage and Social Security contributions, or complicated and unstable tax laws. Continued research in this area is needed.

However, thanks to a combination of the increased number of cashless transactions and the analytical and control tools now available to the public administration, the tax gap in Poland is shrinking. It can be concluded that if it were not for the increase in the number and value of non-cash transactions, the level of activity in the shadow economy would be even higher. It is recommended that cashless payments be promoted and that progress be made in digitizing tax settlement.

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## PLATNOŚCI BEZGOTÓWKOWE JAKO ROZWIĄZANIE OGRANICZAJĄCE ROZMIARY SZAREJ STREFY?

### Abstrakt

**Przedmiot badań:** Z badań dostępnych w literaturze przedmiotu wynika, że płatności gotówkowe w znaczny sposób determinują rozwój szarej strefy gospodarczej. W Polsce rozmiar gospodarki nieobserwowalnej stanowi wyzwanie dla bezpieczeństwa politycznego i finansowego państwa. Ustawodawca wprowadza rozwiązania wykorzystujące technologię cyfrową oraz sztuczną inteligencję (JPK, kasy online, STIR, e-faktury ustrukturyzowane, *etc.*) mające na celu ograniczyć działalność w szarej strefie, która stanowi znaczną część luki podatkowej. Wymienione narzędzia przy dużym odsetku płatności gotówkowych nie są w stanie ograniczyć w znacznym stopniu jej rozmiaru. Niezbędne jest propagowanie i zwiększenie liczby płatności bezgotówkowych, które powinny poprawić możliwości analityczne i kontrolne służb podatkowych.

**Cel badawczy:** Celem artykułu jest wskazanie głównych przyczyn występowania szarej strefy oraz w jaki sposób przyczynia się do niej obrót gotówkowy. W artykule rozstrzygnięto, czy rozwój płatności bezgotówkowych (zwiększenie ich liczby, wartości oraz udziału w ogólnej wartości dokonywanych transakcji) przyczynia się do ograniczenia rozmiarów szarej strefy. Cel badawczy został zrealizowany, jednakże mimo wzrostu rozliczeń bezgotówkowych szara strefa systematycznie rośnie od 2020 r. Czynnikiem jej wzrostu należy poszukiwać poza sferą płatności.

**Metoda badawcza:** Badania oparto na kwerendzie literatury z zakresu gospodarki nieobserwowalnej, jej istoty i głównych przyczyn. Powołano się na badania dotyczące ograniczenia szarej strefy poprzez propagowanie płatności bezgotówkowych, przytoczono doświadczenia innych państw w tym zakresie. Dokonano prezentacji i interpretacji danych dotyczących płatności bezgotówkowych w Polsce – ich liczby, wartości i udziału w ogólnej wartości dokonywanych transakcji. Zestawiono je z danymi dotyczącymi poziomu szarej strefy w Polsce. W pracy posłużono się głównie analizą raportów branżowych i danych Narodowego Banku Polskiego i Instytutu Pro-gnoz i Analiz Gospodarczych.

**Wyniki:** Mimo coraz większej popularności płatności bezgotówkowych w Polsce, rozmiar szarej strefy powiększa się systematycznie od 2020 r. Wpływ ma na to głównie pogarszająca się koniunktura gospodarcza, która jest efektem pandemii COVID-19 i wojny w Ukrainie. W Polsce w dalszym stopniu duża część płatności jest realizowana gotówką, co daje nadal szerokie pole do ukrywania całości bądź części działalności szczególnie w czasie kryzysu gospodarczego. Rekomenduje się w dalszym ciągu promowanie płatności bezgotówkowych wraz z cyfryzacją rozliczania podatków.

**Słowa kluczowe:** szara strefa, płatności bezgotówkowe, luka podatkowa.