

SUSTAINABLE LOCAL DEVELOPMENT IN RELATION TO COMPLEMENTARY CURRENCIES ON THE EXAMPLE OF THE POLISH CURRENCY ZIELONY

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Abstract. The complementary currency Zielony (PLZ) is an example of an economic experiment, operating in Poland since 2015. It is also a new type of economic tool that supports the local economy and influences the creation of sustainable local developments. However, this impact is not direct, as it is realised through a network of micro, small and medium-sized enterprises operating in the local economy, which, among other things, create jobs relevant to the economic prosperity of the region and the life of the local community. The main objective of this article is to demonstrate the relationship between the use of the complementary currency Zielony in Poland by the entities that create the system of this currency and its impact on the economy, in particular on the local sustainable development in the pre-pandemic and pandemic period of Covid-19. The main research problem is formulated in the form of a question: “What are the benefits and opportunities for the economic entities of the local economy as a result of their accession to the complementary currency Zielony system?” The article adopts the following thesis: “The complementary currency Zielony in Poland positively influences the functioning of the local economy and the economic entities that belong to the system and promotes the creation of conditions that are important for sustainable local development. However, it works best when it is not disrupted by administrative barriers and lockdowns, like those that appeared in Poland during the Covid-19 pandemic.” The analysis carried out proved the validity of the thesis and allowed to solve the main problem. The study used the method of critical literature analysis and analysis of statistical data from 2015–2021.

Keywords: complementary currency, economics, finance, local development, local economic, management, sustainability development.

JEL Classification: B22, B26, M21, O11, P25, P34, P43, P45, P46, P63, Q01, R11.

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Introduction

In light of the International Labour Organization's (ILO) terminology, complementary currencies are one of the important tools of Social and Solidarity Economy (SSE) and alternative finance schemes and solidarity economy. They play an important role in community risk management and local development and are a mix of diverse, locally rooted, grassroots economic projects and initiatives. Although they operate at a small scale, they show the potential to build a more stable and people-centered monetary ecosystem, incorporating much more diversity in currencies as well as financial institutions. Moreover, complementary currency systems around the world suggest that they can also be a tool for sustainable development, especially in times of economic instability, due to, among other things: their use is limited to a specific space where they can strengthen local economic development and local democracy, their role in revitalizing and stimulating production and exchange, and their potential to modify values and social relations (Campinas, 2014; Serrano & Xhafa, 2011).

Complementary currency can be considered as one of the important tools for sustainable development, especially in relation to the local economy (cf.: Ministerstwo Rozwoju i Technologii, 2022). Therefore, complementary currencies respond to the need to increase access to finance and financial services. These new forms of social and solidarity-based financial mechanisms are based on collective principles of cooperation and self-organization and aim to democratize access to finance, reintroduce values and practices of solidarity and reciprocity into the financial sphere, support local economic development, and build communities (International Labour Organization, 2016). They play an important role in risk management and local development. Their effectiveness is greatest at a local level and at a small scale, these initiatives being one of the important components of SSE, point to the potential to create a more stable and people-centered monetary ecosystem that includes a much greater diversity of currencies and financial institutions (International Labour Organization, 2019).

According to the studies of various authors (Collom, 2005; Graugaard, 2012; Seyfang, 2001a, 2001b; Williams, 1997), the use of complementary currencies in terms of a local economy contributes, among other things, to: the promotion of sustainable development and social values, strengthening the economic position of the region and the position of citizens in meeting their basic and supernumerary needs, getting out of economic marginalization and increasing local wealth. Examples of complementary currencies around the world that have had an impact on local sustainability are: Calgary Dollar in Calgary (Calgary, Canada, since 1996), Chiemgauer (Rosenheim and Traunstein, Germany, since 2003), BerkShares (Berkshire County, USA, since 2006), Crooked River Alliance of Timebanks (Portage, Stark and Summit counties, USA, since 2010) and Sardex (Sardinia, Italy, since 2010) (Escobar et al., 2020a).

The subject of this paper is the complementary currency Zielony (PLZ) in Poland, which was created in 2015 and, so far, has been the only currency of this type functioning in this country. The basic assumption of the Zielony system is the cooperation of the participants and consumers associated within the system in the mutual settlement of commercial transactions using the contractual payment unit Zielony.

Zielony is a money substitute and acts as a means of payment in specialized communities where payments are made. It is a contractual means of payment, functioning in accordance

with the law (economic, banking, etc.) and a full-fledged example of how trade can be conducted using a contractual payment unit (cf.: Stepnicka et al., 2021).

The important feature of complementary currencies, including Zielony, that influences the development of the local economy and creates conditions that are important for local sustainable development, is the need of the complementary currency to circulate (rather than hoard), associated with the so-called “spoiling” of the complementary currency, i.e. incurring negative interest for holding it without trading it on the local market (known as demurrage, or loss of value of the complementary currency at the end of every month during which it has not been used for transactions; a charge on the unrealised positive balance of the currency. It works exactly like negative interest and is used to discourage users from accumulating currency). Also, from the point of view of local development the important thing is higher speed of circulation of complementary currencies in relation to the national currency, which influences the achievement of higher incomes in a given period of time, but also the rapid use of the complementary currency for commercial transactions, rather than storing it or keeping savings in it and inclusiveness, related to the possibility for entities and individuals who want to build a system to join the complementary currency system and at the same time benefit from the advantages of operating in the complementary currency.

Complementary currencies in the world, and the complementary currency Zielony in Poland, should be seen as a tool contributing to the implementation of various objectives of economic and social nature, but also as a form of an economic experiment, the implementation of which has been successful in a small number of regions that have implemented the described development tool. It has been successful in Poland, although its success is due to various factors, including the political situation and the attitude of domestic financial institutions to alternative sources of financing. The economic situation of the country, the types and frequencies of crises faced by the economy and society, legislation and liberalisation of economic law, administrative limits, and restrictions, are all factors which have determined the success of the Zielony.

The aim of the study is to show that the use of the complementary currency Zielony in Poland by local entities belonging to the complementary currency system can have a positive impact on both, the entities themselves and the system, which in turn can contribute to the development of the local economy and its sustainable development.

In addition to the main objective, the authors also formulated four specific objectives: two theoretical and two practical. The first specific objective is theoretical and relates to the presentation of the role and importance of complementary currencies in the economy and local communities. The second specific objective, also theoretical, relates to the characteristics of the system of the country's only complementary currency Zielony, created in 2015 by the article's co-author, as well as detailing the tasks, rights, and responsibilities of the administrator of the complementary currency Zielony. The third specific objective is to demonstrate the relationship between the number of new users and the number of completed transactions in Zielony in different periods, i.e. before the Covid-19 pandemic, in the period from March 2015 (from the establishment of the service) to March 2020 (up until the introduction of restrictions and lockdowns in Poland) and during the period of the global Covid-19 pandemic with its various periods of economic activity in Poland (in particular, administrative restrictions and lockdowns). The last specific objective is to indicate the impact of the com-

plementary currency Zielony in Poland on the sustainability of local development and the functioning of the local economy during the period of non-pandemic operations and during the period of economic collapse (or crisis) as an implication of the Covid-19 pandemic, and the barriers, restrictions and lockdowns that occurred.

In addition to the main and specific objectives, the authors also formulated a cognitive objective, a theoretical objective, and an application objective.

The cognitive objective of the work is the description and characterization of the system of complementary currencies in the world, including Poland, especially in terms of constructing a precise definition of the term “complementary currency” (i.e., alternative currency, local currency), as well as identifying the main benefits of their operation both for the local economy and the local community, as well as sustainable local development. Within the framework of the cognitive objective, it is also important to characterize the complementary currency Zielony in Poland, along with determining what this currency is and what the structure of the complementary currency system Zielony is.

The pointed objective results, among other things, from the lack of research on the Zielony in domestic and foreign literature. This is an important aspect, as, while various European countries (e.g. Switzerland, Germany, etc.) can boast a long and rich history of complementary currencies, which have been well researched and described, complementary currencies in Poland, although they were already functioning in the 19th and 20th centuries (as traditional coins, depository receipts, etc.), have not been sufficiently analyzed quantitatively and qualitatively. The same is true of Poland’s contemporary complementary currency Zielony, which was created in 2015 and replaced two other currencies: Piast and Dobry, which had been in operation for only a dozen months. Since 2015 Zielony is the only complementary currency in Poland, and so far, it has not received many scientific studies both in Poland and abroad. The presented study therefore fills an existing gap in the domestic and foreign market, as well as contributing to further research.

The theoretical goal of the study is to formulate general recommendations arising from the operation of the complementary currency Zielony in the local economy during the pre-pandemic and pandemic periods of Covid-19, with particular attention to lockdown periods and administrative restrictions, and to identify sectors and industries that were excluded from economic activity during the pandemic period.

The application purpose of the work is to develop and verify practical indications arising from the operation of the complementary currency Zielony in Poland in the pre-pandemic and pandemic periods, influencing the decisions of the participants of the complementary currency system regarding the circulation and payments realized in the mentioned currency, which in turn contributes to the creation of conditions conducive to the creation of sustainable development in the local economy.

The main problem of the study was expressed in the form of a research question concerning the benefits and opportunities that the entities of the local economy achieve from the building of the Zielony complementary currency system.

The main problem was detailed with three complementary problems expressed in the form of questions: “How did the Covid-19 pandemic and the instruments used during it to restrict and block economic activity in various sectors and industries in Poland, affect the

circulation and use of the complementary currency Zielony by the system participants?”, “What is the impact of the complementary currency Zielony in Poland on the functioning of entities entering the system and the local economy, and thus on the creation of conditions conducive to sustainable local development?” and “How does the complementary currency Zielony respond to the economic situation in the country during the pandemic period and in periods unrelated to the Covid-19 pandemic?”

The authors of the study adopted the thesis that the complementary currency Zielony in Poland contributes to the formation of conditions relevant to sustainable local development and has a positive impact on the functioning of the entities belonging to the system and the system as a whole, but during the period when the activities of the economic entities belonging to the system are not disturbed by the action of administrative barriers and lockdown, which occur during the economic and social crisis caused by the Covid-19 pandemic. This means that complementary currencies can influence local development by, among other things, supplementing the money supply, and can escape as a form of complementary means of payment in the local (regional or national) market during a stable economic situation and during periods caused, for example, by an economic or financial crisis (cf.: Zeller, 2020), but not during a period when external restrictions and administrative barriers (such as the aforementioned lockdowns) affect the economy and the entities operating within it.

However, when this stability is disturbed by non-economic factors (e.g. lockdown and administrative restrictions occurring during the COVID-19 pandemic, or political factors), the use of the complementary currency Zielony by the entities belonging to the system generally decreases, while the currency itself is not a tool to recover from the crisis caused by non-economic factors. This means, that they tend to appear during financial crises, when the failure of the dominant economic system to serve the weakest parts of the economy stimulates the latter to act (Dini & Kioupkiolis, 2019). Such a relationship was indicated, among others, by authors describing the introduction and circulation of complementary currencies, e.g.: the Wörlg Shilling in Austria in 1929, the Wära in Germany in 1931, the Arbeitswertscheine in Austria in 1932, the WIR Frank in Switzerland in 1934, or the Redes de Trueque system of complementary currencies in Argentina from 1995 to 2006. The Wörlg Shilling and WIR Frank currencies were responses to economic crises, stagnation, monetary instability, inflation, state money deficits, etc. (García-Corral et al., 2020; Ojeda, 2022; Zeller, 2020), while the case of Redes de Trueque is well known among countercyclical mechanisms, as it multiplied the consumption of thousands of low-income Argentine households during the economic collapse (Gómez, 2022). According to Ojeda (2022), “They have been issued by government officials to make payment obligations, secure income, and restore liquidity and demand, or by the private sector to encourage spending, support local economy and producers, and as a mode of resistance to the capitalist system”. Wörlg Shilling and WIR Frank made strong positive contributions to countercyclical growth by enabling the creation of interest-free “mutual” credit for small and medium-sized business sectors (Simmons et al., 2021), as well as improving local development by encouraging internal economic flow, preventing large capital accumulation, and maintaining the local environment by preventing capital flight due to its territorial limitations (Dini & Kioupkiolis, 2019; cf.: Hechenberger, 2018; cf.: Peacock, 2014). After numerous experiments with complementary currencies in the 1930s, renewed interest in them was born in the 1990s and continues today.

In the paper, the authors used the case study method, in which they characterized the complementary currency Zielony in Poland, pointed out the rights and obligations of the administrator of the said complementary currency and presented the structure of the system. Other research methods used in the study were narrative critical analysis of economics and finance literature and analysis of statistical data.

Narrative critical analysis of economics and finance literature was applied mainly in relation to the “Introduction” and “Literature Review” sections. The authors mainly used publications by foreign researchers and authors, including Blanc and Fare (2022), Collom (2005, 2011), Collom et al. (2012), Fare and Ahmed (2017), Fraundorfer (2022), Gelleri (2009), Seyfang (2001a, 2001b, 2002), Sae-Mi and Taewon (2021), Seyfang and Smith (2007), Seyfang and Longhurst (2013a, 2013b). They also referred to publications published by native authors, such as: Jardon (2016), Pater and Lewandowska (2015), Lewandowska et al. (2021), Rauschmayer et al. (2018), Sobiecki (2014), Ziółkowska (2018).

The statistical data analysis method, on the other hand, deals with the analysis of data from the database, managed by the administrator and coordinator of the complementary currency Zielony and co-author of the publication. The statistical analysis was based on two available datas, generated by the system: the number of users and the number of transactions in each month in 2015–2021. A certain limitation of the analysis is that only the data mentioned earlier can be generated in the complementary currency Zielony. On the basis of this data and the relationships between them, conclusions have been drawn. The scope of the study covers the pre-pandemic period of COVID-19 (February 2015, i.e., from the inception of the complementary currency Zielony to February 2020) and the pandemic period (i.e., from March 2020 to December 2021).

The research technique used in the study was observation, which made it possible to gather research material on new users registering in the complementary currency service and the number of transactions in it in 2015–2021. The afore mentioned research technique made it possible to learn about the studied reality, as well as to accurately identify, organize, and describe the interrelationships and interdependencies, including cause-and-effect, concerning the described complementary currency in Poland.

The research methods and techniques used made it possible to achieve the stated objectives, solve the research problem and confirm the thesis in an effective way.

The study consists of two main parts. The first part is devoted to the theoretical view of complementary currencies. In this part the authors have made a review of literature concerning the researched issues, as well as indicated the places of complementary currencies in the financial system of the state. In the second part the authors presented the results of research on the complementary currency Zielony in Poland and its impact on the functioning of entities belonging to the system in the period before and during the COVID-19 pandemic. The whole discussion ends with a synthetic summary.

1. Literature review

Complementary currencies have always existed alongside conventional currencies (Bindewald, 2021). By design, they are not intended to replace legal tender, but rather to meet the needs of certain industries, or sectors of the economy, which legal tender is unable to sup-

port for various reasons. They tend to emerge during financial crises, when the dominant economic system fails to support the weakest parts of the economy (Fleischman et al., 2020).

“Complementary currency” is a term used to describe the variety of contemporary alternative systems that exist alongside to mainstream money. They are means of exchange that circulate alongside national currencies based on collective agreements between users. Community currency systems generally serve a specific local area or region, often with positive social and economic effects (Mattsson et al., 2022). They are examples of the development of alternative economic spaces and a medium for the exchange of goods and services. Unlike conventional barter based on two entities directly trading with each other, complementary currencies expand trade by connecting a network of people and companies (Collom, 2011; Jonas, 2013), support new forms of exchange, are considered a vehicle for economic and social change, but also question the official monetary systems of states (Meyer & Hudon, 2017). Witt and Lindstrom (2005) for The E F Schumacher Society describe complementary currencies as monetary tools for building sustainable local development.

They are considered useful instruments to facilitate economic regeneration, but also as an important tool for human capital development (Kwon et al., 2017a). They are understood as a group of currencies or scrip used alongside standard currencies. They take the form of printed money that is used for purchases or can function as “virtual currency” that exists only in computerized accounts. They can be valued and exchanged against national currencies, but also act individually as a medium of exchange (Collom, 2005; Petri et al., 2012). It is such money that is often issued as non-profit initiatives to support transformation and socio-economic development at the local and regional level for the protection, stimulation, or reorientation of the region’s economy. They are increasingly used to lessen economic inequality, but also in development initiatives and humanitarian assistance. They also provide incentives for local transactions within a community (Belmonte et al., 2021; cf.: Gómez & Dini, 2016; Gómez & Helmsing, 2008).

Complementary currencies, also defined as community currency networks (i.e., so-called “Do-It-Yourself” groups; DIY) are created to build social ties in the community and increase accessibility to goods and services (Collom et al., 2012), and as monetary networks that use a specific medium of exchange to complement the national currency. They usually appear in times of economic crisis, among other reasons, due to their countercyclical function (Sartori & Dini, 2016; cf.: Ciccozzi, 2022; Kwon et al., 2017a, 2017b; Meyer & Hudon, 2019; Seyfang, 2002).

They can be described as an alternative form of financing and cooperation, eliminating external intermediaries, and providing direct interaction between partners. There are also examples of models that disrupt the established economic structure and existing business models. Using a payment system based on complementary currencies can eliminate the transaction costs associated with traditional payment systems and financial risks, contributing to the development of the sharing economy, and can provide a solution to the deepening crises of bank money mechanisms (Szemerédi & Tatay, 2021; Andreoni, 2020; Thlon, 2013).

The success of complementary currencies based on social networks is doubted, among others, by the work of Evans (2009). The author emphasizes certain shortcomings of Zelizer’s theory cited in the work, who pointed to the role of people creating new forms of money to

express social values, basing her theory on the examples of food and gift vouchers. According to Evans, the forms of money identified by Zelizer do not circulate in the market, while most monetary transactions in the world involve a form of market money. Also, long-lasting use of local currencies is rare, and the few successes are limited in scope. According to the author, such success cannot be attributed to a commitment based on social values.

Complementary currencies are mechanisms of parallel exchange led by civil society and designed to promote sustainable development, although they vary in the different features and purposes they must fulfill (Seyfang & Longhurst, 2013a; cf.: Michel & Hudon, 2015). As reported by Kwon et al. (2017a), complementary currencies promote social interactions, unblock information channels through interaction with other members, and influence the intensification of community attachment while increasing civic engagement. In light of the research findings described by the aforementioned authors, complementary currencies generate positive social, economic and environmental effects, such as reducing social exclusion, improving local economies and promoting local sustainable consumption (cf.: Fare et al., 2015; Kwon et al., 2017b; Lasker et al., 2011; Lewandowska et al., 2021; Meyer & Hudon, 2017; Sae-Mi & Taewon, 2021). As reported by Meyer and Hudon (2017, 2019), these collective organizational forms are based on inclusive mechanisms of community participation, fit into the dimension of “organizing for the common good” as they enable the creation of new communities, build communities by strengthening local social ties, and promote new economic patterns that are more sustainable and collaborative (cf.: Alia & Spiegelman, 2020; Fare & Ahmend, 2017; Fare et al., 2015; Giménez & Tamajón, 2019; Michel & Hudon, 2015).

Petz and Eskelinen (2019) report that complementary currencies are new types of economic tools that create structural incentives for local consumption and increase the speed of money circulation in the local economy. Kljucnikov et al. (2020) complement the functions of local currencies with their strengthening of economic activity, encouragement of enterprises at the local level, support of local citizens in buying or selling goods and services by creating networks with other people in the region. The mentioned authors state that complementary currencies play a key role in the development of local economies, building social relations between local residents and finding effective solutions to local problems of environmental nature (Kljucnikov et al., 2020; cf.: García-Corral et al., 2020; Nakazato & Lim, 2017; Richey, 2007; Seyfang & Longhurst, 2013b; Simmons et al., 2021).

In addition, complementary currencies can be seen as a form of “bottom-up initiatives,” which are defined by Seyfang and Smith (2007) as innovative networks of activists and organizations that lead bottom-up solutions for sustainable development. They are also solutions that are based on social economy principles and respond to the local situation and the interests and values of the communities involved. Bottom-up initiatives involve committed activists experimenting with social innovations and the use of green technologies and techniques (cf.: Suzuki et al., 2006).

There are also known examples of complementary currencies around the world that were created as community tools to facilitate the rebuilding of communities affected by various disasters (e.g., the impact of Domo currency after the Great East Japan Earthquake and Tsunami in March 2011. One of the key variables in rebuilding these communities was restoring the subjective mental health conditions of disaster victims, including strengthening social capital and sustainability) (Nakazato & Lim, 2017, 2020).

Diniz et al. (2018) following Ranalli (2013) pointed out the usefulness of complementary currencies in refugee camps suffering from currency and local resource scarcity. In addition, the use of complementary currencies for sustainable development policies also results in the implementation of smart meters that provide the necessary data on household energy consumption with respect to the use of complementary currencies to provide a form of so-called “non-financial incentive” for energy savings (Joachain & Klopfert, 2014). On the other hand, Hsin-Hui “Sunny” Hu and Parsa (2011) examined and described the impact of self-control and a dining companion (boss, friend, alone) on the consumers’ choice of alternative currencies, while Winfrey (2017) saw the creation of a local currency as a way to support the revitalization of cultural practices. In addition, they contribute to the mapping of human time into economic value in the local economy. Over time, they can devalue through the use of negative interest rates, thereby stimulating market exchange and encouraging greater market participation (devaluation also prevents the storage and accumulation of currency wealth and encourages spending when the value continues to fall). Through the use of high interest charges, complementary currencies can help to promote strong competition among market participants, but also support competitive innovation and more efficient use of resources (Petri et al., 2012; cf.: Ziółkowska, 2018).

Over the decades, examples of cities and provinces using complementary currencies appeared on the pages of various studies, we can see that the benefits of a complementary currency for a local economy and sustainable development, have remained almost unchanged. The experiment of the Austrian city of Wörgl, which in July 1932 introduced the local money Wörgl schilling, the so-called “free money”, or Freigeld (cf.: Stępnicka et al., 2020, 2021), issued in the form of banknotes (so-called labour vouchers), is one of many examples of the issuance of a complementary currency to supplement the deposits of a state currency. Two years later, in 1934, the complementary currency WIR franc (German: “we” or “our”) was introduced in Switzerland, and in the following years complementary currencies began to appear in other European countries and non-European ones.

According to Desquilbet and Farvaque (2022), the determinants of the success or failure of complementary currencies lie, among other things, in the number of potential users, i.e. buyers (households and individuals) and sellers (i.e. enterprises and suppliers of goods and services), the structure of user preferences (which includes the intensity of direct or unilateral network externalities, the intensity of indirect or transverse network externalities, and the maximum willingness of users to pay to join a community supporting complementary currencies), and the cost structure of the institution supporting low-cost businesses, whether it is an association or a private company. The results of the study also showed that the success (or failure) of complementary currency is also determined by administrative and economic constraints.

Since the introduction of complementary currencies, one of the goals of the grassroots complementary currency (in-community) movement has been to improve the economic situation of the surrounding area by offering an alternative to traditional currencies. Complementary currencies primarily aim to improve the local economy in promoting sustainable development (Zeller, 2020). In relating the impact of complementary currencies to local sustainability, the authors used the example of the impact of complementary currencies on

the development of cities and other territories described by Escobar et al. (2020b). According to the cited authors, complementary monetary systems can make cities and territories stronger, more resilient, and better able to absorb the effects of crises. Their goal, therefore, is to maximize the use of a medium, such as social and complementary currencies, to achieve the goal. Complementary monetary systems can be an instrument that the public sector, the private sector, the social and solidarity economy, and social innovation can use to create a new paradigm of more equalized and resilient cities (cf.: Jardon, 2016; Lewandowska et al., 2021; Pater & Lewandowska, 2015).

2. Research methodology

2.1. Characteristics of complementary currency Zielony (PLZ)

Zielony (PLZ) – Polish Local Currency is the only functioning complementary currency in Poland since February 2015. The analysed complementary currency is a contractual payment unit within the Zielony system, i.e. a mutual credit settlement system (Mutual Credit System), in which the administrator plays a supervisory role in accounting settlement procedures between two or more participants who are each other's debtholders and creditors and which involves compensating each other's liabilities. A PLZ is merely a record of the value of transactions effected and an accounting entry representing the equivalent: 1 Polish zloty (1 PLN) = 1 Zielony (1 PLZ).

The analysed complementary currency is regional in scope (it is used by entities in several provinces in Poland) and does not have a printed reflection (it is a computerised account entry). It is oriented towards communities, groups (it is the basis for the community dimension) and services. It takes a complementary form to the national currency and, like it, has an impact on local and regional economies. It cannot be bought and sold, but can be earned, received as a salary for work or as part of the so-called Zielony Plus, i.e. a loyalty system for private individuals – consumers who receive Zielony as a form of bonus (payment in Zielony is made by logging into the system or using a mobile device).

Zielony is a contractual payment unit in transactions between various participants: individuals, legal persons, organisational units without legal status, which conduct business activity or farmers, who signed a participation agreement with the administrator of the Zielony system. Participants of Zielony are mainly business participants (so called business-to-business), while the analysed system of complementary currency was created intentionally for structures of small and medium enterprises in Poland as a support tool on a difficult market. The system is also an attractive loyalty system for consumers, i.e. people who have a non-business, free account in the Zielony system, are not running a business but consciously supporting the domestic economy. Each participant of the system has its own settlement account, containing a record of all transactions of the participant in the Zielony system, it also enables transactions and the creation of trade offers.

Participants pay the following costs for their participation in the Zielony scheme: an annual administrative fee, i.e. the annual cost of participation in the Zielony system, paid for each year that the contract is valid and applied; a commission charge, i.e. a fee collected by an administrator to cover the costs of administering the system; a commission fee calculated

only on the PLZ turnover in the participant's account in the Zielony system; an annual fee for the abolition of commissions, i.e. a fee removing all commissions on transactions registered in the participant's account and an annual fee for the reduction of commission, after the payment of which the commission on transactions registered in the participant's account is reduced.

Membership in the system of complementary currency Zielony provides access to the tool that is Zielony – Polish Local Currency. It is a fully legal means of payment, having the so-called positive interpretations of the tax office, creating many new opportunities for entities belonging to the system, for example: meets the needs of small and medium-sized enterprises and creates a nationwide system of cooperation according to the principle “We will buy from you if you buy from us”, provides access to new business customers, among others things thanks to a unique consumer loyalty programme. Which increases the company's revenues, connects and integrates participants, encourages them to buy and sell each other's services and provides access to a trading platform, where an unlimited number of sales offers can be placed. Furthermore, it provides the means for building valuable business partnerships and contacts, within the so-called Zielony's Clubs (i.e. meetings of participants, organised by the administrator, aimed at acquiring new business contacts and education concerning the Zielony system. The Clubs combine the experience of participants and create conditions for networking, i.e. a network of entities that get to know each other within the purchasing platform and meetings within the Zielony Clubs – the element connecting various entities is cooperation and sharing experience). Additionally, membership in the system of complementary currency Zielony allows customer loyalty, mainly thanks to the possibility of building a bonus loyalty programme (as opposed to a discount loyalty system), facilitating the maintenance of customer relations (via a mobile application) and access to the so-called interest-free debit (Zielony Debit). The membership enables profit maximisation and financing according to the principle: “You pay back as much as you borrow”. It encourages employees to create incentive programs to increase their commitment (e.g. giving bonuses in Zielony) and enables savings of the national currency for essential expenses and investments (a part of the company and private liabilities is covered by the complementary currency Zielony, so members of the purchasing group can reduce their electricity and fuel bills, etc.). The complementary currency system Zielony provides advertising within the portal and mobile, where advertisements can be placed and it provides educational support through an updated e-learning platform, thus giving access to educational materials in the fields of sales, business management and marketing strategy building (Zielony – Polska Waluta Lokalna, 2022).

The functionality of the Zielony is based on a mutual recognition mechanism (mutual credit system) within which: every member of the community who joins the system commits to respect the principle of fairness in exchange and of trust in the integrity of others; this is important because it is the initiative of community members, their self-motivation and mutual motivation (while emphasizing the needs of local communities) that allows to maintain integrity within the group and its community. The aim of social currencies is not profit, and the liabilities incurred are almost never interest-bearing (members of the community do not make a profit, but receive an economic surplus through exchanges unconstrained by regulations, intermediaries, and corporations); it maintains personal balances of credit (negative

balance) or debit (positive balance) that change as transactions are made, and the real value of the balances depend directly on the multilateral consensus on the unit of exchange and how it is relatively valued (determining the relative relations between the values of the goods sold) and points earned while providing a service or selling a good can be used to purchase another service or good from another member of the same community (Sobiecki, 2014).

The system of cooperation within the Zielony community is a new, innovative solution, based on a contractual payment unit, which is used by partners belonging to the system. The key to cooperation between local entities is interdependence, while the key to earn Zielony and increase cooperation is the use of free capacity (products, goods, time). Users, by trading the complementary currency, influence the support of local companies. The complementary currency Zielony circulates in a closed circuit and is not able to go outside the created system (on the principle “You spend at those people, who then spend at you”). It is also the kind of system in which spending money pays off. Zielony is not able to disappear from the market, it has to circulate in it. The more Zielony is spent, the greater the chance that it will come back to the users. Zielony’s clearing accounts are subject to limitation according to the capacity of the respective business participant. Thanks to this solution, it is not possible to collect more of them than it is possible.

The complementary currency Zielony supports financing. It is also a form of communication channel allowing to reach new customers. Zielony changes its owner about 15 times a year (assuming that the Polish zloty goes through different owners about 3 times a year).

2.2. Duties and tasks, rights and responsibilities of the administrator

The complementary currency Zielony introduced under the auspices of the Association of Entrepreneurs and Employers is issued by the Association of Polish Producers. The Administrator of Zielony is Zielony Admin Ltd. based in Starachowice (Świętokrzyskie Voivodship), i.e. an entity which manages the Zielony system and provides services to participants. The Administrator is the organiser of the Zielony system in Poland through the creation of a common information portal and organisational structures operating regionally, administration of the www.zielony.biz.pl website and participants’ accounts in the IT system under terms and conditions defined by contract. One of the shareholders of Zielony is Spółdzielnia Kredytu Wzajemnego with its head office in Starachowice, which participants of Zielony are also entitled to join.

The responsibilities of the Zielony system administrator include: registration of the participant in the database published on www.zielony.biz.pl on a basis of an agreement; opening of a participant’s account containing a record of all transactions made under the Zielony system; maintaining a record of transactions in the participant’s account in an electronic form for a period of 5 years; publishing information about the participant on the website www.zielony.biz.pl and correspondence with the participants in the forms established by the agreement.

The tasks of the administrator of the Zielony system include administration of the [Zielony.biz.pl](http://www.zielony.biz.pl) website (updating, maintenance, etc.) and management of commercial information flow (concerning products and services to be purchased/sold in the system). This task is particularly important for small and medium enterprises operating in the system, which are

not able to manage such a flow of information on their own. In addition, the administrator handles administration and management of the trading system, including: managing the accounts of system users, the tasks deriving from the participation agreement, within which the administrator is responsible for storing information on booked transactions for a period of 5 years (coinciding with the regulations of the tax law in Poland) and the administration of a clearing system using the contractual payment unit of Zielony within the system for the benefit of a participant. An important task of the administrator is also managing the debit policy (i.e. managing the money supply, monitoring, designing and reacting to the money supply in the system). Zielony operates under the standard of a mutual credit system, which means that a new participant that enters the system may obtain from the administrator an interest-free debt facility (the so-called debit facility, granted on the basis of a separate agreement with the system participant for a limited period of time). This is agreed by the administrator on the basis of the overall situation within the system and between the participants, and the abilities of the entity requesting the debit.

A debit policy within the system and between users is important for the functioning of the complementary currency, *inter alia* to avoid causing inflation (which occurs when there are too many units of the complementary currency in the system in relation to the goods and services offered) and deflation (which occurs when there are insufficient units of the complementary currency among the participants in the system and they do not have the means with which to purchase goods and services).

If there are not enough funds to carry out purchase and sale transactions, the system does not work. The producer/seller is unable to sell a good or service in the system with a profit that is adequate for them). The administrator has the ability to manage inflation (the beginning of an inflationary situation requires the administrator to stop granting new debits) and deflation (the beginning of a deflationary situation requires, through an appropriate promotional action between participants, the administrator to increase the number of units of complementary currency in the system). If the administrator does not fulfil its debit policy functions, both inflation as well as deflation, may lead to the collapse of the system. Taking this into account, each participant, when joining the system, must declare a user account limit, i.e. its maximum capacity defined by the participant in the participation agreement to the Zielony system (i.e. define the value of goods and/or services that he manages to sell in a given year. This limit can be increased without the consent of the administrator up to 50 thousand monetary units). Reaching the maximum capacity of the account automatically blocks any further ability of the participant to accept PLZ payments in the Zielony system. Debit policy management is key in the operation of the complementary currency system; organisation of trade fairs, conferences, meetings of system participants within the so-called Zielony Clubs.

The administrator's rights include: in case of a participant's avoidance of the payments specified in the agreement, statutory interest will be charged and in case of non-payment after 45 days from the due date of the issued invoice, termination of the participation agreement, blocking of the participant's account and termination of the participant's offers published on www.zielony.biz.pl.

The responsibility of the Zielony system administrator is based on signed agreements.

2.3. The architecture of the Zielony system

The key to the functioning of the Zielony complementary currency system is the transaction system, i.e. the software that was custom-made and designed by the system administrators. This software is responsible for, among other things, making changes to the accounts of participants in the system, depending on the actions taken by them, transaction history, using online payments and the mobile application. The transaction system provides the possibility for participants to create trade offers, which are linked to the system’s website. Zielony’s transactional system is linked to the accounting system, which monitors invoicing, receipt of receivables, calculation of commissions on transactions, etc.

A separate element of the Zielony system architecture is IT outsourcing, where external companies update and upgrade the software design of the complementary currency system, provide server support, enable access to Google’s geolocation and mapping services. The relationships between the various systems that make up the architecture of the Zielony complementary currency system are shown in Figure 1.

A new business entity that signs a contract and joins the complementary currency system Zielony pays the administrative fees specified in the contract. A billing account is created for him, which is created on the model of a bank account. After registration, the entity gains access to the entire user base, i.e. a group of potential customers (regardless of whether they are offering a product/service for sale or not at the moment), gains access to the content of the portal and the settlement account, and gains the ability to create sales offers and sales inquiries (not binding to the signing of a sales contract).

After creating an account and accessing the database, the entity is given two opportunities to start cooperation with other entities operating in the complementary currency system Zielony. The first opportunity refers to the creation by the economic entity of an offer to sell its products and/or services for units of the complementary currency Zielony (most often these are surplus production of a given enterprise, such as: free rooms in the hotel and goods in the manufacturer’s warehouse). The second possibility comes down to the fact that an economic entity joined to the system of complementary currency Zielony does not have to create offers, but can start functioning in the system with the purchase of selected products and/or services. Then he benefits from an interest-free debit on his account, which he obtains

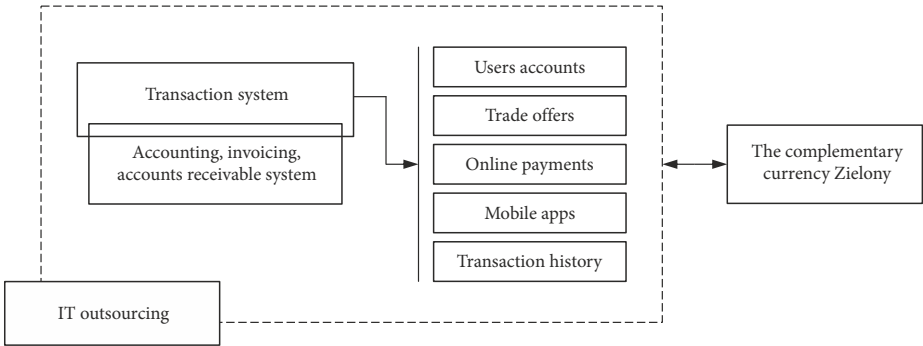


Figure 1. Architecture of the complementary currency system Zielony (source: own elaboration)

from the system administrator, which he must settle within a certain period of time (in order to repay the debit, the entity must make sales transactions for Zielony). The second option also allows him to save domestic cash, which positively affects his cash flow.

Transactions carried out using the complementary currency Zielony within the framework of online banking or mobile banking are fully legal under Polish tax law (cf.: Figure 2).

2.4. Research findings

To achieve the aim of the study, the author used data that was obtained from the administrator of the Zielony local currency system: the number of transactions executed in the system between February 2015 and December 2021 and the volume of turnover expressed in Zielony from the purchase/sale of goods and services by users belonging to the Zielony system between February 2015 and December 2021. These are the two main and the only data that can be generated from the system. They are used to calculate the average number of transactions carried out in the Zielony system per year and the average volume of trading expressed in Zielony per year.

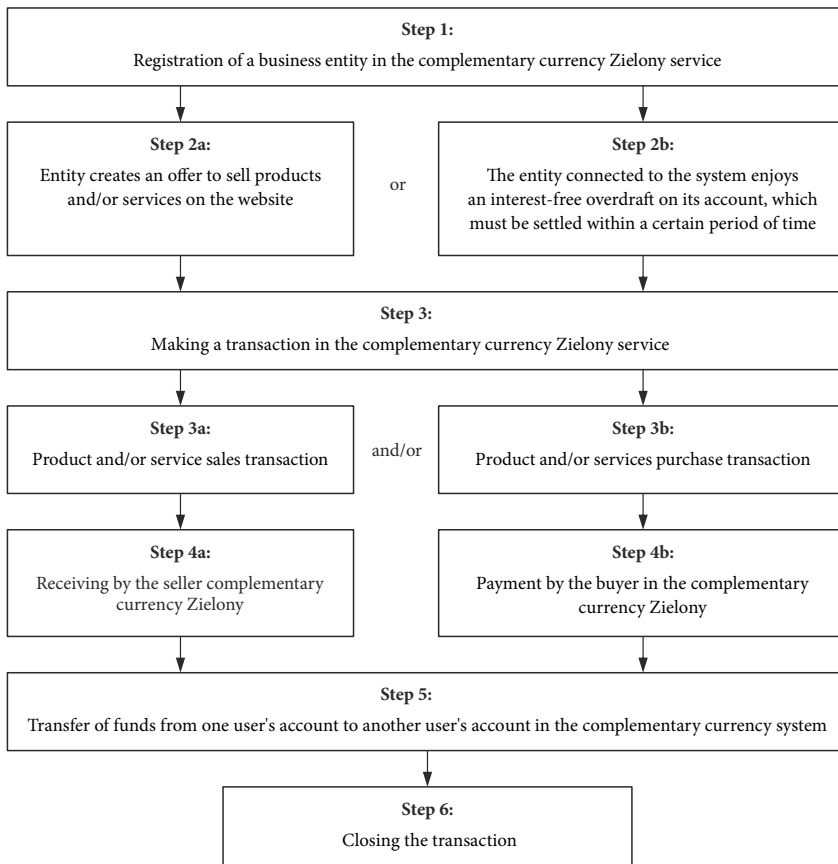


Figure 2. Scheme of registration in the system and purchase – sale transactions in the Zielony for entities joining the system (source: own elaboration)

Analysing the first of the examined quantities: the number of transactions carried out in the Zielony system from 2015, one sees an increase in the size of the indicator recorded until 2019 and a decrease in the number of transactions in the system from 2020. (cf.: Table 1, Figure 3).

Table 1. Number of transactions carried out in the system between 2015 and 2021 (in Zielony) (source: own elaboration based on Stepnicka et al., 2021; data obtained from the administrator of the Zielony complementary currency system in 2022)

Month	Year						
	2015	2016	2017	2018	2019	2020	2021
January	–	720	1 318	2 158	2 302	988	457
February	–	824	1 204	2 148	3 636	776	445
March	18	912	1 722	2 538	2 606	710	484
April	28	726	1 804	2 356	2 444	512	490
May	48	686	1 868	2 558	2 316	479	420
June	74	806	1 802	2 152	2 168	524	442
July	98	720	1 826	2 440	2 054	610	431
August	146	1 634	2 416	2 448	1 854	490	375
September	338	1 184	2 110	2 996	2 100	530	394
October	642	1 150	2 332	2 798	2 016	489	318
November	804	2 532	2 244	2 350	1 794	448	322
December	990	1 728	2 452	3 335	2 486	607	389

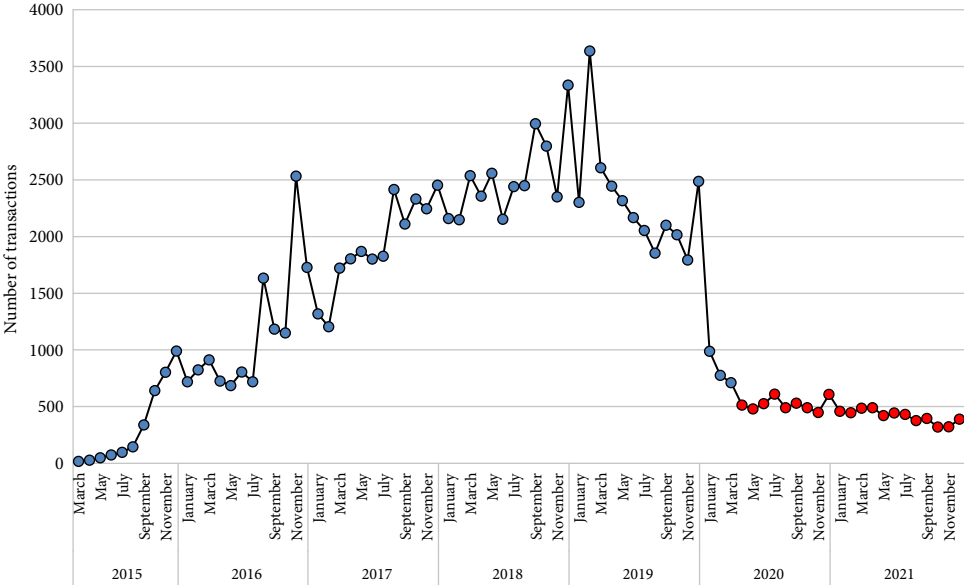


Figure 3. Number of transactions carried out in the system between 2015 and 2021 (in Zielony) (source: own elaboration based on Stepnicka et al., 2021; data obtained from the administrator of the Zielony complementary currency system in 2022)

The decrease in the number of transactions in the system and the decline in the average annual number of transactions from March 2020 is associated with the period of the worldwide Covid-19 pandemic and the lockdown periods introduced in Poland in 2020–2021. Taking into account the fact that 80% of the participants in the system are small and medium-sized service entities (i.e. restaurants, beauty service providers, hairdressers, hotels, gyms, etc.), these entities during the lockdown period had to suspend business activities due to the restrictions introduced in Poland (the structure of the performed economic activity both in Poland and in the Świętokrzyskie province has remained unchanged for years. The largest number of entities in 2020 in the Świętokrzyskie region conducted activities classified as services and other business activities – 73.25%, i.e. 87 942 business entities (Polska Agencja Rozwoju Przedsiębiorczości, 2021).

Lockdown and administrative restrictions related to the conducting of business activities by the main service entities in Poland in different periods of the pandemic caused that the number of transactions expressed in the complementary currency Zielony also decreased. This decline is noticeable in the period from April 2020 and continued throughout 2021. The lockdown contributed to a temporary cessation of economic activity mainly by service providers in the economy, which are 80% of the base of the Zielony complementary currency system (Stępnicka et al., 2021).

Taking into account the average number of transacted in the Zielony complementary currency system from 2015 to 2021, it can be seen that during the pandemic period, this average was higher only than the average obtained in the system in 2015, the year when the Zielony complementary currency project was launched in Poland (Figure 4).

Similarly, the volume of turnover expressed in Zielony between 2015 and 2021 obtained by entities belonging to the Zielony system and the average annual volume of turnover in the system during the indicated period depended on the economic situation in the country,

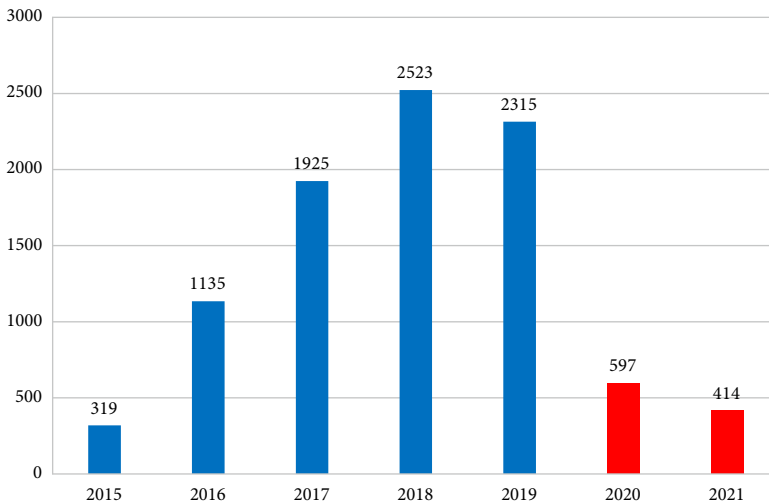


Figure 4. Average annual number of transactions carried out in the system between 2015 and 2021 (in Zielony) (source: own elaboration based on Stępnicka et al., 2021; data obtained from the administrator of the Zielony complementary currency system in 2022)

including objective factors not resulting from the economic situation but having a significant impact on it (i.e. the Covid-19 pandemic). Lockdowns and administrative restrictions, as in the case of the number of transactions carried out in the system meant that entities from the small and medium-sized enterprise sector, which provide services and are responsible for generating about 80% of the turnover in the Zielony system, were deprived of this opportunity (Stępnicka et al., 2021).

The lockdown and administrative restrictions in Poland during the COVID-19 pandemic also contributed to a decline in the volume of trade and services obtained by traders belonging to the Zielony complementary currency system. (cf.: Table 2, Figure 5). The average value of turnover from transactions carried out in the complementary currency Zielony in Poland in 2020–2021 also decreased significantly compared to previous years and was similar to the value recorded in the system in 2015–2016 (Figure 6).

The trends mentioned above in relation to the local economy in which the complementary currency Zielony operates are consistent with the analysis and results presented, inter alia, in the report entitled: “Poland’s socio-economic situation in times of pandemic”, prepared by the Department of Economic Analysis of Santander Bank Polska S.A. (Departament Analiz Ekonomicznych Santander Bank Polska S.A., 2020). According to the report, a side effect of the pandemic was a clear reduction in economic activity, while a deterioration in the assessment of the economic situation was recorded in all sectors surveyed by the Central Statistical Office in Poland. The greatest deterioration in ratings occurred in the accommodation and catering sector, which was almost completely closed for epidemic reasons. According to research carried out by the National Bank of Poland, in the first period of the pandemic, 80% of

Table 2. The volume of turnover generated in the system between 2015 and 2021 (in Zielony) (source: own elaboration based on Stępnicka et al., 2021; data obtained from the administrator of the Zielony complementary currency system in 2022)

Month	Year						
	2015	2016	2017	2018	2019	2020	2021
January	–	103 066	319 666	990 546	408 992	472 000	124 728
February	–	119 700	245 840	433 741	447 866	320 000	186 818
March	11 168	93 864	281 499	524 231	481 717	372 000	198 074
April	7 939	78 972	415 320	670 419	503 201	180 000	161 002
May	31 567	72 769	365 998	561 540	657 089	258 000	123 568
June	21 142	113 322	518 838	483 961	374 035	246 000	130 738
July	49 748	193 164	468 158	594 690	296 732	308720	130 802
August	61 345	194 867	568 570	360 586	298 530	184 030	103 382
September	71 879	206 593	664 148	467 141	570 600	166 216	85 928
October	74 408	202 389	436 072	581 187	577 293	138 156	101 444
November	73 080	492 988	569 878	395 278	388 284	165 334	93 848
December	149 200	347 472	615 088	656 292	415 317	248 472	109 500

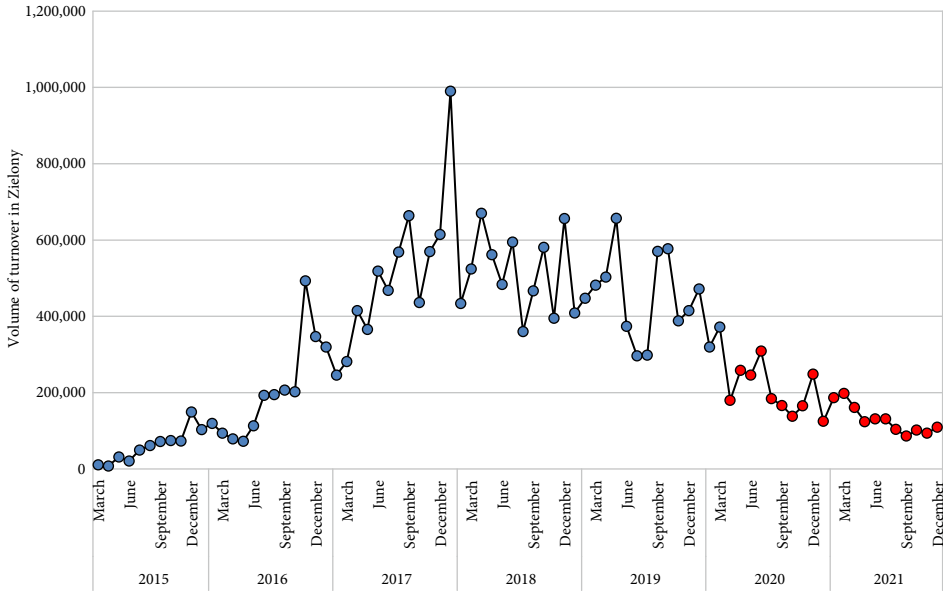


Figure 5. The volume of turnover generated in the system between 2015 and 2021 (in Zielony) (source: own elaboration based on Stępnicka et al., 2021; data obtained from the administrator of the Zielony complementary currency system in 2022)

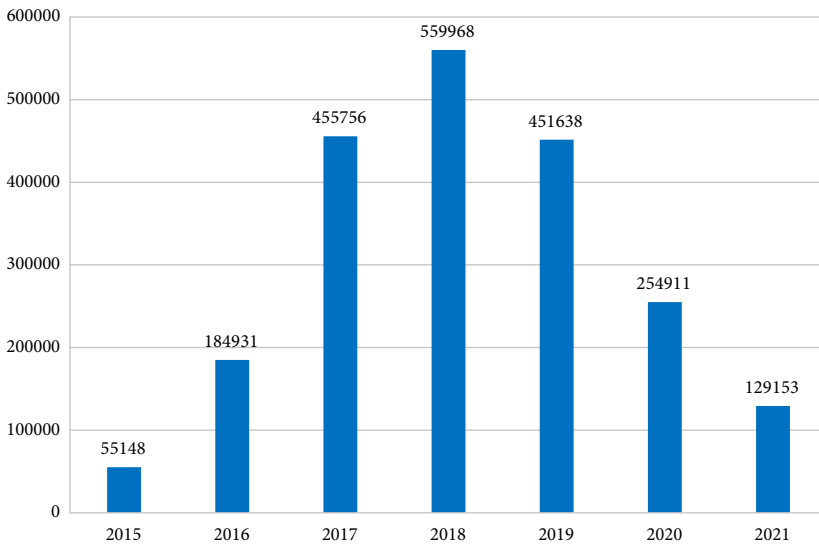


Figure 6. Average annual volume of turnover carried out in the system between 2015 and 2021 (in Zielony) (source: own elaboration based on Stępnicka et al., 2021; data obtained from the administrator of the Zielony complementary currency system in 2022)

hotel and restaurant businesses and half of the companies involved in culture, entertainment and recreation recorded a loss. Companies involved in other service activities (such as hair-dressing, cosmetics, and massage), tourism, culture, entertainment, recreation and education also assessed the economic situation particularly badly. The pandemic, and in particular lockdowns and administrative restrictions, have become the most important barriers to doing business, and in particular have contributed to increased uncertainty in doing business, lack of demand caused by the lockdown of the economy and by consumers withholding purchases, and through increased unit labour costs (Departament Analiz Ekonomicznych Santander Bank Polska S.A., 2020, cf.: Urząd Marszałkowski Województwa Świętokrzyskiego, 2021).

The pandemic has caused a recession such as domestic businesses have never experienced. Moreover, it has forced many changes in the way they operate and shaken up the labour market. Companies have faced restrictions on doing business at home and abroad, a shift from traditional to remote working, disrupted deliveries and a lack of direct contact with customers. Some did not survive, but many industries are prospering under the new conditions, proving their ability to adapt quickly to changes in the environment (Polska Agencja Rozwoju Przedsiębiorczości, 2021).

The pandemic situation also affected the number of transactions and the volume of turnover in the COVID-19 period carried out using the complementary currency Zielony, and the declining trend in the complementary currency system within the local entities affected by the lockdowns was analogous to the trends observed in the domestic market in the period under review (Figure 7). Companies reacted by, inter alia, reducing costs, including labour

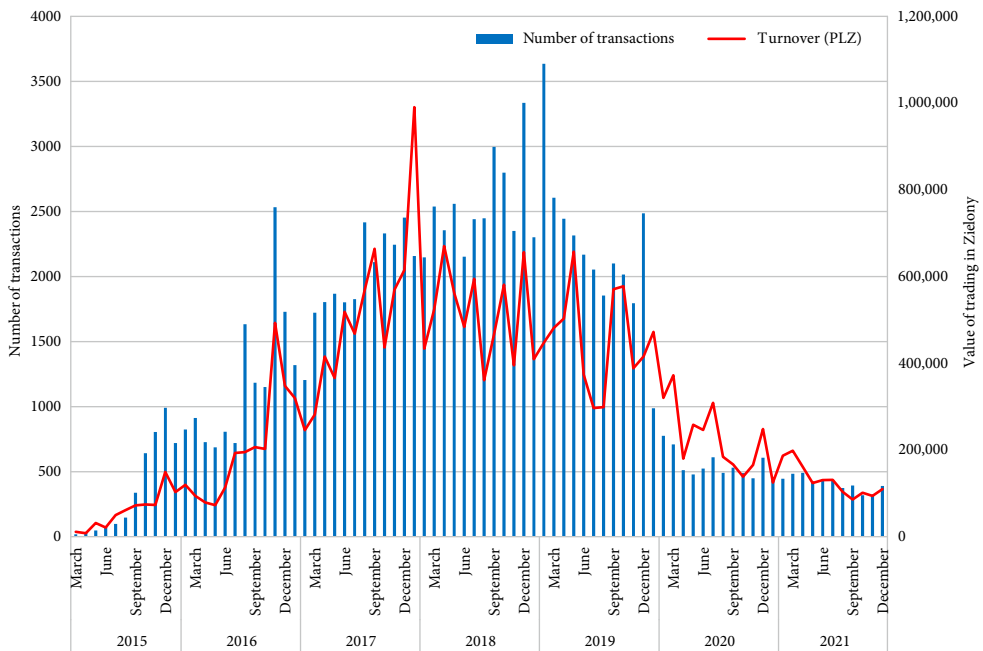


Figure 7. Number of transactions and value of trading in Zielony in Poland in the period 2015–2021 (source: own elaboration based on: Stępnicka et al., 2021; data obtained from the administrator of the Zielony complementary currency system in 2022)

costs (related, inter alia, to the number of employees, average wage levels), renegotiating existing contracts with employers and employees, changing suppliers (Departament Analiz Ekonomicznych Santander Bank Polska S.A., 2020).

From the point of view of the functioning of the local economy and its sustainability, as well as the pandemic situation and the Zielony complementary currency system, it also seems important to determine the degree of trust of users in the currency in the period before as well as during the pandemic. Indeed, the Zielony complementary currency is not legal tender, which means that contractors are not obliged to accept payment in this currency. It is therefore a contractual form of settlement of transactions, which means that both sides of the transaction must agree to settle the transaction in the complementary currency (especially the party that makes the sale and declares to accept Zielony as a form of payment). If the community using the parallel complementary means of payment in the form of Zielony currency starts to trust this means of payment, the increase in the level of trust in this means of payment results in an increase in the average transaction amount expressed in the complementary currency. This situation is expressed by the ratio of the average transactivity in a year (for individual years from the period 2015–2021), which is the ratio between the annual value of transactions in Zielony and the number of transactions in a year (for individual years from the period 2015–2021). The results of the average transactivity per year for individual years in the period 2015–2021 are summarised in Table 3 and Figure 8.

As the trust and experience of using the complementary currency Zielony grows, so does the acceptability of making transactions for larger amounts when settlements are made. What should be alarming to the administrator of the complementary currency is that the average transaction size has fallen more than 30% in comparison to the previous year.

Analysing the records of Table 3, it can be seen that, in the first year of the functioning of the Zielony complementary currency system project, the average transactivity (in other words, the average transaction made between project participants) was about 173 PLZ, while in the second year – about 163 PLZ. In 2017, the ratio was around 237 PLZ, which represents a significant increase in trust in the Zielony complementary currency compared to 2016 and 2015. In 2018, the average transaction amount was about 222 PLZ, which is less than a 30% decrease compared to the previous year. The average transaction rate in 2019 presents a similar situation.

Table 3. Average transaction volume per year (in PLZ) (source: own elaboration)

Year	Number of transactions per year (pcs.)	Annual value of transactions (in PLZ)	Average transaction volume per year (in PLZ)
2015	3 186	551 476	~173
2016	13 622	2 219 166	~163
2017	23 098	5 469 075	~237
2018	30 277	6 719 612	~222
2019	27 776	5 419 656	~195
2020	7 163	3 058 928	~427
2021	4 967	1 549 832	~195

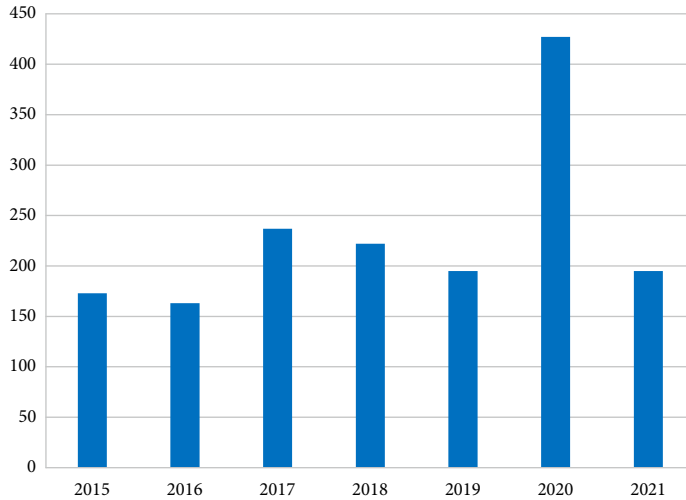


Figure 8. Average transaction volume per year (in PLZ) (source: own elaboration)

It is worth noting that the average transaction rate in 2020 was around 427 PLZ, despite the pandemic, lockdowns and other administrative constraints. During the period under review, because of the lockdown, about 80% of the entities belonging to the Zielony system, providing trading and service activity, suspended their activities. In fact, entities performing business activities and providing business-to-business transactions that were not subject to lockdown (e.g. manufacturers, contract service providers) were active. Transactions between B2B traders were higher than those between business-to-consumer (B2C) traders. During the period under review, there were no transactions in those areas of the economy that were subject to lockdown, hence the average transaction rate in 2020 reached such a level, even though the development of the complementary currency system Zielony did not occur.

In 2021, the average transactional rate of around 195 PLZ is a reference to the situation as described in the earlier part of the analysis concerning, inter alia, labour market imbalances, lack of demand, consumers withholding purchases, as well as fewer business-to-business transactions. However, this is not about a decline in trust in the complementary currency Zielony during the period under study, but the emergence of a concern related to the use of this transactional medium in difficult economic conditions (e.g. the inflationary process that began in 2021, resulting in, among other things, an increase in the prices of materials, products, services, etc.). In the administrator's opinion, the years 2020–2021, which were marked by time lockdowns, immobilising entire economic sectors, and various negative economic factors and effects (i.e. inflation, product shortages, supply interruptions) caused the average transactivity in the year under review to be unreliable, as the economic situation during that period was completely different from that in earlier years (2015–2019).

During the implementation of the study, the authors encountered several important limitations. These limitations, as a rule, are objective in nature, independent of the operation of the complementary currency system Zielony in Poland. The main limitations of the research are the lack of legal regulations in Poland relating to complementary currencies (such regu-

lations exist in several German states and the United States, among others). The legal basis for the complementary currency Zielony is an individual tax interpretation issued by the relevant authorities.

Another significant limitation was the lack of publicly available statistics and other empirical data on complementary currencies in Poland, including Zielony, published by relevant offices, organizations, and other data collectors, resulting in the need for the administrator of the complementary currency system Zielony to collect data and create internal databases.

Another important limitation was also the need to rely on data collected and provided by the administrator of the complementary currency system Zielony due to the difficulty or inability to implement the survey (e.g., in the form of a face-to-face interview using an interview questionnaire, or a diagnostic survey using a survey questionnaire) of entities participating in the complementary currency system Zielony.

The limitations outlined above require systemic solutions. A significant shortcoming that affects the above-mentioned limitations, among others, is the lack of promotion and popularization (e.g., within the framework of national campaigns) of complementary currency systems in Poland, including solutions based on the Zielony currency.

In conclusion, the effect of using a complementary currency is financial. A key element of economic well-being and sustainable development is the maintenance and creation of new jobs. For an economic entity operating in a local economy, the Zielony complementary currency system allows: to acquire a group of new customers, which is extremely important and difficult nowadays; increase the volume and value of sales; reduce monetary expenses expressed in the national currency, related to e.g. running the company (and thus increase the profit) and build business relations in the environment of small and medium-sized enterprises and combine their own potential, which, in turn, enables development that is not possible in relations with corporate entities (it is the so-called “space” that allows gaining new solutions and economic activities).

For the local economy, an important challenge is the lack of regression, which does not occur when there is development of the micro, small and medium-sized enterprise sectors, which creates jobs and pays taxes. The complementary currency plays an important role in this aspect.

3. Discussion

The considerations presented in this paper have contributed to achieve the main objective, i.e. demonstrating that the use of the complementary currency Zielony in Poland by local entities belonging to the complementary currency system can have a positive impact on their functioning and the functioning of the system itself, which in turn can contribute to the development of the local economy and its sustainable development.

The presented research results show a certain dependence between the functioning of the complementary currency system Zielony in Poland, including the formation of conditions for sustainable local development, and the Covid-19 pandemic and the constraints and administrative barriers that emerged during the pandemic. This relationship relates to the impact of the effects of the crisis, the implications of which include rationale, factors and

tools of a non-economic nature (e.g., political, legal, etc.) on the functioning and circulation of complementary currency in Poland, as will be discussed later in this subsection. It should be added that, although it is difficult to find the results of other studies on the complementary currency Zielony and its use in the pre-pandemic and pandemic periods in Polish and foreign studies, the results of the studies were referred to studies on selected complementary currencies carried out by other foreign authors.

The functioning of Zielony in Poland in the pre-pandemic period, i.e. from 2015 to 2020, confirms the considerations of various authors, including Witt and Lindstrom (2005), Seyfang and Longhurst (2013a, 2013b), Kwon et al. (2017a, 2017b) about the possibility of using this monetary tool to build sustainable local development (Seyfang & Longhurst, 2013a; cf.: Witt & Lindstrom, 2005) and use it as an instrument to facilitate economic regeneration (Kwon et al., 2017a). The example of the Zielony currency also confirms the theory of Meyer and Hudon (2017) that a complementary currency, can contribute to the economic and financial improvement of entities operating in the local economy, promoting local sustainable consumption. This is because the complementary currency Zielony contributes to enhancing the payment capacity of purchasers and entities that make up the system of Zielony, as well as enabling financing without the need to resort to credit or common currency. Its main advantage is that it is not transferred outside the area where economic activities (i.e. production, trade and services) are carried out by entities that do not use it. This internal circulation of Zielony in the region (e.g., in a province or in several provinces in Poland) ensures that Zielony does not flow outside the local economy and supports national market players, especially local ones that are part of the system. At the same time, this is one of the important factors in shaping conditions relevant to sustainable local development. The tendency of complementary currencies emerging during financial crises, when the dominant economic system does not support the weakest parts of the economy and their stimulating effect was demonstrated by for example Fleischman et al. (2020) in their studies.

The results on the number of transactions made in Zielony in the period 2015–2020, i.e. in the pre-pandemic period, also provide grounds for the conclusion that difficult economic periods, when lockdowns are in place or other administrative restrictions, do not affect it. The analysed complementary currency represents an alternative form of financing, but also of cooperation, providing direct interaction between partners and a form of so-called “bottom-up initiatives”, which are the result of the activity of activists and organizations leading grassroots solutions for sustainable development, as written about, among others, by Andreoni (2020), Seyfang and Smith (2007) and Szemerédi and Tatay (2021). In addition, the results of the study of the complementary currency Zielony in the pre-pandemic period and its positive impact on equalized local development, including the development of the small and medium-sized enterprise sector in the region, correlate with the results of the study by Belmonte et al. (2021), who, analysing the results of REC, a pilot complementary virtual currency in Barcelona, Spain, noted its positive economic impact on the local economy, in particular, increasing the activity of local stores, small and medium-sized enterprises and increasing the efficiency and impact of public spending. A study of the REC initiative provided the cited authors with evidence of the relationship between spending in the form of complementary currency and the promotion and development of the local economy. A

similar aspect is highlighted by the results of a study by Simmons et al. (2021), who, drawing on the experience of Italian peer-to-peer lending innovator Sardex and the WIR Bank in Switzerland, showed that the two currencies in question contribute to strong, positive countercyclical growth by enabling the creation of interest-free “peer” loans for the small and medium-sized business sector. The case of Argentina’s complementary currency *Credito* and its important role in reviving the economy and strengthening the importance of so-called provincial public services during the Argentine crisis and the collapse of the official peso currency in 2001 was referred to in his research by Kokabian (2020).

The functioning and impact of the complementary currency *Zielony* on the economic development of the region and the formation of conditions for sustainable local development in times of crisis or economic difficulties caused by administrative restrictions and lockdown, is slightly different. In 2021, in Poland, the restrictions which were introduced, resulted in the need for various service entities to stop/suspend their economic activity, which in the period under review accounted for almost 80% of all entities belonging to the complementary currency system *Zielony*. The lack of economic activity simultaneously resulted in a halt in the circulation of *Zielony*, and thus in a decrease in the number of transactions and the value of turnover made in the described complementary currency. While the spectacular examples of two complementary currencies, the Austrian *Wörgl* shilling and the Swiss *WIR* Franc, cited in the literature, confirmed the validity and effectiveness of the introduction of a local currency in situations of crisis, the effectiveness of the *Zielony* currency during the crisis following the Covid-19 pandemic combined with the administrative restrictions described above, was not confirmed.

The authors also achieved the set specific goals: they presented the role and importance of complementary currencies in the economy and the local community, and characterized the only local currency, *Zielony*. These goals were achieved mainly through the method of literature analysis and the technique of observation.

The implementation of the third and fourth specific goals was also important for the realization of the main objective. The relationship between the number of new users and the number of completed transactions in *Zielony* in different economic periods (i.e., before the Covid-19 pandemic, i.e., the period from March 2015, i.e., from the establishment of the service, to March 2020, i.e., until the introduction of restrictions and lockdown in Poland, and during the period of the global Covid-19 pandemic with its different periods of economic activity in Poland, especially administrative restrictions and lockdown) is strong. It is determined, among other things, by: the structure of the entities that make up the system of complementary currency *Zielony* (i.e. the more entities which activities may be restricted or suspended during a pandemic or crisis, the lower the circulation of the complementary currency *Zielony* and the capacity of the system), the economic situation in the country, and in particular the type of crisis that affects the circulation of the complementary currency in the system (the complementary currency *Zielony* will react differently to the consequences of the economic crisis and the financial crisis, and react differently to the consequences of a crisis in which mechanisms and tools that block or restrict the possibility of circulation of the complementary currency played a significant role). The complementary currency *Zielony* has a significant impact on the sustainability of local development and the functioning of the

local economy, but in a period of non-pandemic operation of the currency and in a period of economic collapse (or crisis), but not including the introduction of lockdown or restriction of the activities of the entities belonging to the system.

A simplified example of the circulation of the complementary currency Zielony in the local economy is illustrated in Figure 9: the owner of a local grocery shop, accepting the complementary currency as a form of payment, declares the possibility of spending this means of payment with other entities functioning in the local economy and belonging to the system, e.g. as payment for car repairs in a local garage (and as a form of payment for products purchased from a local manufacturer, which he will use in the production process), as he cannot do so with corporate entities that do not belong to the system. The owner of a local garage may spend the complementary currency Zielony he received for a repaired car from the owner of a local grocery shop, as payment for food delivered to him from a local caterer, whose owner, in turn, purchased the products necessary for the production of meals from a local fruit and vegetable producer with the Zielony he received. The local fruit and vegetable grower, with the Zielony he earned, may purchase hairdressing services from a local barber shop, while the owner of the local barber shop may spend the Zielony earned at the grocery shop.

The main problem of the study concerning the benefits and opportunities for economic entities of the local economy resulting from joining the complementary currency system Zielony has also been solved. The solution of the problem was made possible, among other things, by a critical analysis of the literature, as well as the results of our own research and observation of reality (the main research methods and research technique used in the study). As the analysis shows, one of the several, and at the same time the biggest, benefits of the complementary currency Zielony for the local community and sustainable development is the maintenance of local jobs by small and medium-sized enterprises. Zielony is also a determinant of support and development of the SME sector in the region. This sector is extremely

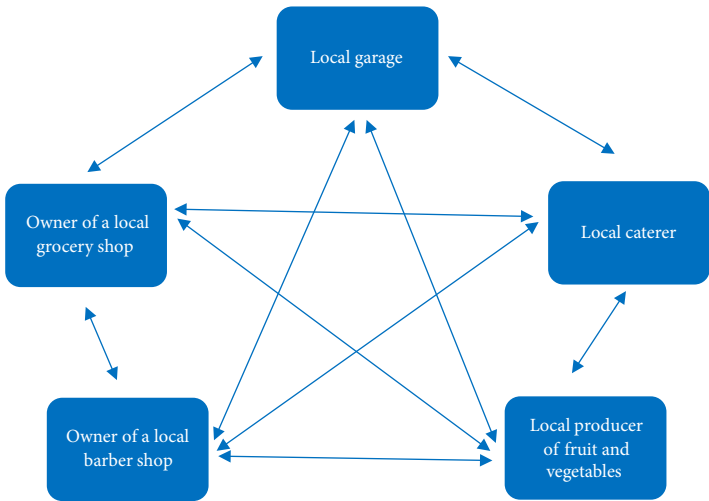


Figure 9. Simplified example of the circulation of the complementary currency Zielony in the local economy (own elaboration)

important for the functioning of the local economy by, among other things, creating jobs for the local community and preventing structural poverty. According to Grzeszczak (2018) “small and medium-sized enterprises play a key role in the local economy of each country. They have a significant impact in building economic growth and innovation in all sectors. Micro, small and medium-sized entrepreneurs create the most workplaces on the market, which directly contributes to the development of the region. Local entrepreneurs display entrepreneurship, diligence, ingenuity, and commitment, which has an impact on the development of innovation and advanced technologies. Companies in this segment operating in local markets contribute to the development of the global market”, but they are also a critical point and a necessary element for ensuring sustainable development in the local, as well as regional, national, or global system.

Small and medium-sized entities, due to the lack of adequate financial capital and opportunities to operate across borders, exploit local resources, providing themselves with the opportunity to produce and/or provide services. Having a transactional medium that operates in the small and medium enterprise environment in the local economy drives prosperity in that environment. By stimulating prosperity, jobs are secured and not reduced, and as they grow, local entrepreneurs can seek to create additional new local jobs. By protecting the local environment, including small and medium sized business entities, with the complementary currency of Zielony, its development is supported.

The results of the conducted study, as well as the theoretical considerations of the work, enabled the authors to solve specific problems formulated in the form of questions: “How did the Covid-19 pandemic and the instruments used during it to restrict and block economic activity in various sectors and industries in Poland affect the turnover and use of the complementary currency Zielony by participants in the system?”, “What is the impact and influence of the complementary currency Zielony in Poland on shaping the attitudes and behaviours of users of the system and the local economy, and thus on creating conditions that promote sustainable local development?” and “How does the complementary currency Zielony respond to the economic situation during the pandemic and non-pandemic Covid-19 periods?”

In solving the first supplementary problem, the authors referred to the presented statistics of the volume of turnover expressed in the complementary currency Zielony during the period of Covid-19. According to the analysis, the pandemic and the restrictions and lockdowns of economic activity in various sectors and industries in Poland contributed to the inhibition of the activity of entities belonging to the complementary currency system. Restriction or temporary cessation of production and/or service activity in industries on which restrictions and lockdowns were imposed resulted in a decrease in the number of transactions and the value of turnover carried out in the complementary currency.

Considering the second complementary problem, in the light of the presented results of our own research, as well as those of other authors cited in the paper (cf.: Kokabian, 2020; Simmons et al., 2021), the influence and impact of the complementary currency Zielony in Poland on the formation of attitudes and behaviour of users of the system and the local economy, and thus on the conditions conducive to equalized local development is positive. The complementary currency Zielony influences the development of entities participating in the system, and thus contributes to strengthening local development.

In response to the question that is the content of the third supplementary problem, based on their research, the authors claim that the complementary currency Zielony reacts negatively to the economic situation during the pandemic period, which is related to lockdown periods and introduced trade restrictions. In periods unrelated to the Covid-19 pandemic, the complementary currency Zielony performs all the functions typical of complementary currencies, as described in the theoretical part of the paper.

In light of the thesis adopted in the study, the complementary currency Zielony in Poland has a positive impact on the functioning of the entities belonging to the system, as well as the system itself, but mainly when production, trade and service entities conduct business without applying administrative restrictions or lockdowns that cause a periodic halt in economic activity, as was/is the case in Poland during the Covid-19 pandemic. When this balance is disturbed by non-economic factors (e.g. lockdown and administrative constraints occurring during the COVID-19 pandemic), the use of the complementary currency Zielony by the entities belonging to the system generally decreases. This is because, among other things, the principle of the necessity of the circulation of the complementary currency Zielony in the local economy is violated, which is a consequence of the cessation or reduction of economic activity (activity) during the lockdown period mainly by various service providers (e.g. hair-dressing salons, fitness clubs ect.), which in the case of the complementary currency Zielony represent about 80% of the system. This causes the circulation of the Zielony currency in the system to be limited, which affects, among others, the daily (but also monthly or quarterly) number of transactions in it and the volume of turnover obtained in Zielony by entities belonging to the system. A decrease in the afore mentioned indicators and values influences the limitation of local economic growth and sustainable development in local perspective.

The effect of using the currency is a financial one.

Conclusions

Complementary currencies, including the Zielony in Poland, which has been in operation since February 2015, are a response of representatives and supporters of heterodox economics (including representatives of social economics, alternative economics, experimental economics, local development economics, or representatives of the ecological-alternative community), among others, to financial crises resulting in the lack of state money. Complementary currencies are also tools that can support the development of the local economy and foster the creation of conditions for sustainable development in the region. However, these goals can be achieved when the economy functions in conditions undisturbed by, among others, administrative actions, which are related to restrictions, barriers, orders and bans on economic activity. The complementary currency stimulates the local economy, supports local entrepreneurship, fosters relations between local economic entities within the business-to-business and business-to-consumer models, prevents the outflow of monetary capital outside the local economy and its translocation to foreign entities (including corporations).

Like other complementary currencies in the world, the Zielony represents an alternative form of payment for products and services produced in the local economy (i.e. it performs the most important function: the medium of exchange), it allows for an increase in the

turnover of local economic entities that have agreed to accept it as payment for sold goods or provided services, but it also allows for the reduction of risks associated with the outflow of capital from the local market. The complementary currency *Zielony* provides better protection against the effects of financial speculation, while its use by local entities promotes the creation of additional jobs. The most important advantages of complementary currencies, affecting their use in local communities as well as fostering the development of the local economy and creating conditions important for local sustainable development, include: the fulfilment of the three classical functions of money (a measure of value, a medium of exchange and a means of storing value); interest-free, implying no debt generation for those who have borrowed from the system in the complementary currency (loyalty or peer-to-peer lending schemes do not charge interest, and interest-free loans can also be obtained in complementary currency schemes) and closed circulation, allowing the complementary currency to be maintained in the local economy and avoiding its absorption by entities that are not a part of the system (especially corporations and foreign companies).

The complementary currency *Zielony* stands in opposition to the monopolisation of the market by large corporations and foreign capital and the corporatisation of national economies and the global economy. The disappearance of production and/or service processes carried out by local producers, local sellers, and local service providers in local communities in some way deprives people living in local communities of opportunities to earn a living. This means, therefore, that the problem in local economies dominated by foreign capital and market monopolisation is the loss of local jobs, but also the disappearance of factors supporting the local economy, including the service sector provided by local entities (e.g. plumbing services, mechanical services, catering services, workshop services, etc.). Negative processes emerge, such as a deepening area of poverty, which cannot be prevented or limited by social assistance or social aid, a decline in morality and increased social unrest, an increase in suicides, crime (initially petty, and later also on a larger scale) and robberies on a micro- and macro-scale. Supporting the local economy with the complementary currency *Zielony*, which is at the disposal of communities and small and medium-sized enterprises, gives these entities a tool to fight for their place in the market. Thanks to the complementary currency *Zielony*, money is kept in local circulation. As the influence of corporatisation and globalisation with all their consequences is noticeable in the local economy, the flow of money in local structures becomes an important problem. Operating in them only with state money of extraordinary liquidity, there is a siphoning off, of transactional money, which then leaves the local economy. *Zielony*, by its very nature and projection, is not issued in corporate structures that are not part of the venture and complementary currency system of *Zielony*. Consequently, owners of local economic entities seek out other entities operating in the local economy that are part of the system to cooperate and exchange *Zielony*. These shapes the circulation of the complementary currency *Zielony* in the local economy. Entities belonging to the small and medium-sized enterprise sector, functioning in the local economy create jobs for the local community, and thanks to the support in the form of an additional means of payment, which is the complementary currency *Zielony* can develop and thus support sustainable local development.

The main reason why a business venture is closed, is because it is not making enough profit. This happens when there are too few customers, as a certain percentage of them drift away to corporate structures. For the SME sector, the acceptance of the means of payment and the complementary currency Zielony gives access to a new group of customers. The influence of the complementary currency Zielony on the development of the SME sector and thus on the formation of conditions for sustainable local development is direct. This means that the acceptance of payment in the complementary currency Zielony gives access to new customers.

Another important aspect resulting from the functioning of the complementary currency Zielony, influencing the development of the local economy and local sustainable development, is a factor of psychological nature. Internetisation, networking and the virtual world are playing an increasing role in interpersonal relations. The element of personal interaction is disappearing. Through the activities of Zielony's Clubs, meetings, and direct interaction, Zielony is involved in building a community of users and relationships, based on face-to-face relations.

Besides, the well-developed complementary money structures mean that local communities do not have to go into debt in the global banking system. Unlike commercial banks, debt in the Zielony complementary currency system is interest-free debt.

The future of the complementary currency Zielony in Poland is conditioned by the further situation related to the COVID-19 pandemic and the restrictions associated with it. In the case of further periods of lockdown in the future, there will be, *inter alia*, price increases, restrictions on doing business and/or the closure of local businesses. This will mean that the use of the complementary currency Zielony may be limited due to, among other things, a decrease in the number of entities operating in the micro, small and medium-sized enterprise sector in the country, region, and local economy, a decrease in demand for the services of this sector and thus a reduction in the entities participating in the project of the complementary currency system Zielony, higher costs associated with doing business, and an increase in unemployment. In the case of a future financial crisis, for example because of the COVID-19 pandemic, the complementary currency Zielony will play an important role in supplementing money supply into the local market. During a financial crisis, domestic money is expensive, and its cost is constantly growing. This will cause people to look for other sources of finance, and the complementary currency will be able to fill this financial gap in the money and commodity markets. In the case of a recovery from a pandemic, business entities, despite the increase in prices of fuel, energy etc., will make efforts to maintain and develop their business, seek new solutions and channels to reach new customers. To reduce the costs of doing business expressed in the national currency, the owners of economic entities will look for alternative sources of financing, the solution to which may be the complementary currency Zielony.

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