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Preface

Dear Readers,

We are pleased to present the latest issue of the **Research Papers in Economics and Finance** published by the Poznań University of Economics and Business Press. We have selected five scientific papers that we consider important for the academic discussion, works which inspire and provide substantial added value.

This issue opens with a theoretical paper written by **Dr Karolina Nowak** from the Poznań University of Economics and Business, Poland entitled *On the concept of good with continual reference to economy. What is the axiological background of collaborative consumption society?* The authors of the article analyse selected examples of redefinition of the concept of good in the context of new social narratives and the grounding of certain beliefs related to the idea of degrowth and sharing economy. The understanding of good as the community of consumption, focused on degrowth and the future generations and awareness of limited resources, is not becoming more widespread. Sharing economy, which grew out of the opposition against the consumption "drive" and the narration of profit, in a way substantiates the need to possess and the idea of growth to which it stands in opposition.

The second great paper entitled *Entrepreneurship as an occupational choice* has been written by **Prof. Aleksandra Gaweł** from the Poznań University of Economics and Business, Poland. The author of the article shows that the flows between proper entrepreneurs and quasi-entrepreneurs connected with decisions to either hire or lay off staff are crucial for moderating the occupational choice, and thus, lead to changes in the employment structure. The revival of the market situation prompts us to follow the path of proper entrepreneurship or to become employed persons, abandoning quasi-entrepreneurship. The recession of business opportunities, in turn, is the reason for the reduction of relevant entrepreneurs and the reduction of employment, leading to an increase in the number of quasi-entrepreneurs.

The third paper entitled *Impact of government spending and corruption on foreign direct investment in Indonesia* has been written by **Dr Adya Utami Syukri** from STIE Tri Dharma Nusantara, Makassar, Indonesia and **Basri Hasanuddin, Abdul Hamid Paddu, Sultan Suhab** from Hasanuddin University, Makassar, Indonesia. The results of the study clearly show that the higher the corruption level in the country, the lower the investment inflow. Hence, postulates have been formulated for the Indonesian government to fight corruption in the country, which is a significant barrier to the development of the economy.

The fourth original and topical paper written by **Prof. Ryszard Barczyk, Dr Joanna Spychała, Dr Zuzanna Urbanowicz** and **Dr hab. Agnieszka Ziomek, prof. UEP** from the Poznań University of Economics and Business, Poland is entitled *What to look for to increase work added value? Remote work and perceived productivity: A study in Poland, Hungary and the Czech Republic.* The authors have used surveys to identify factors determining perceived productivity of individual workers who perform their job remotely and to measure the importance of factors determining labour productivity. The authors proved that high stress, low employee control and limited communication with managers minimise the growth of remote work productivity, since social relationships at work are correlated with productivity. Nonetheless, work organisation traits such as the proper work environment, travel cost savings, access to technical assistance and a fast Internet connection remain positively related to remote work productivity.

The fifth paper entitled *Index of the cycle of money—the case of Poland* has been written by **Constantinos Challoumis** from the National and Kapodistrian University of Athens in Greece. According to the results obtained, Poland is above the worldwide average index of the cycle of money. The author proved that Poland is a well-structured economy able to overcome an economic crisis.

Piotr Lis
Editor-in-Chief

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On the concept of good with continual reference to economy. What is the axiological background of collaborative consumption society?

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Abstract: The rationale for choosing the object of research is the recognition of the socio-cultural validity of new ways of management (New Economy), interpreted as a response to the exhaustion of traditional ways in which societies function, i.e. those based on ideas of growth and ownership. The aim of the article is to analyse selected examples of redefinition of the concept of good in the context of new social narratives and the grounding of certain beliefs related to the idea of degrowth and sharing economy. The article is theoretical and references to contemporary research on cultural philosophy and social analyses of economic practice. A socio-regulatory concept of culture was adopted as a research perspective, and humanistic interpretation was used as an explanatory procedure. Qualitative data was analysed using atlas.ti, concept driven coding was used, and content analysis was limited to concept analysis and the creation of conceptual maps. The research results are supposed to show: 1) the impact of modern forms of economic practices using the Internet and IT technology on the redefinition of good, 2) how this redefinition builds the axiological background of society of collaborative consumption.

Keywords: values, good, culture, degrowth, sharing economy.

Introduction

The title is a paraphrase of the title of Kierkegaard's book on irony (On the Concept of Irony with Continual Reference to Socrates). In the same way as Kierkegaard takes Socrates as the starting point for his considerations, I base my analysis of the contemporary redefinition of good on "continual reference" to the New Economy (Xie & Zhang, 2021). I am looking at selected aspects of the economic practice of Euro-Atlantic societies in an attempt to find the contextual sources for the redefinition of the concept of good as a world-view background for collaborative consumption society. Contemporary practices of economic exchange based on easy technology-enabled access to goods and services (for example ordering a ride at the click of a button) have changed how we define

processes, relationships and business partnerships. How has this change been reflected in axiology? Do contemporary societies, with their labile world views, politics and economy, existing in a limbo-like state, waiting for new crises to strike, undertake actions whose primary sense is good, understood as a form of defense against socially problematic challenges?

My attempt at the reflections on the axiological context of contemporary economic practices is motivated by the fact that the axiological vision of "bloodthirsty" capitalism, driven by competition, profit, growth and consumption, can no longer be upheld (Antinyan et al., 2020). The crisis of the existing axiological approaches is believed to be manifesting as polarisation of societies, inequalities, social exclusion, climate and economic disasters as well as legislative difficulties. The neoliberal capitalistic vision of the world can no longer serve as a meaning-making world view, which imposes sense on actions taken by people in different sectors of social practice (not only in economic practices, but also in the area of customs, research or art) (Zboroń, 2015). The main research objective of the article is to identify the impact of selected economic practices on new ways of conceptualisation of good and to show how such conceptualisation is gaining ground as an axiological basis in a specific sector of social practice, i.e. economic practice. Do contemporary business models, which take the post-crisis conceptualisation of good (based on the feeling of community, degrowth, justice) as their axiological basis, actually contribute to the social grounding of this conceptualisation of good? Or perhaps we may be witnessing the opposite trend involving a cynical business game between individual points in the flow (of goods, services, information) within a network, a game which not only does not sustain the new conceptualisation of good, but even makes it weaker?

1. Literature review: The cultural background of collaborative consumption society

The cultural background of the emergence and functioning of collaborative consumption society may be seen in terms of three types of epoché—the suspension of the current ways of describing the world and the values which underlie those descriptions. More and more often some of the beliefs which have so far regulated human activity are becoming "exhausted"—and as such they are subject to suspension, epoché, bracketing. These beliefs are respected only in declarations, i.e. people still declare them to be important and valid, while in actual fact (in action) these beliefs no longer guide human actions. Epoché of current beliefs may be categorised in three distinct types in terms of custom, cognition and language.

In the first epoché, the suspension applies to beliefs which have so far been used to give meaning to actions taken in the context of customs, shared social

reactions to specific events, time or place. In sociology, custom and habit are differentiated according to the commonness criterion. If a certain behaviour is typical of an individual, the term *habit* is used (e.g. having a cup of coffee first thing in the morning). If a similar behaviour is exhibited by large numbers of people, we call it a custom (e.g. decorating a Christmas tree) (Giddens & Sutten, 2021). The analysis of the world-view sources of custom practices of post-modern societies usually starts with the concept of consumption and the associated experiences (Shoham & Gavish, 2017). At the same time, this type of epoché seems to have two "faces" when analysed in the context of the concept of consumption: origins (what type of need is addressed: obligation or pleasure) and time (time when a need is addressed: tomorrow or today).

So far the beliefs which add meaning to custom-related consumption have relied mainly on the idea of duty and obligation (I decorate a Christmas tree because one should do so to create Christmas spirit, I cook twelve Christmas Eve dishes, because this is how we should celebrate the time of waiting for Christmas; I put up a flag on a specific day, because this is my patriotic obligation). Such beliefs continue to be referenced (also in advertising) quite often (Shareef et al., 2018). However, researchers also identified another type of value-assignment in consumption and consumer behaviour (actions and reactions) based on bliss, luxury and pleasure (I decorate the Christmas tree and my house with lights because flickering lights attract attention, the twinkle is pleasant to look at; I wear national colours when I go to a football match, because it looks *cool* in the stands) (Christodoulides et al., 2021). This type of value assignment is more and more often used in practice and in a way suspends the power of obligation-based beliefs, irrespective of whether they have religious or more traditional (from the philosophical perspective—e.g. Kantian ethics of duty) grounding.

The conceptual source of a new understanding of the world-view roots of actions of members of contemporary (post-modern) societies can be traced back to Roland Barthes' (1997) reflections on the *jouissance* and *plasir* of a text. Both the ecstatic, individualistic bliss, and the experienceable culturally generated pleasure are two types of "concepts which describe the reader's feelings when interacting with a text" (Mamzer, 2005, p. 28). They both refer to a specific reception, grounded not so much in the text itself but in the relation between the recipient and the text. This relationality can have a variety of interpretations: psychoanalytical, physical, social and religious (Mamzer, 2005). However, irrespective of the interpretation, the essence always lies in placing the focus on experience and feelings, and it is this aspect which seems to be prevalent today in the context of understanding beliefs which guide contemporary societies when they engage in similar actions as part of a custom. Nowadays, duty culture is transforming into pleasure culture, "we are witnessing a decrease in the authoritarian nature of obligation" (Golka, 2005), while at the same time the right to "seek pleasure and entertainment" is gaining ground.

The transformation of the custom system (in the meaning adopted here: a specific belief reality behind actions taken as part of a custom) of post-modern societies is also linked with the suspension of the power of the "deferment principle" (postponing happiness, joy, putting aside money) and an increasing prevalence of beliefs in the "here and now" gratification. This could be concisely called a transition from the savings book society to the credit card society. We are living on "borrowed time", getting used to the life of a debtor living in the moment, not thinking that the good "now" will have to be paid for with a difficult "tomorrow" (Bauman, 2010). The spread of such beliefs has had a strong impact on the formation of collaborative consumption society and the redefinition of good as a value regulating economic practice.

The cognitive epoché of collaborative consumption society applies to a change in the transfer of cultural content and the type of sensitivity of recipients. Electronic communication media have changed the world not only in terms of the flow of content, services, communication, interaction, but also in terms of how reality is perceived, explored, constructed or how we come to know it (Glava & Baciu, 2015). Societies whose culture was previously based on words have turned to picture-based culture, where we are constantly bombarded (not only as consumers) with icons and pictograms (Burszta & Kuligowski, 1999). Quite often this is linked to the need for instant communication of specific content (as is the case with road signs), yet the suspension of *logos* as a way to understand reality brings about serious consequences in how individuals participate in culture or social life. In the word-based culture reality was approached with analytical, logical, rational thinking, with an emphasis on looking for arguments which will have the power (based on the best, most often scientific, description) to persuade others. The picture-based culture appeals to other modes of reception: emotionality, symbolism, brevity. The fact that even in traditional reason-based discourses of knowledge or information sharing (school education, academic and political debates) images are becoming more important than content and play, and games and emotions take priority over rational critique, is a powerful demonstration how much we respect the belief that this emotion and image driven way of cognising the world is the most effective way of learning about reality (Jääskä & Aaltonen, 2022).

In terms of the last type of epoché, the one related to language, we can distinguish between the traditional way of human communication on the one hand (Postman, 2002), based on the idea of agreement and orientation to the truth (where truth may be understood from its Aristotelian/"common-sense" perspective—as consistency of thoughts/judgment with reality, or from the coherence perspective—as a coherent system, or from the consensual perspective—as an agreement), and on the other hand, communication built on dissonance, incoherence, meaning reversal, communication which gives rise to multiple meanings, oriented towards quasi-truth, post-truth, discord, where irony, sarcasm, paradox or lie are an end in itself in the process of communi-

cation (Rorty, 1989). The language epoché of collaborative consumption society today is often a transition from the *bona fide* (in good faith) communication mode to the *non bona fide* (not in good faith) communication mode.

Sharing economy is generally understood as a new type of human business practice, undertaken also outside the professional realms, which may be an answer of the contemporary generation to social crises, an answer which current business models failed to provide (Botsman & Rogers, 2010). Some researchers see this new form of economic practice as a contemporary way of constructing public sphere values (in 4 dimensions: professionalism, efficiency, services, engagement) (Hofmann et al., 2019). When reconstructing the axiological dimension of sharing economy we can point to degrowth economy as its worldview background. From the cultural perspective, the concept of degrowth, first introduced by Jacques Ellul and popularised by Serge Latouche, may be understood as a change in economic values, a process where "the consumption focused on owning and flouting material goods" is replaced with "value-senses such as: creating social relations, solidarity, compassion" (Pogonowska, 2018). Sharing economy is intended to be built on the concept of degrowth, and actions taken within this practice are to be driven by other values than profit.

2. Methodology

The methodological framework for the study is based on a cultural perspective where culture is understood as a thought reality which regulates—at a supra-individual, social level—human behaviour, actions and activities (Banaszak, Kmita, 1994). This thought reality is made up of two types of beliefs: normative and directive. The former ones make values the objectives of our actions, so values become the sense of our activities—an individual takes an action in the hope that the action will generate or embody a specific value. Directive beliefs, in turn, apply to ways of pursuing the value set by normative beliefs. In the cultural perspective, values are seen as a signpost for human activity, being both a product and a regulator of human activity. In this approach values are not seen as absolute, they change throughout history and are subject to temporal and situational contexts, as well as cultural relativisation.

The rationale for choosing this research perspective is its usefulness in the axiological analysis of actions taken by users of new economy networks. The reconstruction of beliefs on sharing as a new economic practice may help to identify the values making up the axiological basis referenced by representatives of sharing economy. Humanistic interpretation (Kmita, 1973) is used as an explanatory procedure to perform an analysis of concepts and lists of values. The interpretation involves the construction of a response which will give the reason (sense) for taking a given action by an individual. Such explanation is underpinned by an assumption that the subject is rational (an individual

acts rationally). The first stage of humanistic interpretation is a description of knowledge, or beliefs guiding an individual when taking specific actions. The second stage involves using this information to reconstruct the individual's value system/hierarchy, which provided an axiological background for actions. Actions are functionally grounded in a lasting specific global state accompanying a given situation and providing a cultural context. Consequently, in my reconstruction of beliefs I am also going to rely on specific economic phenomena or processes occurring in contemporary collaborative consumption societies.

The analysis of the axiological aspect of applications, considered to be representative of sharing economy, was based on naturally occurring data, such as data published by individuals as their description of a company (white papers) as well as available social media posts/videos (Facebook, LinkedIn, Instagram, Twitter). This study was conducted in May 2021 and examined 21 profiles (white papers and social media posts) of companies declaring themselves as actors in the sharing economy. Examples were selected according to their belonging to the forms of consumption (clothswap & toyswap; couchsurfing; crowfunding; carpooling), distinguished by Ziobrowska (2017). I used a computer program called Atlas.ti to analyse qualitative data. In line with Gibb's findings (2008), I used concept driven coding. Consequently, to identify individual axiological "dimensions" I used the conceptual framework of white papers. The conceptual framework was used to identify extracts from descriptions of a given business entity which expressed, on the theoretical level, the same idea, the same reference to a value. The narrative analysis was based on two methods of qualitative data analysis: content analysis (limited to the analysis of concepts) and concept mapping. In this way specific axiological aspects could be assigned to individual business entities.

3. Findings: Axiology of collaborative consumption society

3.1. Shared good vs. ownership (owning and using)

The starting point for the reconstruction of beliefs making up the axiological background of collaborative consumption society should be the observation how the concept of good is currently being redefined and how the idea of shared ownership is spreading. For a long time ownership has been a key concept in business practice and economic thought: a concept which underlay the organisation of the practice and description of economic exchange, labour and social relations (Lai et al., 2022). Ownership was defined as a right to have, enjoy, use, derive profit from, process or destroy an object; in practice such an approach gave rise to a specific type of business activity where the ownership of an item was a prerequisite of using it. As new business practices have spread, the ideological link between owning and using has lost its power, and more and more

parties to business exchanges have started acting in line with a belief that one can use a thing without needing to own it (Mai & Ketron, 2022). What was noticed was that some types of ownership are not seen as being marketable, which means that they are not perceived as something that can make money or something that can be owned and—consequently—"something should be done about it". The spread of such beliefs has contributed to the emergence of prosumtpion on global markets, i.e. a new type of owning and using (producing and consuming) where individuals or communities are both producers and consumers of goods and services (Baruk, 2019).

The strengthening of beliefs that owning and using are not inextricably intertwined is functionally grounded in phenomena and processes which have created a specific context for business practice. One of them is technological support for sharing; contemporary societies have been "equipped" with efficient and effective global tools (platforms or applications) which enable widespread sharing of objects (goods, services, skills) with others. Today we no longer need to be socially and geographically close to the owner of an object or idea to be able to use it and share it (Poretski et al., 2021).

Another important phenomenon contributing to the cultural context of sharing economy is the emergence of new consumer attitudes (Das et al., 2009; Debevec et al., 2013). Social and economic crises at the beginning of the 21st century significantly increased consumer awareness and have made the ethical dimension of consumer choices much more prevalent. The choices are no longer an abstract concept discussed by the ivory tower of academia, but they actually "operate" in the process of consumption. A savvy consumer wants to take responsibility, to know the origin of goods, course of production, context, parties, exchange in order to be able to evaluate not so much the economic, but the moral value of an item and make a choice based on this information. New consumers are also believed to be in favour of the circular economy understood in opposition to the linear economy (profit- and progress-driven) (Su & Urban, 2021). The new consumer is supposed to act taking into account social responsibility (accommodating all stakeholders), sustainable development (the good of the planet) and future-oriented thinking (the wellbeing of future generations) (Francis & Sarangi, 2022).

The socio-cultural model of participation in social life has also evolved—what counts now is comfort, trust, belonging and interaction. The open system of social stratification and the "you can be whoever you want to be" principle translate, on the one hand, into availability and freedom of choice, but on the other hand, impose the terror of self-creation, the development of "reflexive forms of self-narration" (Giddens, 2006), when the choice of a specific lifestyle becomes a way of self-creation.

All the above phenomena create a specific context in which the beliefs providing the world-view background of business practices of collaborative consumption society can spread. Normative beliefs (NB) point to "good" as the

primary value to be pursued. In the context of consumption, this good is understood in two ways: as the good of an individual and the good of a community. Linguistically, this distinction could be reflected in contexts of meaning activated for the words *wealth* and *welfare***.** The use of these terms (understood from the late Wittgensteinian perspective, 2009) involves two types of wordplay: *wealth* is used mainly in the context of owning, while *welfare (sharing)* in the context of using. This difference in understanding gives rise to differences in directive beliefs (DB), resulting in opposing business practices/models.

In the first approach (NB 1: good as wealth), good is defined in relation to an individual; this is individualistic consumption. Directive beliefs, which specify how to pursue the value understood in this way, may be reconstructed as follows:

DB 1.1: To achieve wealth we must consume here and now.

DB 1.2: To achieve wealth we must create short-run terms of exchange.

DB 1.3: To achieve wealth we must create objects (products, services) in a way that is accessible and cheap.

Such a redefinition of good is gaining ground in societies through the narration of profit: all business activity must be geared towards maximum financial results, and the revenue is the key to all sorts of statements and breakdowns (financial, insurance, corporate social responsibility) for business activity.

In the second approach (NB 2: good as welfare, sharing), good applies to the community of consumption, based on shared use and sharing, and is described by the following directive beliefs:

DB 2.1: To achieve welfare we need to consume with the future in mind (leave something for the future).

DB 2.2: To achieve welfare we need to adopt a long-term timeframe for the terms of economic exchange.

DB 2.3: To achieve welfare we need to create things based on cooperation and social justice.

In business practice, the model where the latter normative and declarative beliefs are embraced by consumers includes activities described as sharing economy. The overarching question of the text, as is stated above, is whether such a conceptualisation of good (based on the ideas of community and justice) is really becoming socially grounded and is respected in the practice of sharing economy. To answer the question, I performed qualitative analysis of white papers and social media posts/videos published by the most popular sharing economy platforms and applications.

3.2. Business vs. world-view model of sharing economy

The analysis of the most popular platforms and applications categorised as sharing economy businesses (21 entities, including such giants as Uber, Lift, Airbnb, HomeAway, TaskRabbit, freelancer) revealed an axiological rift within the business practice, as is evident in the examples. In some cases, sharing economy

seems to be more than just a declaration, and the underlying idea of degrowth is also applied in the organisation, flow, access, relations and exchange, while in others, only some forms of sharing economy are adopted (access, ease of joining). The latter seem to be just a new method of attracting customers. The analysis of the axiological basis (understood here as a vision of the worldview reconstructed on the basis of white papers and the adopted system of values) of sharing economy businesses revealed two faces of sharing economy (sharing economy as a business model and as a world-view model) (Table 1).

Table 1. Business vs. world-view model of sharing economy

	Sharing economy as a business model	**Sharing economy as a world-view model**
Underlying idea	growth	degrowth
Objective	profit	other values: authenticity, transparency, not wasting, social bonds, cooperation, trust
Organisation of activities	control and hierarchy	peer-to-peer
Narrative used	emotions, social responsibility, inclusion of excluded groups, sustainable development, no/zero waste, ecology	rationality, figures, effectiveness, profitability, no/zero waste, ecology
Belonging based on	low prices/costs	identification
Examples	Uber, Airbnb	Lyft, NearDesk

Source: The author's own analysis.

A closer analysis of axiological dimensions of individual sharing economy entities demonstrated that in terms of values in a large number of cases we deal with different types of business practice which reinforce different understandings of shared good. In the business model, the redefinition of good as wealth is gaining ground, while in the world-view model the good is seen as welfare. For many businesses (be it business organizations or entities using/offering products and services) sharing economy operates only as a mode of doing business. Descriptions are full of emotions, "lofty" references to the philosophy of sustainable development (taking account of economic, social and ecological responsibility), yet when the values underlying the practices are reconstructed, quite often they prove to be just a form of PR, a way to build an image of a sharing economy business/app/platform. Businesses/users are supposed to be attracted by ease of access and related cheapness. In the pertinent literature there have been attempts for some time at separating the aspect of

easy access and cheapness afforded by the use of technology and building an exchange of goods on the basis of decentralised networks of trust and open access (Marchewka-Bartkowiak & Nowak, 2020). The term which captures this distinction in the meaning and which seems to be more and more often replacing the expression *sharing economy* is *access economy* (Jung, 2017). Broader terms, such as *on demand economy*, have also been used.

Humanistic interpretation, which focuses on explaining the meaning of actions in business exchange, is an effective way to establish whether for a given entity sharing economy is a business model or a world-view model. The reconstruction of the knowledge and value system underlying actions helps to reconstruct the value-assigning vision of the world, the vision which organises those actions. At the same time such reconstruction helps to show if the power of specific values is becoming weaker or stronger.

Conclusions

New ways of understanding the concept of good adopted in modern business practices are implemented as two separate models (business model vs. world-view model). In the axiology of the New Economy, sharing economy is currently a battlefield where two different redefinitions of good are "fighting" for dominance. The cultural background of the battle encompasses mainly technological changes in contemporary societies and the resulting acceptance for beliefs concerning pleasure, time and self-creation. Contemporary business models built on the post-crisis understanding of good as welfare (based on the ideas of community, degrowth, justice) can contribute to the social grounding of these values only when these values are actually adhered to, when businesses let these values guide their actions.

The axiological analysis of applications listed as representative of sharing economy shows that quite often the understanding of good as the community of consumption, focused on degrowth and the future generations and awareness of limited resources, is not becoming more widespread. Quite the contrary, it is becoming weaker. Moreover, the analysis also reveals that sharing economy, which grew out of the opposition against the consumption "drive" and the narration of profit, in a way substantiates the need to possess and the idea of growth to which it stands in opposition. This is because it offers a "humanised" path for the current growth-based beliefs. If this is actually the case, sharing economy may face a similar fate as the idea of stakeholders in the area of CSR, i.e. it will be treated as a convenient, easy to implement (as easy as a separate report drafted by corporate CSR specialists) way to counter any allegations that a business is not ethical. However, if ethical dilemmas surrounding sharing economy as a business model (e.g. criticism of Uber as a mobile application in the context of driver licensing, fair competition, taxa-

tion, safety, responsibility) continue to be discussed and present in the media, this also means that the counter-model will become more and more widespread. Zygmunt Bauman (1994) wrote that "Like vampires, values need life to replenish their life juices"; thus, the more "blood" of debate, embodiment, respecting a given value system, or a specific redefinition of good, the stronger the good/values themselves.

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Entrepreneurship as an occupational choice

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Abstract: This article aims to consider the entrepreneurship as an occupational choice and to understand the flow among different forms of occupations. Professionally active people may decide to start their own business or find hired employment as an option of professional occupation, the main difference being the fact that an entrepreneur makes entrepreneurial profits with the risk of failure, while an employed person receives risk–free remuneration. The choice of the form of professional activity depends on the perception of attractiveness of both forms, people who perceive entrepreneurial profits as more beneficial than workers' wages more likely decide to become entrepreneurs than waged employees. However, in the presented paper, the choice is considered not only between entrepreneurship and employment but also concerns the scale of entrepreneurship. When starting one's own business, people also need to decide whether they will hire employees and become proper entrepreneurs or whether they will abandon the idea of hiring employees and become quasi–entrepreneurs, also known as solo entrepreneurs.

The issue of entrepreneurship as an occupational choice is presented empirically using the time series data for Poland on a quarterly basis in the years 2003–2018. The influence of the overall economic situation, which determines business opportunities and average salaries, on the choice between a proper entrepreneur, a quasi–entrepreneur and a hired worker is presented with the use of regression analysis. The results show that changes in the overall economic situation and in the level of average wages lead to flows between proper entrepreneurs and quasi–entrepreneurs, and thus, to changes in the employment structure. Improving market conditions encourage people to follow the path of proper entrepreneurship or to become hired workers, while abandoning quasi–entrepreneurship. The deterioration of business opportunities, in turn, is the reason for the reduction of entrepreneurship and employment downsizing, at the same time leading to an increase in the number of quasi–entrepreneurs.

Keywords: entrepreneurship, occupational choice, proper entrepreneurs, quasi–entrepreneurs.

Introduction

Occupational activity is one of the things that define modern people and their place in the society. The choice of its form is a long–term decision which influences the quality of life of people and, often, their relatives. The choice be-

tween occupational activity and passivity may be viewed from the perspective of a variety of sciences, including psychology, sociology, law or economics. From the economic point of view, the choice between an entrepreneur and a worker dependents on the perceived benefits from both the forms of activity (e.g. the level of wages or profits, material benefits or social status) and the identified costs (e.g. the amount of work or financial resources necessary to be invested). If the benefits of being an entrepreneur outweigh those of being a wage worker, an individual`s rational decision is to run a business as a form of occupational activity rather than become an employee.

1. The occupational choice theory in explaining the entrepreneurship

Entrepreneurship is treated as one of the driven factors of economic development (Dominiak, Rekowski, 2009; Hopp, Martin, 2017) and the way to make economy more sustainable (Dhahri et al., 2021). Among different manners of understanding the entrepreneurship, the main schools combine its concept with innovation, risk taking or proactivity in exploring market opportunities (Freytag, Thurik, 2007; Grilo, Thurik, 2008). Understanding the entrepreneurship as innovation rooted in the works of Joseph Schumpeter, e.g., 1934), entrepreneurship as the willingness to take risks rooted in the works of Frank Knight (e.g. in: Emmett, 1999), while entrepreneurship as the discovery and exploitation of market opportunities—in the Austrian school of thoughts (e.g., Kirzner, 1997; Douhan et al., 2007).

In the narrow context, entrepreneurship is seen as a process of new company creation and development (Zapkau et al., 2017; Szerb et al., 2019) as within the start-up process all features of entrepreneurship (innovativeness, risk-taking and pro-activity) are combined, while entrepreneurs are people who chosen to run own business as occupational choice (Lechman, Dominiak, 2015; Pardo, Ruiz-Tagle, 2017).

One of the most important areas of a contemporary person's life is his or her occupational activity. When it comes to working age individuals, the logic of the approach of neoclassical economics requires making a choice between occupational activity and inactivity. Being occupationally active means being ready to take up a job, thus impacting the existing labour resource or labour supply. The decision to become occupationally active leads to taking another decision which refers to the form of occupational activity. One must distinguish between looking for employment (being unemployed), and being employed; while being employed—one must choose between hired employment and entrepreneurship.

From the perspective of labour market theories, it is about the choice between employment and unemployment. According to one of the labour mar-

ket theories, the job search theory, every individual can choose one of the following options: remaining at the current job place under the current conditions of employment and wage or becoming unemployed and searching for new employment on better terms than before (among others: Feinberg, 1978; Zaretsky, Coughlin, 1995). Thus, unemployment is seen as a choice of an individual who decides that looking for a new job is more beneficial than staying in the currently held job. In such circumstances, the costs of searching for a new job and the attractiveness of the available job offers are compared against the current terms of employment. In making such a choice the following variables play a role: the number of job offers on the labour market and their structure, the average wages, the amount of unemployment benefits, etc.

After entering the employment phase, the next stage is to make a decision about its form, i.e. a wage employment or entrepreneurship. Although the theoretical discussion and research results, there is no consensus about the reasons why people decide to run own business (Yang et al., 2017; Zapkau et al., 2017). The neoclassical approach to maximising utility offers the analysis of the reasons for entering into employment or entrepreneurship (McClough, Hoag, Benedict, 2014), under which assumptions the theory of occupational choice applies the comparison of the benefits and costs of both forms of activity (among others: Kihlstrom, Laffont, 1979; Bradley, 2016; Pardo, Ruiz-Tagle, 2017). According to this theory, an individual can either become a wage worker with a predictable and risk–free salary or an entrepreneur who makes entrepreneurial profits burdened with the risk of failure and of an uncertain amount. The choice of the form is made rationally depending on the anticipated net profits. The decision to become an entrepreneur happens when the individual finds that the benefits of becoming an entrepreneur outweigh the benefits of being a wage worker.

The list of benefits and costs connected with the choice between waged labour and entrepreneurship is quite extensive. The most important material benefits include remuneration for work and entrepreneurial profits. Wage workers are considered to be risk-free, while entrepreneurial profits are burdened with the risk of failure as it is impossible for the entrepreneur to anticipate making any profit, its amount or time of achieving it. The possible failure of the entrepreneur leaves also a negative imprint on their perception of social interdependencies and also impacts their mental condition. Non-material benefits of both forms of occupational choice include job satisfaction, feeling of independence, opportunity to fulfil one's own ambitions, occupational development and higher social status. According to the literature, particularly significant non-material benefits derived from being an entrepreneur include greater autonomy, more flexibility at work and better chances of successfully linking work and family life than it is the case in terms of wage workers (Bender, Roche, 2016). The costs involved in the process of choosing the form of occupational activity include mainly the costs of engaging financial and human capital. Every person doing their job, regardless of its form, devotes their time, applies their skills and expe-

rience, etc., which means that they engage their human capital. From the perspective of financial capital, the differences are quite remarkable. Conducting one's own business activity entails engaging financial assets in establishing and running the company, especially until the business finally starts making profits, while wage labour does not entail such costs. Furthermore, under the neoclassical approach, every choice is also accompanied by opportunity alternative costs.

Assuming the rationality and optimisation of decision, individuals choose such a form of occupational activity which secure them with the biggest net benefit possible, i.e. they maximise the difference between benefits and costs. However, as every person has a unique human capital and a different access to financial or social assets, despite the common assumption about making an optimal choice, the set of benefits and costs of each individual is different, resulting in making individual and unique decisions. Therefore, both the groups—entrepreneurs and wage workers—are statistically significantly heterogeneous (Brown, Farrell, Harris, 2011), which is the natural consequence of their unique expectations and possible investments to be made.

2. Factors determining the occupational choice

As self-employment exerts a positive influence on the economic well-being of local communities (Rupasingha, Goetz, 2013), it is important to understand the factors impacting the occupational choice. There is no consensus about those factors and the list is quite extensive (Nikolaev, et al., 2018; Dileo, García Pereiro, 2019). This list includes, for example, one's family situation, personality, education and experience as elements of human capital, nationality, ethnicity or health condition (Simoes et al., 2016; Reissova et al., 2020), factors linked with the subjective feeling of well-being, the feelings of happiness and satisfaction in life (Crum, Chen, 2015), the perceived instrumentality of wealth, the level of communitarianism, the need to feel accepted, the need for personal development, the need for escape and desire of independence, autonomy, wealth, challenge, etc. (Szarucki, Brzozowski and Stankevičienė, 2016). Summarising, three groups of factors can be distinguished: social-demographic factors, such as the age structure, share of men and women in the labour force, level of education; factors connected with the economic environment determining the levels of costs and profits involved in running one's own company; and finally, factors related to one's attitude towards entrepreneurship, showing one's readiness to become self-employed (Fritsch, Kritikos, Sorgner, 2015).

The occupational choice theory, as the main search criterion compares the level of entrepreneurial profit and hired wages, but it also points to several basic factors moderating the decision. As the occupational choice theory assumes that entrepreneurial profit is burdened with a risk of failure while wages are risk-free, one's attitude to taking risk is considered a major decision impacting

their choice of the form of employment (Gelderen van, Thurik, Bosma, 2006). A risk-taker is more likely to choose to become an entrepreneur, while a risk-averse person will tend to become a wage worker (Kihlstrom, Laffont, 1979; Banerjee, Newman, 1993).

Another group of determinants moderating the decision about the form of employment is access to financial capital (Seghers, Manigart, Uanacker, 2012; Reynolds, 2011), as individuals with access to financial capital are more likely to become entrepreneurs. However, in practice, access to capital is a complex issue, including an individual's ability to make savings, the levels of credit rating or access to financial assets over a time horizon. The impact of access to capital on the occupational choice decision is shaped by moral hazard, which leads to individuals acting in a more risky way, with less responsibility taken for their actions (Hyytinen, Vaananen, 2006; Blumberg, Letterie, 2008; Paulson et al., 2006), and information asymmetry, construed as a different set of information in the hands of the company owner or potential investor (Blumberg, Letterie, 2008). Consequently, individuals with their own financial capital are much more likely to use it themselves rather than lend it to others.

Another very significant factor moderating the occupational choice is the situation on the labour market. Entrepreneurship attracts employees with less chances of finding more attractive employment and those in less developed labour markets (Fitzpatrick, 2017). The level of wages in the given industry and their comparison against entrepreneurial profits is another factor, as one decides to become an entrepreneur only when entrepreneurial profits are at least as high as wages (Modrego et al., 2017).

Entrepreneurial motivation focuses on the factors and mechanisms through which an individual starts business activities. The literature provides two opposing theories of entrepreneurial motivation, the theories of entrepreneurial push and pull (Moulton, Scott, 2016; Krasniqi, 2014; Dawson, Henley, Latreille, 2014; Angulo-Guerrero et al., 2017). Under the push theory, also known as necessity-driven entrepreneurship, entrepreneurship is seen as an alternative allowing individuals to evade unemployment, psychological discomfort or some other adverse phenomena. The unemployed are more likely to start their own business activity than the employed (Andersson Joona, Wadensjo, 2013). The lack of job satisfaction is also regarded as one of the motivators pushing into entrepreneurship; however, research findings show that even though right after the formation of one's own business satisfaction levels soar fast, over time they begin to drop (Hanglberger, Merz, 2015; Georgellis, Yusuf, 2016).

Under the pull theory, also known as opportunity-driven entrepreneurship, starting one's own business results from the desire to make profits through realising one's own ideas (Startienė, Remeikienė, Dumčiuvienė, 2010). Under this theory, people become entrepreneurs as a result of positive motivation, such as the need for being independent, being one's own boss, the desire to fulfil one's own business ideas, the need for occupational challenges, which drives

them to achieve a better professional and financial position (Dawson, Henley, Latreille, 2014).

Furthermore, Caceres and Caceres (2017) have found gender differences in terms of entrepreneurial push and pull motivators, as wages is what pushes women to entrepreneurship stronger than men.

Research findings do not make it clear which of the types of entrepreneurial motivation plays a more important role in economic practice. Very often positive and negative factors mix with each other, jointly impacting the choice of the form of occupational activity. Findings show certain differences in activity levels after starting one's own business, depending on the individual's previous employment state. For instance, individuals who entered into entrepreneurship from the state of unemployment are more likely to close down their businesses than those who used to be employed (Millan, Congregado, Roman, 2012). Individuals previously employed as wage workers with relatively high amounts of remuneration are more liable to establish legal partnerships. Taken as a separate group, they fare better in rankings of newly started companies in terms of the turnover and number of employees (Andersson Joona, Wadensjo, 2013). However, these differences might result from the previously acquired knowledge, experience and network of business connections rather than from motivation to enter into entrepreneurship.

Starting one's own business, i.e. entering into entrepreneurship, often entails hiring employees and becoming an employer. The literature often differentiates between entrepreneurs-employers, known also as proper entrepreneurs, and the self-employed, known also as solo-entrepreneurs or quasi-entrepreneurs (Bennett, Rablen, 2015), saying that one only becomes an actual entrepreneur when giving employment to other people.

3. Research assumption: entrepreneurship as a choice of the form of occupational activity

The assumption of understanding the entrepreneurship as a form of occupational choice, alternative to employment, lead to formulating the research hypotheses on factors impacting this decisions. However, instead of limit the choice to entrepreneurship and employment, the presented research enlarges it by implementing two forms of entrepreneurship: quasi-entrepreneurship, meaning self-employed people without any employee, and proper entrepreneurship, being both entrepreneurs and employers.

The overall economic situation reflects the market opportunities impacting entrepreneurship. According to Austrian school of thoughts, an opportunity means a gap in the market, and the discovery and exploration of market opportunities (Kirzner, 1997) are made by the entrepreneurs through scanning the market for such unexploited opportunities (Hansen, Shrader, Monllor, 2011;

Gregoire, Barr, Shephard, 2010). The existence of such possibilities and their profitability in implementing them in running own business, but it also impact the possibility to employ workers. The average level of salaries available on the market is another determinant of the occupational choice, as it shows the attractiveness of waged employment comparing to entrepreneurship, however, the same time, average salaries are labour costs for entrepreneurs impacting their willingness to employ workers or not. These reflections lead to formulate two research questions:

RQ1: How do changes in overall economic situation measured by GDP impact the flow among occupational choices of proper entrepreneurship, quasi-entrepreneurship and hired employment?

RQ2: How do changes in average wages impact the flow among occupational choices of proper entrepreneurship, quasi-entrepreneurship and hired employment?

In order to refer to the above formulated research questions from the empirical perspective, empirical research was conducted on the basis of changes reported in Poland quarter by quarter between 2003 and 2018. The basis of the research was the data published by the Central Statistical Office in Poland in the form of time series. The data on entrepreneurship and unemployment was taken from "*Labour Force Survey in Poland*".

The dependent variables in the research are entrepreneurs divided into two groups: proper entrepreneurs (i.e. entrepreneurs hiring employees, entrepreneurs-employers, RPE) and quasi-entrepreneurs (i.e. self-employed, RQE). As the choice of occupational activity can also concern wage labour and entrepreneurship, hired workers (RHE) are taken as another dependent variable, allowing for making comparisons between the groups. In order to obtain data comparability, the author determined the rate of proper entrepreneurs, the rate of quasi-entrepreneurs and the rate of wage workers in the labour force construed as the total of the employed and the unemployed. Table 1 shows the rates of entrepreneurs and hired workers in the years 2003–2018.

Table 1. Descriptive statistics of the rates of entrepreneurs and wage workers

Rates	Average value	Minimum value	Maximum value	Standard deviation
Rate of proper entrepreneurs in labour force (RPE)	3.65	2.98	4.07	0.28
Rate of quasi-entrepreneurs in labour force (RQE)	13.45	12.73	14.64	0.44
Rate of hired employees in labour force (RHE)	72.52	62.13	79.05	4.77

Source: Author's own estimation in *Statistica.*

As the data in Table 1 shows, in the years 2003–2018 the average share of proper entrepreneurs in the labour force was 3.65%, quasi-entrepreneurs—about 13.45%, and wage workers—72.5%. The rate of proper entrepreneurs oscillated between 2.98% and 4.07%, with standard deviation of 0.28. The rate of quasi-entrepreneurs varied between 12.73% and 14.64%, with standard deviation of 0.44. Finally, the rate of wage workers was between 62.13% and 79.05%, with standard deviation of 4.77.

The independent variables are GDP in PLN (Polish currency) corrected with the Consumer Price Index (CPI) and average gross wages in the economy.

In order to linearise the connections between the variables, and in order to interpret the connections in terms of their flexibility, all variables were turned into natural logarithms. Then, correlations between the variables were determined and regression functions were set. The data showing the values of the coefficients of correlation between natural logarithms of dependent and independent variables is presented in Table 2.

Table 2. Parameters of the correlation between natural logarithms of dependent and independent variables

Variables	lnREP	lnRQE	lnRHE	lnRGDP	lnAW
lnREP	1.000				
lnRQE	–0.654	1.000			
lnRHE	0.839	–0.651	1.000		
lnRGDP	0.756	–0.759	0.899	1.000	
lnAW	0.749	–0.736	0.921	0.982	1.000

Source: Author's own estimation in *Statistica.*

The next step is to determine the parameters of the regression function along with estimating its fitting with the rates of entrepreneurs as dependent variables, GDP and average wages as independent variables by applying the OLS (ordinary least squares) method. The overall form of the regression equation is as follows:

$$\ln ROC_t = \beta_0 + \beta \ln IV_t \quad (1)$$

where:

$\ln ROC_t$ – natural logarithm of the rates of occupational choice over time t, substituted with lnRPE (rate of proper entrepreneurship), lnRQE (rate of quasi-entrepreneurship) and lnRHE (rate of hired employment)

$\ln IV_t$ – natural logarithm of independent variables over time t, substituted with lnRGDP and lnAW

β_0, β – regression function parameters.

The results of the estimation of regression function parameters in accordance with the overall equation (1) are presented in Table 3, with functions (2),

Table 3. Results of regression function estimation

Variable	lnRGDP Referred to RQ1	LnAW Referred to RQ2
Rate of Proper Entrepreneurship		
No. of regression function	$\ln RPE_t = \boldsymbol{\beta}_0 + \beta \ln RGDP_t$	$\ln RPE_t = \boldsymbol{\beta}_0 + \beta \ln AW_t$
β_0 (constant)	–0.352 (p = 0.056)	–0.861 (p = 0.001)
β	0.202 (p = 0.000)	0.266 (p = 0.000)
Model fitting information	R = 0.756 R^2 = 0.571 Adj. R^2 = 0.565 F(1.62) = 82.668	R = 0.749 R^2 = 0.561 Adj. R^2 = 0.553 F(1.62) = 79.075
Rate of Quasi–Entrepreneurship		
No. of regression function	$\ln RQE_t = \boldsymbol{\beta}_0 + \beta \ln RGDP_t$	$\ln RQE_t = \boldsymbol{\beta}_0 + \beta \ln AW_t$
β_0 (constant)	3.276 (p = 0.000)	3.467 (p = 0.000)
β	–0.083 (p = 0.000)	–0.107 (p = 0.000)
Model fitting information	R = 0.759 R^2 = 0.575 Adj. R^2 = 0.569 F(1.62) = 84.051	R = 0.736 R^2 = 0.542 Adj. R^2 = 0.534 F(1.62) = 73.333
Rate of Hired Employment		
No. of regression function	$\ln RHE_t = \boldsymbol{\beta}_0 + \beta \ln RGDP_t$	$\ln RHE_t = \boldsymbol{\beta}_0 + \beta \ln AW_t$
β_0 (constant)	2.608 (p = 0.000)	2.016 (p = 0.000)
β	0.205 (p = 0.000)	0.280 (p = 0.000)
Model fitting information	R = 0.899 R^2 = 0.809 Adj. R^2 = 0.805 F(1.62) = 261.87	R = 0.921 R^2 = 0.848 Adj. R^2 = 0.846 F(1.62) = 346.01

Source: Author's own estimation in *Statistica.*

(4) and (6) aiming to answer research question RQ1, while functions (3), (5) and (7)—research question RQ2.

As the results in Table 3 show, p value with all independent variables is below the significance threshold, i.e. these variables turned out to be significant from the statistical point of view in accounting for the changes in the rates of entrepreneurs and the rate of wage workers. The fitting of the regression function is also acceptable as the adjusted R^2 is above (0.5) for the functions describing the rates of entrepreneurs, and over (0.8) for the rate of wage workers.

Answering RQ1 based on regression function (2), it can be seen that the directly proportional impact of the overall economic situation, measured with GDP, leads to a change in the rate of proper entrepreneurs. As its results show, the parameter value for the regression function is (0.202), i.e. having obtained a positive parameter value, we can allow for a directly proportional correlation between the variables. Logarithmising primary data allows interpreting research findings as flexible, which proves that a one-off change in GDP leads to a change in the rate of proper entrepreneurs by 0.2.

Answering RQ2 on the basis of regression function (3), and assessing the parameter value of the regression function amounting to (0.266), we can assume that a one-off change in average wages leads to a directly proportional change in the rate of proper entrepreneurs by 0.27.

A comparison of the regression function estimation of the rate of proper entrepreneurs suggests that changes in the overall economic situation and average wages are those factors which exert a positive impact on the choice to enter into proper entrepreneurship. An improvement (deterioration) of market potential causes an increase (decrease) in the rate of proper entrepreneurs.

An analysis of another group of regression functions allows referring to the rates of quasi-entrepreneurs. Regression function (4) shows that changes in GDP impact in an inversely proportional way the changes in the rates of quasi-entrepreneurs, thus giving the answer to RQ1. This is certified by a negative parameter value (–0.083), which means that a one-off change in GDP influences a change in the rate of quasi-entrepreneurs by 0.083. Thus, it shows that the activity reaction impact of quasi-entrepreneurs is much smaller than that of proper entrepreneurs. Another regression function (5) allows answer RQ2. The value of regression function parameter (–0.107) suggests that a change in average wages leads to an inversely proportional change in the rate of quasi-entrepreneurs. As regards this function, like in the case of the above-mentioned function, the reaction impact of quasi-entrepreneurs is also smaller than that of proper entrepreneurs.

To sum up, the overall economic situation and the levels of average wages are those factors which in an inversely proportional way impact the activity of quasi-entrepreneurs. An improvement (deterioration) of market potential results in an increase (decrease) in the rate of proper entrepreneurs.

The final two regression functions allow referring to the impact of the market situation and average wages on the changes in the activity of wage work-

ers. An analysis of regression function estimation (6) lead to answer RQ1. The value of the regression function parameter is (0.205), which can be interpreted as a positive impact of the change in overall GDP measured economic situation on the changes in the rates of wage workers. The last of the estimated regression functions (7) refers to RQ2. The value of the regression function parameter (0.28) implies that the impact of changes in average wages in a directly proportional way results in changes in wage labour by 0.28.

Thus, considering regression functions for the rate of wage workers, it can be argued that changes in the overall economic situation and average wages exert a positive impact on the decision to enter into wage labour. An improvement (deterioration) of market potential results in an increase (decrease) in the rate of wage workers.

A comparison of all the estimated regression functions reveals that changes in the market situation exert a positive influence on the decision to enter into proper entrepreneurship and wage labour, while a negative influence with regard to quasi-entrepreneurship. This suggests that more beneficial business opportunities encourage entrepreneurs to tap on them by, among other things, hiring a bigger number of wage workers. Thus, quasi-entrepreneurs join the now growing group of proper entrepreneurs, at the same time leading to an increase in the strength of wage workers. Reversely, when the market is experiencing a downturn, some proper entrepreneurs reduce their business activity and lay off wage workers. Thus, they move to the group of quasi-entrepreneurs, which now is growing, with a drop in the overall numbers of wage labour. Shifts in the employment of wage workers seem to exert a moderating impact on the changes in entrepreneurship rates in terms of the occupational choice. The above shifts are shown in Figure 1.

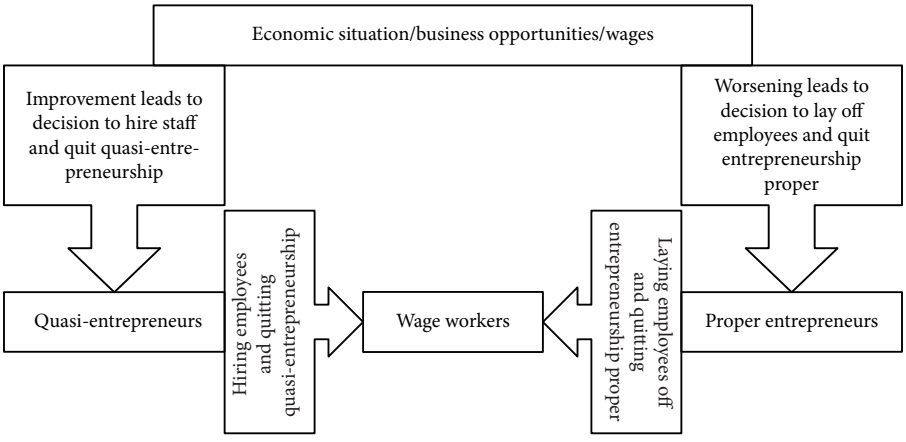

Figure 1. Shifts among proper entrepreneurs, quasi–entrepreneurs and wage workers

Source: Author's own elaboration.

A comparison of the absolute values of regression function parameters and the degree of function fitting suggests that wage workers react more strongly than entrepreneurs to changes in the market situation. This can be accounted for with the costs and barriers of entering and going out of the market that entrepreneurs would have to incur in order to adjust to the improving or worsening market opportunities.

To sum up, it can be found that the adopted research method and the data used support the research hypotheses, which cannot be rejected. Thus, research findings suggest that, depending on the changes in the market situation, individuals make their occupational choices between entrepreneurship and wage labour. Furthermore, through the decisions to either hire or lay off staff there occur shifts between the groups of quasi-entrepreneurs and proper entrepreneurs.

Conclusions

The occupational choice between being an entrepreneur and a worker is a long-term decision which can be analysed in the light of the potential benefits and costs obtained and involves seeking rationality. If an individual can recognise that the benefits of being entrepreneur outweigh those of being a wage worker, they will choose to run their own business as a form of occupational activity rather than become hired employees. The novelty of the presented attitude is that the choice is considered not only between entrepreneurship and employment but also the scale of entrepreneurship, distinguishing between proper entrepreneurs (entrepreneurs-employers) and quasi-entrepreneurs (self-employed). When starting one's own business, people also need to decide whether they will hire employees and become proper entrepreneurs or whether they will abandon the idea of hiring employees and become quasi-entrepreneurs.

The research questions ask the influence of the overall economic situation, which determines business opportunities and average salaries, on the choice between a proper entrepreneur, a quasi-entrepreneur and a hired worker. Based on the time series data for Poland on a quarterly basis in the years 2003–2018, the flows between the forms of occupational choices are analysed. The flows between proper entrepreneurs and quasi-entrepreneurs connected with decisions to either hire or lay off staff are crucial to moderate the occupational choice, and thus, to changes in the employment structure. The recovery of the market situation encourages people to follow the path of proper entrepreneurship or to become hired workers, while abandoning quasi-entrepreneurship. The recession of business opportunities, in turn, is the reason for the reduction of proper entrepreneurs and employment downsizing, at the same time leading to an increase in the number of quasi-entrepreneurs.

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Impact of government spending and corruption on foreign direct investment in Indonesia

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Abstract: Investment is a critical macroeconomic variable for economic growth and development in any country. As a developing country with the fourth largest population in the world, Indonesia is also dependent on investment coming in from both home and abroad. A good investment climate is one of the solutions in overcoming economic problems so that foreign investors can invest in Indonesia. Obviously, various factors influence investors' willingness to invest in Indonesia. The purpose of this study is to examine the impact of government spending, corruption, economic growth and wages on foreign direct investment in Indonesia. The study uses Ordinary Least Square (OLS) multiple linear regression analysis for the research period 2000–2020. The results show that the variables of government spending, corruption and economic growth have positive and significant impact on foreign direct investment, while the variable of salary has negative and significant impact on foreign direct investment. The Indonesian government needs to reduce the level of corruption and wage level to attract investors.

Keywords: foreign direct investment, government expenditure, corruption.

Introduction

Investment is a critical macroeconomic variable for economic growth and development in every country. Investment consists of private investment and public investment (Brima & Brima, 2017). Indonesia as a developing country with the fourth largest population in the world also depends on incoming investment both from within the country and from abroad. Private investment is one of the helpers in the economic development of the country.

This is due to limited funding or resources owned by the country in carrying out economic development activities. Investment can be used as a source of financing to cover limited financing in Indonesia's economic development (Thirafi, 2013). A good investment climate is one solution in overcoming economic problems so that foreign investors can invest in Indonesia. As a developing country, Indonesia obviously requires large funds to carry out economic development in all sectors and catch up with developed countries. Thus, the existence of foreign direct investment should be utilized as well as possible by Indonesia.

Foreign Direct Investment (FDI) is very helpful for Indonesia in implementing national development. Previous research in Nigeria by (Faroh & Shen, 2015), states that FDI can be part of promoting economic growth in developing countries (*host country*), such as labour training, market development, *financial inflow*, technology transfer and skills.

In order to support the creation of a good investment climate, the role of the government is needed. The government with its public spending is an extraordinary government economic instrument (Le & Suruga, 2005). Public spending is used to manage public interests, such as education, health, social security and infrastructure, which are very important to attract FDI (Montagna & Molana, 2005). The Indonesian government for the last few years has been aggressively carrying out investment promotion activities to various countries in the world. The Indonesian government offers convenience in investing in Indonesia which is expected to encourage foreign investors to invest in Indonesia.

To support this effort, the Indonesian government established the Indonesia Investment Authority (INA) on February 16, 2021 and the Ministry of

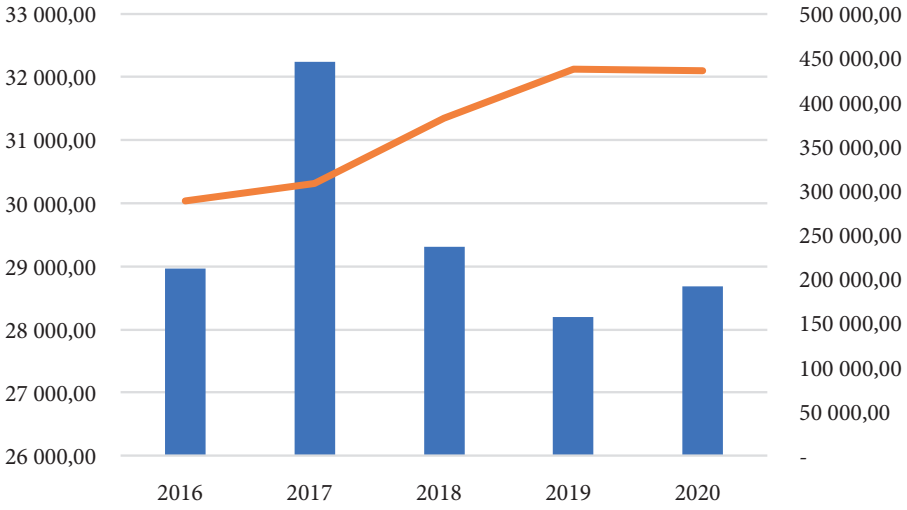

Figure 1. FDI and government expenditure
Source: (Central Statistics Agency and Ministry of Finance, 2021).

Investment. The INA is a generic issue investment institution and invests by co-investment with investor partners, both domestic and foreign. The investment objective of the original Indonesian *Sovereign Wealth Fund* (SWF) is to manage domestic assets that are deemed necessary for development. Looking at Figure 1, it can be seen that there was an increase in foreign direct investment from 2019 to 2020 despite the COVID-19 pandemic. The Indonesian government still aims to prevent the COVID-19 pandemic from disrupting economic stability too deeply, so that the budget allocation for economic functions is sought to remain stable. It can be seen from the government spending that it decreased slightly from Rp437,540 billion to Rp435,969 billion.

In 2021, the Indonesian government is optimistic to increase investment. Based on Bappenas data, investment realization in 2021 is targeted to reach Rp858.5 trillion, higher than the 2020 realisation target of Rp817.2 trillion. This optimism is supported by the implementation of the Job Creation Act and the expected more conducive employment climate.

The desire of investors to invest in Indonesia is obviously influenced by various factors. Economic growth is one of the factors that affect foreign investment. The long-term growth rate in a country will improve the economic situation in that country (Sournia and Benhabib Abderrezzak, 2013). A good GDP growth rate will have a positive effect on the country because it will attract investors to invest (Shahzad & Al-Swidi, 2013). However, according to (Jayachandran & Seilan, 2010), high or low economic growth rates have no effect on the existence of FDI, based on research that has been done.

In addition, corruption has been identified as a variable that determines FDI inflows. Corruption is known as an international problem because it is an economic and social problem that affects every country in the world (Argandoña, 2006). Misuse of public resources for private gain is classified as corruption (Myint, 2000). Therefore, the effects of corruption can lead to a reduction in the amount of investment, can cause economic growth to stagnate, prevent prospective job opportunities due to FDI inflows and inefficient use of limited government resources (Hossain, 2016).

A recent study by the IMF (2018) shows that corruption and poor governance are associated with higher inequality and lower inclusive growth, while (United Nations Conference on Trade and Development (UNCTAD), 2017) reports that total world FDI inflows reached US$1.75 trillion in 2016, of which only 37% flowed to developing countries. Countries that attract larger FDI inflows find it easier to implement investment projects and achieve economic development and growth. According to the OECD (Organization for Economic CoOperation and Development) report, a 1% increase in corruption will reduce economic growth by 0.73%, and as a result of corruption it has an impact on an increase of 10% in business costs (Makhlouf, 2016:36).

Therefore, many countries are adopting investment measures and carrying out legal and institutional reforms to attract more FDI into their economies.

Compared to the benefits of domestic investment in creating jobs, FDI can enhance or maximize some of the benefits that domestic investment has generated in developing countries. For example, FDI inflows to developing countries can introduce more advanced technologies, managerial and marketing practices. Partnerships with foreign investors also help companies in developing countries to benefit from better market access and increased market share, to reduce costs and to exploit natural resources (Gerschewski, 2013).

In Transparency International's report released on 28 January, 2021, Indonesia's 2020 corruption index (CPI) fell to 102 out of 180 countries. In 2019, Indonesia ranked 85. This downgrade shows that the level of corruption in Indonesia is increasing. This is of course a threat to the increase in foreign direct investment in Indonesia.

According to the World Bank (2017), foreign direct investment has become the largest source of external financing in developing countries. However, although FDI inflows to developing countries continue to increase every year, its quality and role in achieving sustainable economic growth is still questionable. For example, (Sadik & Bolbol, 2001) show that the quality of FDI in developing countries is very poor and the technological spillovers arising from FDI inflows have not been seen. Finally, the FDI flows to Arab countries are considered to be very weak compared to the rest of the world (Krogstrup & Matar, 2005).

1. Literature review

Research on government spending with foreign direct investment is discussed in (Ul Husnain et al., 2011) which looks at government spending, foreign direct investment and economic growth using the *Simple Accounting Framework*. This study shows that government spending inhibits economic growth, which then has an impact on Foreign Direct Investment. In addition, (Umar & Alabede, 2017) looked at the impact of capital expenditure on foreign direct investment in Nigeria using the *Ordinary Least Square* (OLS) method. The results show that capital expenditure has a negative effect on foreign direct investment. In the ASEAN region itself, research on the impact of government spending on foreign direct investment was carried out by (Othman et al., 2018) using panel data and a pooled mean group. The result is that government spending has a positive impact on foreign direct investment in the long run.

There have been several studies on the relationship between economic growth and foreign investment, for example (Asiamah et al., 2019) conducted research on the determinants of Foreign Direct Investment in Ghana using the causal research design method. This study gives the result that the gross domestic product has a positive effect on Foreign Direct Investment. Another view but the same result was put forward by (Kubo, 2019) who con-

ducted research on the determinants of Japanese Foreign Direct Investment in Southeast Asia for the 2008–2015 period, using the regression method and industry-specific panel data.

Another study was conducted by (Kakoti, 2019) regarding outward Foreign Direct Investment in India for the period 1980–2016. Using the ARDL *(Autoregressive Distributive Lag)* model, it was found that the gross domestic product had a positive and significant effect on the outward movement of Foreign Direct Investment in India. The same results and methods were also carried out by (Mokuolu, 2018) in India, (Na & Lightfoot, 2006; Okafor, 2012; Siddiqui & Aumeboonsuke, 2014).

Many researchers have found a link between corruption and foreign direct investment. (Gasanova et al., 2017) identified that corruption affects a country's investment attractiveness. (Bayar & Alakbarov, 2016) found that in some countries corruption has a negative impact on FDI, while in other countries it has a positive impact on FDI.

Several studies have reported a negative relationship between FDI inflows and corruption. According to Transparency International (2017), no country in the world is free of corruption, which means corruption is a worldwide problem and affects the economy in different ways. For example, corruption affects people's trust in their government. It also affects living standards by causing a loss of economic resources, reducing incentives to work, allowing people to be less productive, and it can increase the cost of doing business for investors.

(Egger & Winner, 2005) found that corruption is positively correlated with the level of FDI in the host country, while Gutierrez (2015) argues that corruption has no effect on FDI inflows because it is concentrated in capital-intensive industries related to the exploitation of natural resources.

On the other hand, corruption is considered to have an adverse impact on FDI inflows (Al-Sadig, 2009; Castro & Nunes, 2013; Epaphra & Massawe, 2017; Hossain, 2016; Quazi et al., 2014; Smarzynska & Wei, 2000). In contrast, other studies report that corruption does not appear to hinder FDI inflows (Biglaiser & Jr., 2006; Quazi et al., 2014).

The minimum wage has become one of the main problems in Indonesia as workers demand an increase in the minimum wage, and this demand occurs every year. This creates a major impact on employment and worker well-being in the medium- and long-term – productivity on the worker side and financial performance and FDI on the enterprise side. First, the minimum wage will grow faster than inflation and productivity. Second, government intervention in setting wages can hinder the collective bargaining process between employers and trade unions. Third, the demand to increase the minimum wage every year substantially affects foreign direct investment in Indonesia and a large number of foreign direct investors have withdrawn their investment due to high labour costs (Tambunan, 2006). Another study conducted by (Dewata & Swara, 2013)

showed that labour wages had a negative and significant effect on foreign direct investment in Indonesia in 1990–2012.

Different results were presented by (Hayami et al., 2012), who conducted a study in Japan and found that workers receive premium income if they work with companies that engage in outbound FDI which involves ownership of at least 50% in some foreign companies. Workers with higher ranks benefit more, yet even some non-managerial workers may benefit. These wage benefits are highly dependent on the level of ownership in the FDI project. On the other hand, the increase in foreign employment is not beneficial for the workers' wages unless they are at the highest rank.

2. Methodology

The data collected and used in this study is secondary data, including mainly the data on the government spending, corruption perception index, wage rate, economic growth and foreign direct investment for the period 2000–2020.

Data sources come from the Indonesian Central Statistics Agency (BPS), the Ministry of Finance of the Republic of Indonesia and Transparency International.

Research variables

- Government spending is the percentage of central government spending to total state spending in percent (%) sourced from the State Budget (APBN).
- Corruption is the Corruption Perception Index with index units sourced from Transparency International. The corruption perception index uses a scale from 0 to 100, where 0 indicates a very high level of corruption and 100 indicates a very clean level of the public sector.
- The wage rate is the average growth rate of Indonesia's minimum wage in percent (%) sourced from the Central Statistics Agency.
- Economic growth is the aggregate development of income from a certain time to the previous time in units (%) sourced from the Indonesian Central Statistics Agency.
- Foreign Direct Investment is the realisation of investment activities to carry out business in the territory of the Republic of Indonesia carried out by foreign investors, both those who use fully foreign capital and those in joint ventures with domestic investors in US dollars (US$) sourced from the Central Agency of Statistics (Statistics Indonesia).

In this study, a multiple linear equation model will be used using the *ordinary least square* (OLS) regression technique to see the relationship between government spending, corruption, wage levels and economic growth on foreign direct investment. Thus, the general specifications of the structural equation system used in this study are:

Functional Form

$$Y = f(X_1, X_2, X_3, X_4) \tag{1.1}$$

where:

Y = Foreign Direct Investment
X_1 = Government Expenditure
X_2 = economic growth
X_3 = corruption perception index
X_4 = wage rate

3. Results and discussion

Based on the results of the ordinary least square data processing, it can be seen that:

- The government expenditure variable has a positive and significant effect on foreign direct investment in Indonesia. This can be seen from the coefficient value of 0.000633 with a probability of 0.0009, which is smaller than 0.05 (α). These results indicate that the increase in government spending can increase foreign direct investment in Indonesia. This government expenditure is related to the improvement of facilities and infrastructure, telecommunications and various things that encourage the attractiveness of foreign investors to invest in Indonesia. The results of this study are in line with the research conducted by Othman et al., 2018 in the ASEAN region. By seeing results like this, it is certainly hoped that the government will maintain performance in the allocation of government expenditures, where government spending should be more focused on programs that support the improvement of infrastructure and infrastructure development. Investors will certainly prefer a host country with more complete facilities so that they no longer need to spend money to support their investment activities.
- The variable of economic growth shows a positive and significant effect on foreign direct investment, as seen from the coefficient value of 0.089197 with a probability of 0.0187. These results indicate that the increase in Indonesia's economic growth will also encourage an increase in foreign direct investment in Indonesia. Economic growth shows the condition of the economy and becomes a benchmark in assessing the economy of a country. Of course, every foreign investor will first see the economic performance of the country that they will make as an investment destination. The current state of the COVID-19 pandemic has certainly disrupted the economic conditions of every country, including Indonesia. However, based on the data, it can be seen that Indonesia's economic growth only contracted by 2.10%. This shows

that the Indonesian economy can still survive in a pandemic condition and is currently trying to rise together with other countries. The results of this study are in line with Asiamah et.al, 2019, who conducted research in Ghana, and Kubo, 2019, who conducted research in Southeast Asia.

– The corruption variable shows a positive and significant effect on foreign direct investment in Indonesia, as seen from the coefficient value of 0.114029 with a probability of 0.000. These results indicate that the higher the value of the corruption perception index, the higher the foreign direct investment. The corruption perception index is an index where the higher the value with a maximum of 100, the cleaner the country is. Based on these results, it can be seen that foreign direct investment will increase if corruption decreases and the country becomes cleaner. In 2020, Indonesia's corruption perception index of 37 decreased compared to 2019 when it was 40. The Indonesian government needs to take a stand in fighting corruption in Indonesia if it wants foreign direct investment to increase. Eradication of corruption needs to be carried out in all lines of the public sector in order to create a corruption-free country.
– The wage variable has a negative and significant effect on foreign direct investment, as seen from the coefficient value -0.021808 with a probability of 0.0304. These results indicate that an increase in the workers' wages in Indonesia will encourage a decrease in foreign direct investment. Wages are an indicator of the workers' welfare so they always want an increase in wages from year to year. However, for investors, an increase in wages will of course increase the costs they have to spend. Therefore, investors also look at the prevailing wage rates in the host country. In determining the wage level, government intervention is needed to keep the wage level in line with the inflation rate in the country so that investors can understand the reasons for the increase in the wage level. The results of this study are in line with Dewata and Swara, 2013 who also conducted research in Indonesia.

Table 1. Results of ordinary least square

Dependent variable: Foreign Direct Investment				
Variable	**Coefficient**	**Standard error**	***t*-Statistic**	**Probability**
C	15.62975	1.338405	11.67789	0.0000
Government Expenditure	0.000633	0.000156	4.060034	0.0009**
Growth	0.089197	0.034092	2.616367	0.0187**
Corruption	0.114029	0.010473	10.88834	0.0000***
Wage	–0.021808	0.009185	–2.374291	0.0304**

Source: Eviews Data Processing Results.

To support the results of the OLS, the following tests were carried out:
a) Normality Test

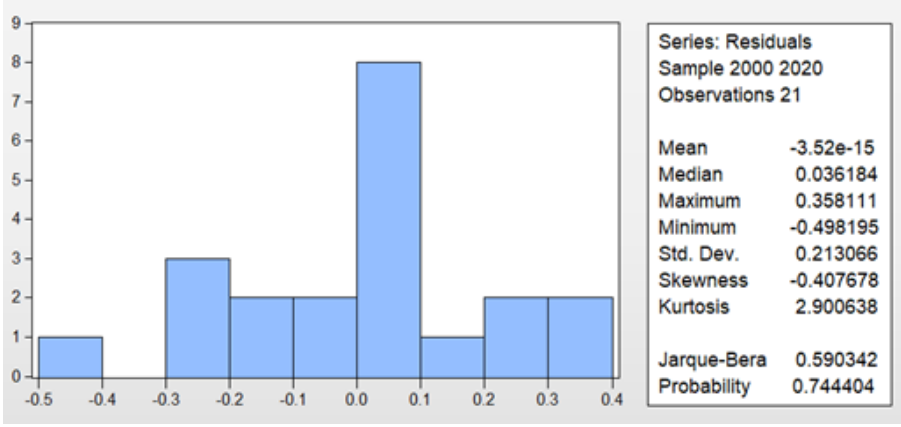

Figure 1. Normality Test
Source: Eviews Data Processing Results.

Based on Table 2, the probability of 0.744404 is greater than 0.05, which indicates that the data used is normally distributed.

b) Multicollinearity Test

Table 2. Multicollinearity Test

Variance Inflation Factors			
	Coefficient	**Uncentered**	**Centered**
Variable	Variance	VIF	VIF
C	1.791328	662.9127	NA
Government Expenditure	2.43E-08	425.2558	2.014304
Growth	0.001162	11.60597	1.236727
Corruption	0.000110	35.09046	2.178635
Wage	8.44E-05	7.523167	1.475014

Source: Eviews Data Processing Results.

Based on Table 2, the value of centred VIF for the variables of government spending, economic growth, corruption and wages is less than 10. This shows that there is no multicollinearity.

c) Heteroscedasticity Test

Table 3. Heteroscedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.711659	Prob. F(4,16)	0.5959
Obs*R-squared	3.171886	Prob. Chi-Square(4)	0.5295
Scaled explained SS	1.749800	Prob. Chi-Square(4)	0.7817

Source: Eviews Data Processing Results.

Based on Table 3, the probability value is above 5% or 0.05 indicating that there is no heteroscedasticity.

d) Auto Correlation Test

Table 4. Auto Correlation Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.210503	Prob. F(2,14)	0.8127
Obs*R-squared	0.613073	Prob. Chi-Square(2)	0.7360

Source: Eviews Data Processing Results.

Based on Table 4, the Prob Chi Square(2) value which is the *p*-value of the *Breusch-Godfrey Serial Correlation LM* test, amounting to 0.7360 > 0.05, which means there is no autocorrelation problem.

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What to look for to increase work added value? Remote work and perceived productivity: A study in Poland, Hungary and the Czech Republic

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Abstract: In the era of digitisation, the role of remote work is growing. The digitisation of work has brought new opportunities and threats to the economic function of labour. This function, pointing to the fundamental role of employment, which is to provide added value for the employer and remuneration for the employee, has acquired a new meaning. Therefore, in the era of digitisation, it seems justified to assess the impact of remote work on labour productivity (in terms of organizational factors, cost factors and work quality). The subject of the study is to analyse the productivity factors of remote work (based on work performed under permanent and short-term employment, including various work models and irregular work patterns). The main objective of the research is to identify factors determining perceived productivity of individual workers who perform their job remotely and to measure the importance of factors determining labour productivity. The methodology used in the study is based on the analysis of the literature and conclusions drawn from a survey conducted in Poland, the Czech Republic and Hungary (a total sample of 450 units). Logistic regression and the k-means method were used in the statistical analysis. They allow measuring the relationship between the strength of a stimulus represented by the percentage of cases showing a specific response on how productivity is verified by the stimulus. Moreover, they bring the possibility to group factors in clusters representing workers with different sets of productivity factors.

Results show that across the study sample, high stress, low employee control, and limited communication with managers minimise the growth of remote work productivity, since social relationships at work are correlated with productivity. Nonetheless,

work organisation traits such as proper work environment, travel cost savings, technical assistance access, and a fast Internet connection remain positively related to remote work productivity.

Keywords: remote work, productivity, work digitisation, labour mobility, organisation.

Introduction

The spread of new forms of employment is facilitated by the widespread use of the Internet and algorithms supporting communication. As part of the new solutions in the area of employment, in addition to the classic form of full-time employment, we can find solutions that involve sharing a job between several employees or sharing an employee by several non-competing employers. In addition, there is voucher work, i.e. a situation when an employee buys a job with an employer from an intermediary organization. However, the most widespread form is self-employment and its various modifications, known as quasi-self-employment. There is also a type of work done simultaneously for many clients called 'portfolio work' and 'interim management' work done on a short-term basis. The work performed in this form is usually project-based and task-based. Robots and algorithms are employed for repetitive tasks. Less complex jobs, such as cleaning or transporting people, are short-lived, and workers struggle with job insecurity. In contrast, more skilled tasks allow for more autonomy in choosing assignments, and the people doing such work have expertise or specific skills. The use of these types of employment would not be possible without the Internet. Remote work has emerged with the convenience of remote connectivity. The application of such a solution may include all or part of the work process, such as contact with the manager. Remote work, otherwise known as telework, can therefore be treated as a common denominator of new forms of employment. According to Eurofound (2021), teleworking became more widespread during the COVID-19 pandemic in all EU countries, and on average one in three Europeans took up this type of work already at the beginning of the pandemic, many with limited or no previous experience. By July 2020, almost half of the respondents were teleworking at least part of the time and a third were working exclusively from home. It can be said that this form of work has become widespread, which has brought a number of benefits, but—unfortunately many problems, revealing shortcomings in the regulation of work rules, technical adjustments, as well as the proper conduct of the norms of dialogue and agreement both at the level of companies, social organizations, and state institutions. Working remotely has revealed many inconveniences with which the employee is struggling to maintain the proper level of productivity. In the course of the pandemic and the growing pressure to work remotely, there have been discussions in Western European countries such as France, Spain, and Italy about regulating the need for employees to disconnect from the network.

Some of the many phenomena observed were extended working hours, leading to a disruption of the rest time rhythm and work-life balance system. This was compounded by occasional connectivity problems and obvious limitations in the flow of communication due to the mediation of digital technology. In employees, this caused alienation accompanied by stress and decreased motivation.

In this study, the aim is to identify factors determining labour productivity of individual workers who perform their jobs remotely and to measure the importance of factors determining labour productivity. The results of a survey conducted among people working remotely in Poland, the Czech Republic and Hungary have been used. The research hypothetical relationships have been extracted and statistical tests indicated significant relationships between productivity and its factors. The results have been analysed to answer the following questions: Which of the organizational factors, work quality factors and cost factors cause changes to productivity? Which factors have relatively the greatest impact on productivity and why? The statistical analysis used the logistic regression and the k-means methods. They allow measuring the relationship between the strength of a stimulus represented by the percentage of cases showing a specific response on how productivity is verified by a stimulus.

1. Theoretical background

The investigation began with a search of three prominent online databases and identified 153 articles that met the general criteria of interest (listed in Table 1) published between 2010 and 2021. After reading the abstracts of the prequalified articles, the authors classified 53 papers as relevant to this work and thoroughly analysed them in terms of their methods, hypotheses and results of empirical analyses. The reviewed articles have been published in different open access academic journals.

Tab. 1. Criteria for systematic literature review and statistics

Database	Wiley	Proquest	SAGE
Search criteria	Labour productivity and remote work in the title or abstract		
Publication year	2010 and beyond + selected older articles		
Abstracts	22	70	82
Full text articles	12	20	20

Source: Own research.

Based on the literature review, it has been found that productivity is not everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability

to raise its output per worker, as Krugman writes (1997). Meanwhile, reallocation of labour and wage levels are considered to be responsible for productivity growth. Productivity increases with the reallocation of total labour resources (Mussini, 2018; Andrews & Hansell, 2021). Hence, it is believed that reallocation of workers is a measurable factor of productivity change. However, mobilities related to remote work have shrunk during the pandemic, which means that remote forms of communication and work have taken centre stage (Matthews, See & Day, 2020). In the literature, many authors focus on analysing the benefits and costs of remote working from the point of view of a firm and from the teleworker's perspective. For example, cost savings on office space is often indicated as the main benefit and the bottom-line reason for telecommuting (Allen et al., 2015), while the negative impact of long-term remote work on relationships among co-workers and teams is often indicated as one of the costs of working from home (Bao et al., 2020). The impact of remote work on productivity is widely discussed in the literature (Wamboe, Adekola & Sergi, 2014; Filippetti & Peyrache, 2013; Muhanguzi & Kyobe, 2017; Patel et al., 2021). Maintaining the efficiency and effectiveness of the workforce is critical and new research suggests that productivity and efficiency have not suffered in the face of the current global situation (Bernstein et al., 2020). Choudhury, Foroughi, and Larson (2020) point out that working remotely from any location yields up to 4.4% increase in output, greater than working remotely from home, conditional on the use of ICT. It is worth noting that in the work process, these devices are characterised by ubiquity, context sensitivity, identification functions, and command and control functions. They enable continuous monitoring of individual workers and the environment, and networked worker solutions provide contextual information and decision support, as well as lead to taking control of the worker (Kreyer, Pousttchi & Turowski, 2003). Managers should introduce these technologies by engaging employees to avoid using technology in unexpected ways. For example, employees may purposely delay responses to their managers' requests and bypass control by setting up a second monitor where they do non-work-related tasks (Miele & Tirabeni, 2020). Filippetti and Peyrache (2013) refer to the convergence that is related to productivity in the economy. They note that the countries of Central and Eastern Europe have indicated significant differences in the levels of labour productivity compared to Western European countries, which can be largely attributed to differences in the technology gap. An essential aspect is also the variation at the national level in work-from-home opportunities, which is substantial across Europe. It varies between transitional economies (e.g. Romania) with only a small proportion of workers who may be able to work from home, on the one hand, and high-income northern countries (Norway, Iceland, Denmark) and the Netherlands where half or more of the workforce have worked from home in the past. Proportions are also strikingly low in some Southern Mediterranean countries (Reuschke & Felstead, 2020). Focusing on the standard assumption about the relationship

between wages and productivity, empirical studies have shown that deunionisation with a decreasing share of the labour factor in wages and globalisation have a negative impact on productivity (Judzik & Sala, 2013). Most studies concentrate on analysing the relationship between remote work and firm or employee productivity. In both cases, the nature of the relationship is not clear in the literature. Some authors point out that remote work may cause a decrease in firm productivity (Ganguly et al., 2020). Others present findings that suggest the opposite, namely that telework may increase firm productivity (Sánchez et al., 2007; Sandoval-Reyes, Idrovo-Carlier & Duque-Oliva, 2021), which in both cases results from managerial practice and a strategy of work organisation at the company. There have been recent developments in building digital enterprise structures that enable more productive and efficient remote working (Bryant, 2021; Hughes, 2008). Researchers investigating the productivity of employees working remotely aim to formulate measures that relate to work outcome and workload (Butler et al., 2021; Bao et al., 2020; Karl, Peluchette & Aghakhani, 2021; Evans et al., 2021; Kelliher & Anderson, 2010). For example, Kordalska and Olczyk (2020) identify productivity by the logarithm of the share of annual sales and the number of permanent full-time employees. Since indirect information about employee productivity is difficult to measure, many studies looked at self-reported productivity and satisfaction (Butler et al., 2021; Evans et al., 2021). Most studies use questionnaires in addition to face-to-face interviews as the main research tool (Blasi & Kruse, 2006; Osterman, 1999; Muhanguzi & Kyobe, 2017). In the questionnaire, the teleworkers are asked about issues concerning their productivity in working from home. In this approach to the study of productivity, the terms *perceived, subjective or declarative* productivity or performance are used in the literature (Aboelmaged & Subbaugh, 2012; Toscano & Zappala, 2020; Wang et al., 2020). Evans et al. (2021) examined the relationship (for N=947) between personality and within-person changes in five job outcomes (e.g. self-reported performance, job satisfaction) and found out that, on average, self-reported performance decreased over the course of the study. Many researchers have sought to identify productivity factors, which may or may not be conducive to the perceived productivity of remote workers. Miele and Tirabeni (2020) even point out that the particularity of remote work requires the shaping of a private self. The employee should, according to the expectations of the company, be autonomous but achievable and strongly committed to the goals of the organization; productive and attentive to his/her health and well-being. Not only the characteristics of the employee, but also the characteristics of the job determine productivity in remote work. Wang et al. (2020) identified the following remote work challenges: work-home disruptions, ineffective communication, procrastination and loneliness, virtual work characteristics that influence the experience of these challenges, i.e. social support, work autonomy, monitoring and workload and self-discipline as a key factor of individual employee differences. Table 2 provides a review of

Table 2. Literature review on factors shaping perceived productivity

Authors	Year	Factors and their effects
T. Galanti, G. Guidetti, E. Mazzei, S. Zappalà, F. Toscano	2021	Work-family imbalance and social isolation adversely affect work performance, while self-leadership and autonomy in job duties increase work-from-home productivity.
F. Toscano, S. Zappalà	2020	Social isolation and stress may reduce the declarative productivity of remote workers.
B. Wang, Y. Liu, J. Qian, S. K. Parker	2020	Lack of peace and quiet when working from home, ineffective communication with co-workers, procrastination and loneliness can negatively impact remote work productivity.
P. Hardy, S.M. Leandro, J.F. Fontanari	2020	Restricted social interactions due to teleworking may negatively affect the productivity of introverts, while they may improve the productivity of extroverts.
A. Nakrošienė, I. Bučiūnienė, B. Goštautaitė	2019	The possibility of fast communication with co-workers, trust and support from the supervisor, as well as a properly prepared workplace are all factors that contribute to higher productivity in remote work. In addition, the possibility of taking care of family members while teleworking is favourable.
M. Charalampous, C. A. Grant, C. Tramontano, E. Michailidis	2019	Social and professional isolation may jeopardise a worker's professional development.
T.A. Bentley, S.T.T. Teo, L. McLeod, F. Tan, R. Bosua, M. Gloet	2016	Providing organisational support to the teleworker has a positive impact on their productivity.
R. Torten, C. Reaiche, E.L. Caraballo	2016	Experience on teleworking success has the potential to materially affect the success of the teleworking model.
T.A. O'Neill, L.A. Hambley, A. Bercovich	2014	Personality plays a role in remote work outcomes.
C.A. Grant, L.M. Wallace, P.C. Spurgeon	2013	Trust and governance are key to the effectiveness of remote workers.
M. G. Aboelmaged; S. M. El Subbaugh	2012	Job stability is a key factor in remote working productivity. In addition, job satisfaction, commitment, flexible working hours and support from supervisors have been identified as important determinants productivity.
S. Procter	2008	Work organization and human resources management policies reveal two groups of factors affecting labour productivity: organisational and motivational factors.
Y. Baruch, N. Nicholson	1997	Remote working can cause social and professional isolation that impedes job performance.

Source: Own elaboration.

the literature discussion on the issue of remote work productivity, and more specifically, the results of research by various authors who have undertaken to analyse the factors, attitudinal, and situational that may be important in shaping the productivity of a remote worker.

The authors of the cited studies most often point out the dangerous consequences of social isolation and ineffective communication with co-workers on the effectiveness of remote work (Charalampous et al., 2019; Toscano & Zappala, 2020; Baruch & Nicholson, 1997). The lack of efficient communication precludes work performance, hence many studies emphasise the need to provide teleworkers with organisational support precisely in this regard (Bentley et al., 2016; Nakrošienė et al., 2019). Some recent research has focused on analysing the impact of remote working environments on employees' career development. Remote working has the potential to stifle efforts to maintain engagement, and consequently, hinder the career development and progression of e-workers. This suggests that virtual mentoring is considered essential to ensure high performance among employees, who should continuously develop their skills while working virtually (Yarberry & Sims, 2021;Phillips, 2020). Research has emerged highlighting how to support remote e-workers. Park, Jeong and Chai (2021) proposed how human resource development (HRD) professionals can support remote e-workers' career development. The authors also point out the need for peace and quiet in the workplace (Wang et al., 2020).

Grant et al. (2013) and Nakrošienė et al. (2019) mention the role of the supervisor's trust and management style in shaping the productivity of remote workers. In the case of work done remotely, the control of the employee is difficult, hence the role of trust on the part of the supervisor and the need to focus on the results of work and not necessarily on the time of work increases. Torten, Reaiche, and Caraballo (2016) have proven that previous experience in teleworking is a prerequisite for success in teleworking. Some of the researchers also seek to identify whether gender or personality traits of telecommuters may determine the productivity of remote working (Cannito & Scavarda, 2020; O'Neill, Hambley & Bercovich, 2014; Hardy, Leandro & Fontanari, 2020; Chung et al., 2021). For example, Galanti et al. (2021) point out that when there is less control from the boss, remote work productivity gains are facilitated by remote workers' self-management competencies. In contrast, Wang et al. (2020) discuss the negative impact of employees' tendency to procrastinate on work productivity. In both studies cited here, the authors identified specific competencies or character traits that may foster or impede remote work. All of these factors are, in a way, a new group of factors that play an important role in shaping the productivity of remote work. When working on-site, employees do not have problems with social isolation, limited contact with other employees, or peace and quiet in the workplace. Some studies also identify other important determinants of high e-work productivity, such as job stability, the need for work-life balance, and job satisfaction (Galanti et al., 2021; Aboelmaged &

Subbaugh, 2012). However, the importance of these factors is similar in relation to shaping the productivity of stationary work. Osterman (1999) distinguished four organizational forms with different impact on productivity: self-directed work teams, job rotation, problem solving groups, and Total Quality Management. Procter (2008) indicated the factors that shape the productivity of remote work, which depend on work organization and HRM, by focusing on employee attitudes and strategies influencing productivity. He pointed out the need to understand the system of the management-employee relations, which might generate effects of the management actions.

All of these analyses may help to organise remote work in a way that is conducive to productivity or, in other words, to develop better remote work policies (Tanpipat, Lim & Deng, 2021).

Based partly on the literature discussion and own observations, 13 factors that may determine the productivity of remote work were adopted for investigation: the use of Information Communication Technology (ICT) tools, the frequency of remote working, the use of technical assistance during remote work, workplace adaptation, the quality of the Internet connection, work environment, the level of stress, the manager's control over the employees, communication with the manager and/or client, costs of remote working, savings of travel time to work, access to social insurance, as well as good career and promotion possibilities. Based on the literature analysis, the following hypothetical relationships (H) were set to verification with reference to the 13 factors mentioned above:

H1: A higher number of ICT tools improves remote work productivity; it is hypothesised that a higher number of ICT tools used by an employee indicates more advanced technical knowledge, which, in the case of remote work, translates into the ability to achieve higher productivity (and vice versa),

H2: The higher the frequency of remote working, the higher the productivity; it is hypothesised that more frequent remote working promotes increased productivity (and vice versa),

H3: Frequent use of technical support translates into reduced productivity of remote working; it is hypothesised that frequent use of technical assistance translates into lower productivity of remote work (and vice versa),

H4: Proper adaptation of the workplace contributes to increased productivity while performing work online; it is hypothesised that the right adaptation of the workplace promotes productivity growth during work (and vice versa),

H5: A stable Internet connection is clearly conducive to increasing the productivity of remote work (and vice versa),

H6: Peace and quiet favour productivity; it is hypothesised that peace and quiet are conducive to being productive (and vice versa),

H7: Increasing stress levels have a negative impact on the productivity of remote working; it is hypothesised that increasing levels of stress negatively affect the productivity of remote working (and vice versa),

H8: Limited managerial control may translate into less productive work done remotely; in this case, it is hypothesised that this factor may translate into lower productivity for employees working remotely,

H9: Limited communication with the manager and/or the client translates into reduced productivity when working remotely; it is hypothesised that limited communication with the manager and/or client may translate into reduced productivity of remote working,

H10: Rising costs of remote work borne by the employee will be accompanied by a fall in declarative productivity; it is hypothesised that the increasing costs of remote work, those of the employee, would be accompanied by a fall in declarative productivity (and vice versa),

H11: The time saved on the commute to an onsite job can increase the productivity of work done remotely; it is hypothesised that time saved on the commute to an onsite job can increase the productivity of work done remotely in two ways. This 'extra' time may be used either for work (overtime) or for leisure. In both cases, it will translate into an increase in declarative productivity,

H12: Access to social security and real protection of the remote worker is conducive to being productive; it is hypothesised that access to social security increases the psychological comfort of work, which clearly favours being productive (and vice versa),

H13: Career and promotion possibilities increase the productivity of e-work; in this case, it is hypothesised that the opportunity for career advancement favours remote working, and that as promotion opportunities increase, the productivity of part-time work will increase (and vice versa).

2. Research methodology

The research design serves to determine the purpose of the research, to define the methods and clarify the strategy of choice for conducting the study (Apanowicz, 2002). Regarding the potential impact of remote work on labour productivity in Poland, the Czech Republic and Hungary, this study seeks to identify factors determining labour productivity of individual workers who perform their jobs remotely and to measure the importance of factors determining labour productivity. It also identifies the most important factors which employers should take into consideration. The study involved the following procedure. First, potential productivity factors of remote working were established based on the literature and assumptions were made about their impact on productivity. On this basis, a survey questionnaire was developed, which

consisted of two parts. The first, introductory part contained questions qualifying the respondent to participate in the analysis and presenting their type and mode of work. The second part of the survey contained 20 diagnostic and prognostic questions, related to the remote work performed and its significance for the shaping of productivity. The nature of these questions and the expected answers present information through the prism of the views and evaluations of the surveyed individuals and they fall within:

1. cost driven factor of productivity (e.g. wages, expenses for technical adaptation of the workplace, securing working conditions and health and safety at work),
2. organisational aspects of remote work affecting productivity (e.g. continuous technical support, division of labour, workload, promotion possibilities, employee control),
3. quality scope of issues (e.g. freedom to organise working time and to choose the intensity of work, autonomy and independence, working environment).

The next stage of the study involved statistical analysis of the survey results. The analysis of the data obtained through the survey was based on a logistic regression for the dependent variable of labour productivity, whose vector was determined through the survey. The results of the relationship between the productivity factors and the dependent variable were subjected to k-means analysis for obtaining ensembles of characteristics of the survey respondents. Logistic regression was considered since the nature of the dependent variable, which is nominal, dichotomous in nature. In other words, the measured behaviour of the research participant's assessment of his or her productivity either increased or decreased with remote working. The result of the measurement is in this case zero-one. The results of the analysis became our main source for the proposed conclusions about the drivers of the productivity studied.

Remote workers who were eligible to provide the needed information as remote workesr now and in the past were selected to conduct the survey and set the scope of survey sample. As highlighted by J. Apanowicz (2002) several study approaches can be applied. The options include experimental survey, archival research, storyline or case study research. Each strategy has advantages and disadvantages; moreover, they can be used alternatively in research. Accordingly, the data were gathered through a survey questionnaire which best met the objectives of the study. The questionnaire consisted of questions about opinions and facts. It used close-ended and cafeteria questions addressed at respondents of varying age, sex, and education, and representing different business sectors. The questionnaires were administered by interviewees when posted online by research agencies (different in each country) at the same time. A cross-sectional study design was applied to collect data needed for this research. As a result, the data were collected at a given point in time (June 2021) by CAWI survey for the entire sample (450, but with a country quota of 150). The survey was carried out by three different research agencies, one in each country on its own group

of declared respondents. The target population consisted of all citizens living and working fully or partly remotely in the present or in the past, regardless of how long and how often, with a quota cross-section of age, gender and occupation. All questionnaires proved to be valid. Conducting the survey with the help of a research agency ensures the credibility of the respondents and has advantages over surveys conducted anonymously using an online method among previously unrecruited and unreliable respondents. This was to ensure that the results are more applicable to studies which aim to identify and measure the importance of factors determining labour productivity by individual remote workers. Thus, the results are more pertinent and they can be used to generalise for targeted populations.

2.1. Sampling procedure and analytical tools

Sampling is traditionally performed by two approaches. They are based on probabilistic or non-probabilistic methods and have some subordinate types of procedures, such as determining the sample according to a common format, stratified or systematic testing, and others (Apanowicz, 2002). Probabilistic methods assume explicit sampling, while non-probabilistic methods include purposive sample collection, snowballing, and qualified sampling (Bhattacherjee, 2012). In this study, probability sampling is valid and assumes that every representative of the population over the age of 18 has the same chance of being selected. It is unbiased and has a sufficient size for the results to be reliable (Bhattacherjee, 2012). The researchers of this study used a probability sampling approach and randomly selected 450 respondents. As a result, data was collected at a given point in time (June 2021) for the entire sample, but the country quota was 150. The sample was stratified according to the three countries selected for the study.

In order to determine the sample size, the analysis should verify the actual size of the phenomenon being analysed, rather than just follow statistical calculations. Major factors such as the confidence level and margin of error (confidence interval) should be identified. In this study, 95% confidence level and 5% margin of error are adopted. Based on the statistical calculation, it appears that for a population of 100.00+, the sample size should be at least 384 individuals (https://www.naukowiec.org/dobor.html. 10.09.2021). However, in order to improve the quality of the study, the sample size was increased to 450 individuals, so that the cut-off point decreased below 5%. The target size set at 450 was met even though respondents were eliminated after they said no to the question 'Have you ever worked remotely?' In such cases, the researchers replaced such respondents with new ones to maintain the sample size of 450. All questionnaires collected were valid.

Once the scope of the data has been defined, appropriate analytical methods were selected and implemented. Logistic regression and k-means are the methodological tools used in our study. The use of logistic regression is com-

mon in labour market and productivity analyses. In Slell's (2020) study, logistic regression and nonparametric tests were also used to reveal the relationship between occupations included in external labour markets and macro, meso, and micro variables, with managerial and theoretical implications. As the labour market is constantly changing, atypical work is becoming more relevant, especially in the current times of the coronavirus crisis restrictions. Davidescu, et al. (2020) found logistic regression to be suitable for highlighting the importance of employee development and employee flexibility as important aspects of sustainable human resource management in increasing the overall level of employee work. The paper by Sablok, et al. (2017) investigates the extent (using frequencies) and determinants (using logistic regression analysis) of training and development expenditure, management development strategies, talent management and succession planning policies. Yi and Ifft, (2019) used cluster analysis to divide dairy farms into three productivity categories (high/medium/low) based on return on farm equity, asset turnover ratios and net dairy income per hundred kilograms of milk. With respect to remote work, our proposed set of analytical techniques is in line with Davidescu at el. (2021), who applied logistic regression to test whether and to what extent teleworking, as an important source of workplace flexibility, can affect the way Romanian workers self-evaluate their level of satisfaction, and then extracted subgroups to find the main differences between them. The study reveals that flexibility is an important factor contributing to satisfaction and varies by region, sector and company type as well. Investigating the data according to the above literature, our study shapes the way to achieve the results presented below.

3. Research results

The designed research questionnaire on labour productivity under the conditions of modern forms of employment essentially consisted of two parts. The first—introductory part—included questions qualifying the respondent to participate in the analysis, a personal data sheet, as well as questions about the general forms and conditions of work. This part was aimed at obtaining the necessary information about the respondents for the analysis. The second part contained 20 diagnostic and prognostic questions related to remote work and its significance in shaping productivity.

The survey involved 450 respondents from Poland, the Czech Republic and Hungary. Men accounted for 55.8% and women for 44.2% of the respondents. The most numerous group were respondents between 30 and 50 years old. 64.2% of the respondents had higher education, 33.1% had secondary education, and less than 2.7% had vocational and primary education. The vast majority of the respondents (78%) worked in the service sector. 70.9% of the respondents worked in a hybrid way, combining remote work with work at the

employer's office, while the rest worked exclusively remotely. 44.2% of the respondents worked remotely every day, 32% several times a week, and the rest occasionally: several times a month or even a year. The most frequently declared form of work was an employment contract (81.3%), and nearly 11.6% were self-employed.

Furthermore, the dominant group are workers who declare an increase in productivity when working remotely (46.7%), while remote work with low productivity accounted for only 23.6% of the responses. The remaining respondents were unable to clearly indicate whether the current conditions of their remote work are conducive to an increase or decrease in their productivity.

Table 3 shows the distribution of responses by age, gender, level of education, divided into an increase in productivity, and a decrease in productivity. Most respondents declared an increase in productivity when working remotely and these respondents can be divided by group characteristics. People between 30 and 50 years old dominated among the respondents reporting a growth in productivity. In addition, both men and women (21.6% and 25.1% of the total respondents) predominated among those declaring an increase in productivity. Taking into account the level of education of the respondents, people with higher education (29.6% of the total number of respondents) and with secondary education (16.2% of the total number of respondents) said that their productivity increased when working remotely clearly prevailed. On the other hand, the feeling of reduced work productivity affected 23.6% of the total respondents, mainly those with higher education (14.9% of the total).

Table 3. Distribution of respondents according to declared increase or decrease in productivity of their remote work

'Current remote working conditions'		Decrease in productivity	Difficult to say	Increase in productivity	Total
Age	< 30 years	5.3%	3.3%	7.3%	16.0%
	30-50 years	10.9%	15.6%	21.7%	48.2%
	> 50 years	7.3%	10.9%	17.6%	35.8%
Sex	female	9.3%	13.3%	21.6%	44.2%
	male	14.2%	16.4%	25.1%	55.8%
Education	primary	0.4%	0.0%	0.4%	0.9%
	vocational	0.7%	0.7%	0.4%	1.8%
	secondary	7.6%	9.3%	16.2%	33.1%
	higher	14.9%	19.8%	29.6%	64.2%
Total:		23.6%	29.8%	46.7%	100%

Source: Own calculation.

In this study, to determine whether there is a relationship between 13 factors representing work organisation and work motivation groups and changes of productivity, the researchers implemented logistic regression models using the progressive selection method. Table 4 includes univariate logistic regression models and tests. To obtain more reliable data, the researchers employed logistic regression to test the 13 formulated statistical models (H) (1st column of Table 4).

In Table 4 we can see that 11 out of the 13 relationships are confirmed, while 2 out of the 13 are insignificant (rows 1 and 10). Another 11 out of the 13 confirmed relationships show varied levels of correlation with labour productivity growth. Given that there is no statistical significance for the 1st and 10th factor, the interpretation of the statistical data will only cover the remaining 11 productivity factors.

H2: The result for increased work frequency indicates that we are 3.4 (OR = 3.422) more likely to achieve higher productivity compared to a situation with lower work frequency. The β coefficient of regression was found to be statistically significant (Z2 = 18.384, p = 0.000) and the expected probability of increased productivity is 86%.

H3: The data for low frequency of technical support (TA) use indicate that we are 2.4 (OR = 2.354) more likely to have higher productivity compared to a situation where the frequency of TA use is higher. The β coefficient of regression was found to be statistically significant (Z2 = 5.126, p = 0.024) and the expected probability of increased productivity is over 92%

H4: The regression results for the right adaptation of the remote workspace indicate that we are 4.7 (OR = 4.693) more likely to achieve higher productivity compared to the situation where the workspace would be poorly adapted to work. The β coefficient of regression was found to be statistically significant (Z2 = 21.065, p = 0.000) and the expected probability of increased productivity is 91%.

H5: The data for maintaining the quality of the Internet connection at the right level indicates that we are 2.7 (OR = 2.679) more likely to achieve higher productivity compared to when the quality of the connection is inadequate. The β coefficient of regression was found to be statistically significant (Z2 = 8.817, p = 0.003) and the expected probability of increased productivity is 90%.

H6: Data on a guaranteed quiet and calm environment for doing remote work indicate that we are 4.8 (OR = 4.799) more likely to achieve higher productivity compared to a situation where this environment would not provide a guarantee to work in peace and quiet. The β coefficient of regression was found to be statistically significant (Z2 = 20.692, p = 0.000) and the expected probability of increased productivity is 92%.

H7: The data on increased stress levels while working remotely indicate that we have a 0.05 (OR = 0.046) greater chance of decreased productivity

Table 4. Univariate logistic regression models and tests

Dependent variable = productivity of remote work							Pooled test of model coefficients		
H	**Independent variables:**	**B**	**Stand. error**	**Wald**	**Sig.**	**OR**	**Cox's, Snell's R2**	**Nagel. R2**	**p**
1.	Number of ICT tools	–	–	–	0.445	–	–	–	–
2.	Frequency of remote working	1.230	0.287	18.384	0.00	3.422	0.058	0.091	0.859
3.	Frequency of use of technical support	–0.856	0.378	5.126	0.024	2.354	0.017	0.034	0.920
4.	Adaptation of the workplace	1.546	0.337	21.065	0.000	4.693	0.073	0.125	0.909
5.	Stable Internet connection	0.985	0.332	8.817	0.003	2.679	0.029	0.051	0.896
6.	Peaceful and quiet work environment	1.568	0.345	30.692	0.000	4.799	0.072	0.126	0.918
7.	Stress levels	–3.080	0.353	75.982	0.000	0.046	0.289	0.432	0.065
8.	Manager's control over the employees	–1.096	0.272	16.275	0.000	0.334	0.062	0.082	0.440
9.	Communication with the manager and/or client	–1.325	0.258	26.340	0.000	0.266	0.087	0.199	0.263
10.	Costs of remote work	–	–	–	0.639	–	–	–	–
11.	Commute time savings	1.219	0.219	17.522	0.000	3.385	0.073	0.097	0.568
12.	Access to social security	0.625	0.240	6.788	0.009	1.868	0.015	0.024	0.843
13.	Career & promotion possibilities	1.782	0.297	35.931	0.000	5.941	0.147	0.199	0.740

Source: Own calculation, based on SPSS, IBM Statistics.

compared to absence of stress. The β coefficient of regression was found to be statistically significant (Z2 = 75982, p = 0.000), and the expected probability of decreased productivity is less than 7%.

H8: The results for limited (remote) managerial control over employees indicate that we are 0.3 (OR = 0.334) more likely to achieve lower productivity compared to a situation with traditional control. The β coefficient of regression was found to be statistically significant (Z2 = 16.275, p = 0.000) and the expected probability of decreased productivity is 44%.

H9: The data on limited (remote) communication with a manager and/or a client in a remote working setting indicate that we are 0.3 (OR = 0.266) more likely to achieve lower productivity compared to a situation where this communication would take place in a traditional manner. The β coefficient of regression was found to be statistically significant (Z2 = 26.340, p = 0.000) and the expected probability of decreased productivity is 26%.

H11: The data for increased saving of time spent commuting to and from work indicates that we are 3.4 (OR = 3.385) more likely to achieve higher productivity compared to when the respondent would spend more time commuting to and from work. The β coefficient of regression was found to be statistically significant (Z2 = 17.522, p = 0.000) and the expected probability of increased productivity is 57%.

H12: The results for increased/guaranteed access to social insurance indicate that we are 1.7 (OR = 1.868) more likely to achieve higher productivity compared to a situation where access to insurance would be limited. The β coefficient of regression was found to be statistically significant (Z2 = 6.788, p = 0.009), and the expected probability of increased productivity is 84%.

H13: The data on career advancement defined by the possibility of remote work and career advancement indicate that we are 5.9 (OR = 5.941) more likely to achieve higher productivity compared to a situation where taking on additional work and/or achieving advancement would be limited. The β coefficient of regression was found to be statistically significant (Z2 = 35.931, p = 0.000) and the expected probability of increased productivity is 74%.

Taking all the results into consideration, 11 out of the 13 hypotheses have been confirmed, while two of them cannot be confirmed or rejected (Table 5).

Taking into account the results of the analysis, the individual productivity factors can be ordered according to their odds ratio for achieving higher productivity (OR index). Based on the results obtained, it can be assumed that the factors that increase the chances of enhancing the productivity of remote work are mainly the possibility of taking up employment (including additional work) and career development. It is as if remote working offers greater potential for accessibility to finding attractive employment in the labour market, and is recognised as an element which improves an employee's chances in the

Table 5. Summary of logistic regression models

	Research output	Relationship verification
H1:	Result statistically not significant	Not confirmed and not rejected
H2:	There is a relationship between the frequency of remote working and productivity. Increased frequency of remote working is accompanied by increased productivity (and vice versa).	Confirmed
H3:	Frequent use of technical support and remote work productivity are correlated. Frequent use of technical support may reduce the productivity of remote working.	Confirmed
H4:	Proper adaptation of the workplace can translate into increased productivity of remote working.	Confirmed
H5:	Stable Internet connection increases the productivity of remote work.	Confirmed
H6:	The peace and quiet of the remote working environment is conducive to increased productivity.	Confirmed
H7:	Increased stress translates into reduced effectiveness of remote working.	Confirmed
H8:	Manager's lack of full control over employees can be conducive to decreased productivity.	Confirmed
H9:	Limited communication with the manager and/or the customer translates into a loss of productivity.	Confirmed
H10:	Result statistically not significant.	Not confirmed and not rejected
H11:	Saving time on commuting is linked to increasing the productivity of remote working.	Confirmed
H12:	Social security guarantee translates into increased online productivity.	Confirmed
H13:	Career and promotion opportunities increase the productivity of remote work.	Confirmed

Source: Own elaboration.

labour market. Other important factors also include the guarantee of a quiet and peaceful working environment and the proper adaptation of the workplace to remote working. Qualitative factors play a far greater role than organisational factors, and cost factors influence is ambiguous to establish in the study. However, among the organisational factors increased remote work productivity was also significantly associated with factors such as increased frequency of remote working, or increased time savings for commuting to and from work. The other factors analysed have a lower odds ratio for improved remote work-

ing productivity, but nevertheless have a positive impact on increased remote working productivity (Table 4).

Following the research model with the results of the logistic regression study, a pooled k-means analysis was conducted to determine a summary outline of the attitudes of a remote worker. The 11 variables whose effects on labour productivity were found to be significant in the logistic regression test were used for k-means analysis (Table 4). Silhouette index values indicate the significance of the combination involving five variables for two and three clusters groups (0.22 and 0.23 respectively). In the case of the two clusters (Figure 1), the first group shows people who achieve lower productivity in remote work conditions while remaining under managerial control, when communication at their work is not limited, and remote work does not increase their stress level. The second group includes people who declare high productivity in the conditions of remote work, work in conditions of low managerial control and strongly limited communication, but their stress level is higher.

In the case of the three clusters, the first group is composed of people who achieve high productivity in remote working conditions while remaining under the manager's control. Communication with the company is not limited, and working remotely does not increase their stress level, but gives them a chance for promotion. The second focus group is people who report very high productivity and work in conditions of limited managerial control and communication with the company, and their stress level is high, however this work offers opportunities for promotion. The profession of a software developer could

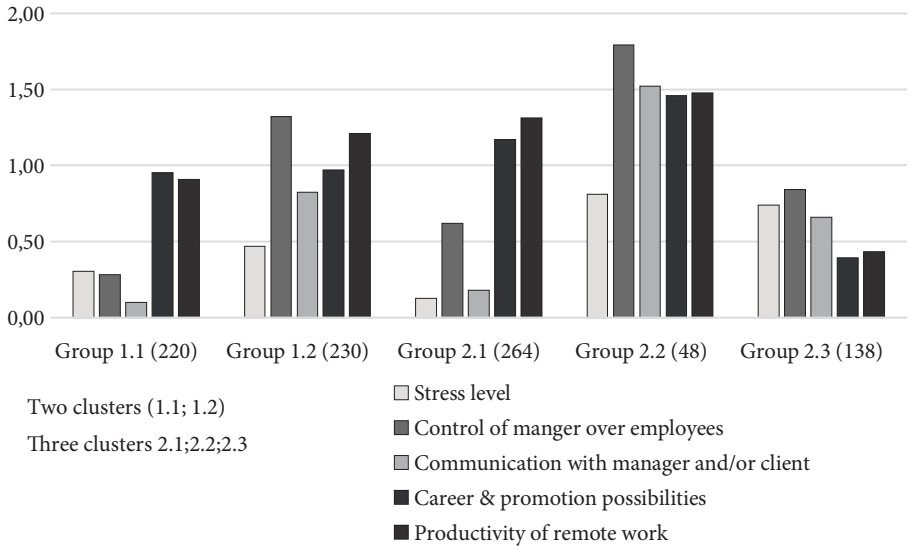

Figure 1. Cluster analysis for two and three clusters group, quantity of group, values

Source: Own calculation, based on SPSS, IBM Statistics.

have such potential. The third group are those who declare low productivity in remote work and are under the control of a manager. Communication in their work is smooth, but they experience higher stress and the chances of advancement in their career remain very poor. This attitude can be identified with low-paying occupations and routine work such as accounting. As can be seen from the k-means analysis, the productivity level of employees is mainly associated by stress and managerial control. The lover they are the lover productivity reveals, and vice versa. Moreover, a noticeable feature of employee attitudes is also potential promotion opportunities, which is associated with higher productivity. This means that the tendency to work more productively does not necessarily diminish with the implementation of remote work. Our study shows that another distinguishing factor is the type of work task, as favourable results in terms of productivity include those activities that are under regular control and those where independence and autonomy prevail.

Our analysis is in line with the recent empirical literature on labour productivity, i.e. virtual work characteristics are related to productivity, but they also highlight the heterogeneity of workers in terms of labour productivity. A worker with a high routine workload but subjected to control treats it as support, on the other hand, a worker with a higher level of self-discipline works more efficiently under less control (Wang et al., 2020). In addition, the authors emphasise that other factors, especially stress, work intensity, the Internet connection quality, and lack of peace and quiet are important determinants of labour productivity (Toscano & Zappalà, 2020; Wang, Liu & Qian, 2020; Procter, 2008; Baruch & Nicholson, 1997). It can be also related to organisational culture. As studied by Krajcsák, Z., i in. (2022), the results highlighted that due to the home office the dominant organisational culture determines the effects of remote working. In organisations with a dominant market culture, the effects changed the least. In organisations with a dominant clan culture conscientiousness, work decreased. The dominant hierarchical culture reacted most negatively. Our analysis are complementary to thesis on productivity determinants which are stated by Pokojski, Z. (2022) based on 248 employers survey. Results show that employers often notice the positive nature the similar group of factors as worker do. Among the enterprises that were surveyed, the most frequently indicated were: additional office equipment provided to an employee, remote work training, and the installation of additional computer programs. Financial support was declared by olny about 11% of the enterprises and it usually took the form of a remote work allowance or funds to cover the costs of purchasing equipment or paying for the Internet.

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Conclusions

Remote work has become a necessity among many professions, regardless of age or education level. For various reasons, work in this form facilitates the implementation of tasks that cannot be performed on-site, that is at the headquarters of the company. Due to this necessity, business owners and customers commission tasks from contractors without securing the conditions to perform the task. The relatively large physical distance means that the result of the performed work may not meet the expected requirements. The productivity of remote work has become a subject of consideration in the literature due to its key role in business. Generally, part of the discussion cited in this paper is studies on the factors that regulate the levels and trends of productivity. They were the core basis of devised questionnaire. Our statistical research on data received revealed that the group of 11 defined factors is positively (8) and negatively (3) related to remote work productivity. Some factors were found to be insignificantly related to productivity in our study. We cannot confirm the relationship between 'a high number of ICT communication tools', 'costs of remote work', and productivity, although there is a basis in the literature to claim that their relationship occurs.

The answer to formulated objectives in paper introduction as to identify factors determining labour productivity of individual workers who perform their job remotely and to measure what factors have relatively the greatest impact on productivity, presents the scope of factors with OR logistic regression measure defining the factor importance. According to our research, in order to achieve high productivity in remote work, it is worth taking into account factors that are four times more likely to increase productivity than to decrease it. These include adapting the workplace (OR:4.7) to the skills and qualities of workers which is relatively easier for highly educated workforce. Work organization features such as a quiet and peaceful environment are also very important (OR:4.8), especially that remote work is performed not only at home but also on business trips. Work satisfaction factors represented by good career and promotion opportunities seem to have the greatest impact on productivity (OR:5.9). Although limited control and communication with the manager as well as the stress for an employee who has limited opportunities to verify his/her work and can only trust himself/herself were found to be important. Their impact on productivity was rated at less than one chance of productivity loss.

The collusion from study focus on qualitative factors of higher labour productivity which are skills and qualities, promotion and future career. The organization issues however could be expected as very important but revealed less important. So adaptation of the workplace, a stable Internet connection impact productivity but less than for example a worker promotion. Costs of remote work, taken into account were not identified as statistically significant.

It should be recognised that the level of productivity achieved in these unique working conditions is primary an individual matter for the employee. Secondly, in the paper underlined the importance of investing in the quality of work. In the paper, the authors have underlined the importance of undertaking financial and organisational measures to encourage workers and managers to formulate new systems of work communication and work control. As it reveals from K-12 study that the higher control and stress can be expected directly related to higher productivity of work.

Remote working in the digital economy will trigger certain economic policy measures. Taking into account that the countries under study are at a similar level of economic development and belong to the European Union, moreover, these countries cooperate within the Visegrad triangle and their system of functioning is highly based on the market mechanism, these actions should be taken both by individual manufacturing or service companies and on the scale of the whole economy. The most important microeconomic tasks include: continuous and flexible adaptation to changing market conditions. Moreover, the adaptation of the commodity structure of products or services to the market demand will be an important factor increasing the effects of remote work and thus leading to the improvement of labour productivity dynamics. Timely delivery of the economic policy instruments on offer will also be an important factor, so that digitisation takes place at a pace balanced with the learning process. An important direction of influence on a micro-scale should be technical and organisational support for people working remotely and a system of their training.

Study has some limitations. First, relationship issues may result from any unobservable, unidentified variables in the matching model, and may also result from the cross-country nature of the data. Second, the one-time sampling procedure forced us to use data as our main dataset with limited availability of data-independent variables. The limited number of responders from each country made us to strongly limit on separate conclusion to each one.

The authors recommend further research to carry out an in-depth study on labour productivity taking into account microdata based on employee-employer relations. In this situation, research should yield a better understanding of the risks and threats of the development of the remote working model.

Future research using statistical data should include the issues of adaptation of companies to new conditions in the era of digitisation and state policy support for programs of on-the-job training and support in implementation of innovative managerial solutions (Procter, 2008). The increased interest in the

productivity of remote workers and its possible explanations (OECD, 2021) indicate that better management of remote or hybrid work requires further studies on determinants of work motivation in a digitalised economy. Nowadays companies face high pressure of work-from-home rules and try to regulate its chronology and time scope with inconsistent results in mutual satisfaction. Recent studies on micro data highlight the importance of new law rules and norms referring to remote work (Bernstein et al., 2020). Thus, it is important to examine the role of company management and intangible labour productivity factors based on micro data and a broader range of factors.

The study reveals a set of factors influencing the level of productivity of remote work, which concludes about some challenges, risks and opportunities that should be considered by those employers and employees who wish to stay with remote working in a full or hybrid form (Eurofound, 2021). The authors consider the obtained results valuable for researchers engaged in studies on the organization and management of labour resources for better generation of added value gained from remote work.

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Index of the cycle of money—the case of Poland

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Abstract: This paper aims at assessesing how a well-established theory of the cycle of money works in a real scenario like the economic system of Poland. The prior works have revealed the case of Latvia, Serbia, Bulgaria, Greece, Thailand and Ukraine according to the concept of the theory of the cycle of money. The outcomes show that Poland is over the average global value. The results confirm that Poland is a well-structured economy able to overcome an economic crisis. The current work is significant, as it verifies the strength of Poland's economy to a potential crisis. The period under analysis encompasses the years 2012–2017, i.e. a period in which the EU and other European countries counteracted an economic crisis. Therefore, the purpose of the paper is to show the condition of Poland's economy, based on that theory. The paper aims to calculate the index of the cycle of money. The hypothesis of the paper is the econometric testability of the index of the cycle of money. The general index of the cycle of money of Poland's rate is 0.62 for the above-mentioned period of crisis in the Eurozone and more generally in Europe. Poland's index is much higher than this minimum rate. This is the only published work for Poland following this theory; therefore, it provides new findings of the economy of Poland, based on on the theory of the cycle of money.

Keywords: the cycle of money, index of the cycle of money.

Introduction

Bigger and international companies in most cases save their money in external banks and economic heavens. Therefore, according to this theory, the tax authorities should put an additional tax on this kind of companies to reduce the losses to the economy. Moreover, smaller companies and freelancers should be taxed with lower tax rates. It would be plausible to increase the dynamics of the economy. Factories, know-how services of big companies, the health care system and the educational system are special cases for the economy, as they belong to those cases where taxes improve the quality of the economy (Adhikari, Derashid, & Zhang, 2006; AICPA, 2017; Cai, 2017; Maxwell, 2020; Prestianawati, Mulyaningsih, Manzilati, & Ashar, 2020; Schram, 2018). Factories and large know-how companies increase the cycle of money, in the way that they do not substitute the activities of small-medium companies and

freelancers. The educational and health care systems improve the quality of the economy, making the whole economy better. Therefore, this paper seeks to make clear how the concept of the cycle of money works in an actual case scenario, such as the economic system of Poland (Ainsworth and Shact, 2014; Boland, 2014; Nations, 2014; Waworuntu and Hadisaputra, 2016; IMF, WB and WTO, 2017; Merle, Al-Gamrh and Ahsan, 2019; Irawan, Kinanti and Suhendra, 2020; Caldara et al., 2020; Choi, Furusawa and Ishikawa, 2020; Goswami and Purkayastha, 2020). The index of the cycle of money suggests how an economic system ought to counteract a monetary crisis and examines how well-structured a country's economy is. The estimates of the index of the cycle of money for Poland are used for a comparison with the global average index of the cycle of money (Challoumis, 2018, 2020b). The results reveal that Poland is close to the average global value, and therefore could face an economic crisis, as it is a well-structured economy (Gihman et al., 1972; Kushner, 1974; Wilson, 1986; Wijnbergen, 1987; United Nations, 2012).

The concept of the cycle of money reveals that taxes return to the economy in the case of the education and the health care system (these are exclusions from the mainstream where taxes support the economy). However, the tax authorities should maintain taxes at the lowest level. For small and medium companies, the government should protect them with very low taxes, simultaneously putting greater taxes on larger companies. Still, there is a type of big and international companies that should have low tax rates, as these companies do not substitute the activities of smaller companies. These types of big companies are factories and technological know-how companies. Then, the principal idea is to have a financial system, with the best allocation of production (Helpman, et al., 1989). Larger companies should not provide similar products and services, like those of smaller companies, as they can make investments in economic fields that smaller companies cannot support. In that way, an economic system achieves its best level. Additionally, the idea of the cycle of money shows that with the appropriate allocation of production units and taxes, money is cycled inside the economy achieving the maximum dynamics of the economy. This paper is about Poland's index of the cycle of money. The research is formed on the actual case scenario of the country's economic system. Therefore, the principal hypothesis of this paper aims to estimate the index of the cycle of money of Poland and to answer the question if it is near the worldwide general index of the cycle of money, according to the simple index or the general index of the cycle of money. The cycle of money of Poland should be above or close to the worldwide general index of the cycle of money to be able to counteract potential depression. The applied approach is based totally on mathematical estimations from the relevant theory.

The results clarified that Poland's economic system is properly established, as it follows the general international index of the cycle of money (the value of 0.5), which shows the average global case. The countries near and above 0.5

have appropriate distribution of money in their financial system. Consequently, Poland's economic system is considered as well established, based on the results of this paper. The question about the way in which the index of the cycle of money works in the case of Poland is answered on the basis of the structure of its economy and the way in which money is distributed in its economy. However, Poland needs some improvements to have an even better index of the cycle of money (Challoumis, 2020). Thus, Poland should decrease taxes for small and medium enterprises in order to achieve better reuse of money in the country's economic system and to increase taxes on big and international companies which proceed to controlled transactions (OECD, 2017a).

1. Literature review

The theory of the cycle of money is a theory that can reveal the economic dynamics of an economic system, and its potential to counteract a crisis. The reason for this is that the theory of the cycle of money depicts an economic system from a holistic view of the economy. This theory achieves that because it uses the GDP from the perspective of money and how it circulates in the economy. A metaphor for this theory could be that money is like "blood" in an "organism", and the economic units are "parts of the body". Thus, just as medical examination of "blood", money reveals possible problems of the organism. From a different point of view, the same happens during medical examination in some "parts of the body" – economic units, which check if there is some problem, so that a disfunction of the "organism" could be revealed. The theory of the cycle of money shows a complete image of the performance and the condition of an economy, determining if it can react to a potential economic crisis (the result of the index of the cycle of money in the case of Greece explained why the economy could counteract ten years of crisis when other indicators could not identify it clearly). The way in which money circulates and is distributed in an economy indicates how well-structured the economy is. If a body loses a lot of "blood" (ouflow of money from the economy), "parts of the body" will be weaker, and as a result, the "organism" (the economy), will become weaker. The opposite happens if money flows into the economy. If the "blood" (money) goes to one part of the "organism", this part will be much better; yet, from a holistic point of view, the "organism" will be weaker. This is the reason why the theory of the cycle of money is a theory which managed to "predict" that an international minimum rate of taxes should be implied for companies which proceed to international controlled transactions – F.L.P. (Fixed Length Principle) according to the theory of cycle of money (G7 decision for 15% global minimum tax rate) (Challoumis, 2019a).

Current results are based on the theoretical approach of the theory of the cycle of money, where the theory indicates that in the economy taxes return to

the society, basically in the case of the education and health systems. Besides, the authorities should keep taxes as low as possible for the medium or small economic units (meaning any kind of economic unit e.g. freelancers) and companies (Feinschreiber, 2004). In addition, the cases of Latvia, Serbia, Bulgaria, Greece, Thailand and Ukraine revealed that these countries are above the limit of 0.2 and close to the average rate of 0.5, making it possible to conclude that they can counteract a potential crisis (Challoumis, 2020a, 2021f, 2021e, 2021b, 2021d, 2021a, 2021c).

On the one hand, the fixed-length principle can enforce the cycle of money. On the other hand, the arm's length principle is the principle in which the authorities apply taxes to international companies and to groups of companies. The arm's length principle is a method that the tax authorities use to estimate tax obligations of the companies which participate in international transactions. The authorities applying the arm's length principle are tough to identify controlled transactions, as international companies offer similar data to those of uncontrolled transactions and they hide them with the purpose to avoid paying taxes. Thus, the authorities should apply the fixed-length principle. The fixed-length principle indicates that the companies making controlled transactions, manage transactions and achieve to avoid tax paying. Then, according to the fixed-length principle, international companies should pay plus a fixed amount of tax. Therefore, the cycle of money is boosted for the reason that larger companies generally receive money from society and the economy and save them in international banks. Therefore, that money is lost from society, diminishing consumption. According to the fixed-length principle, the local companies which save their money in local banks should have lower tax rates (Lerner, 1936; Mirman, 1971; Meyer and Rosenbaum, 2000; King, 2009; Ross, 2010; (ATO) et al., 2012; Ossa, 2014; OECD, 2015, 2017; McKay, Nakamura and Steinsson, 2016; Lindé and Pescatori, 2019).

Concluding, the fixed-length principle serves the theory of the cycle of money, where small and medium companies must pay lower taxes than larger companies which substitute their commercial activities. On the other hand, the arm's length principle estimates taxes standing on the methodologies provided by the companies that make international transactions. Hence, the large companies cover the activities of the smaller companies. Finally, small and medium companies robust the distribution of money to the country's economy, as usually they do not save their money outside the country's economic system, and reuse the money inside the economy. Therefore, the money distributed inside the economy a number of times increases the cycle of money (Challoumis, 2018, 2019b, 2020b, 2021b, 2021a).

The reason why money increases the cycle of money is obvious according to eq. (4) of the general index of the cycle of money. An implication of appropriate tax policy hinged on the theory of the cycle of money is expressed in two steps. The first step is about levying higher taxes on bigger companies that sub-

stitute the activities of smaller companies. Along these lines, bigger companies should be led to the sector of manufacturing and high know-how technological units. Hence, the country's economy could achieve a better structure, as smaller companies will be able to reuse and distribute money widely, and through the applied tax policy, bigger companies will invest in the manufacturing sector. Hence, the application of the cycle of money permits the improvement of the economy's structure, which is reflected in the distribution and reuse of money in the economy. The bigger companies, in particular, use the arm's length principle to achieve better allocation of profits and losses, through international banks and tax heavens, making the local banking systems weaker.

2. Methodology

This work utilises the mathematical background of the theory of the cycle of money. Based on the work "Mathematical background of the theory of cycle of money" the following mathematical equations have been defined:

$$c_y = c_m - c_\alpha \tag{1}$$

$$c_y = \frac{dx_m}{dm} - \frac{dx_m}{da} \tag{2}$$

$$i_{cy} = Y \cdot b_d \tag{3}$$

$$g_{cy\ Country} = \frac{c_{y\ coyntry's}}{c_{y\ Average} + c_{y\ coyntry's}} \text{ or } \frac{i_{cy\ coyntry's}}{i_{cy\ Average} + i_{cy\ coyntry's}} \tag{4}$$

$$g_{cy\ Average} = \frac{c_{y\ Average}}{c_{y\ Average} + c_{y\ Average}} \text{ or } \frac{i_{cy\ Average}}{i_{cy\ Average} + i_{cy\ Average}} = 0.5 \tag{5}$$

The c_m is the velocity of financial liquidity, c_α is the velocity of escaped savings and c_y is the cycle of money. The i_{cy} is the index of the cycle of money, Y is the national income or GDP, and b_d is the bank deposits of the country. In addition, $g_{cy\ Country}$ symbolizes the general index of c_y of the country, $i_{cy\ coyntry's}$ or $c_{y\ coyntry's}$ is the index of c_y of the country, and $i_{cy\ Average}$ or $c_{y\ Average}$ is the global index of i_{cy}. Concluding, $g_{cy\ Average}$ is the general global index of c_y, and is obtained as a global constant (Challoumis, 2019a, 2021d, 2021a, 2021c). The proper aim is to establish the connection between the index of global average c_y, the bank deposits and the GDP per capita, with an econometric approach. Then, the initial hypothesis is confirmed, namely that the cycle of money of the real case scenario is above the global average index of the cycle of money. The eq. (4) and (5) mean that an economy near to the value of 0.5 can face an economic

crisis immediately. Results close to this value represent an appropriate index of the cycle of money, revealing an adequate economic structure of the society and appropriate distribution of money between the citizens – consumers. Equation (1) is the term of the cycle of money used to define the $c_{y\ coyntry's}$ and $c_{y\ Average}$ of eq. (2).

The cycle of money to a quantity value is expressed by GDP, which is basically an expression of $\frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S+I+X})}$, according to $\frac{dx_m}{dm}$ and $-\frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S'+I'+M})}$ based on $\frac{dx_m}{da}$. Then, $c_y = d\left(GDP\right) = \frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S+I+X})} d(\mathrm{S+I+X}) - \frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S'+I'+M})}\ d(\mathrm{S'+I'+M})$, formed on $c_y = \frac{dx_m}{dm} - \frac{dx_m}{da}$, of eq, (2), where S is savings, I is investments and X is exports. Then, S' is the savings which are oriented to banks outside the country's economy, I' is the investments which are oriented to banks outside the country's economy, and M are the imports. Therefore, the cycle of money expresses the GDP as the following: $Y = S_T + I_T + (X - M)$, or $Y = (S - S') + (I - I') + (X - M)$ or $Y = \Delta S + \Delta I + (X - M)$. According to the theoretical background, for the lost money from the economies, the problem of controlled transactions could be administrated if an organisation could identify money transitions between the economies, comparing the global economies by ΔS, ΔI, and $(X - M)$.

$$\text{Thus, } c_{ytotal} = \sum_{i=1}^{n}\sum_{t=1}^{m} c_{yi,t} = \sum_{i=1}^{n}\sum_{t=1}^{m}\left[\frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S+I+X})} d(\mathrm{S+I+X}) + - \frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S'+I'+M})}\ d(\mathrm{S'+I'+M})\right]_{i,t}.$$

Because data from an organisation for these activities do not exist, the application of the index of the cycle of money is necessary. The cycle of money is an expression of the minus between the differential equations of the volume of money that is used in an economy and the volume of money that is lost from the economy. This is the reason why the theory of the cycle of money supports higher taxes for companies that make controlled transactions and, in general, bigger companies for the reason that smaller companies use an amount of money multiple times. There is an exemption for high technology companies and factories whose activities cannot be substituted by smaller companies (Mackean, Fisher, Friel, & Baum, 2020; Maxwell, 2020; Schram, 2018). Thus, if bigger companies substitute smaller companies, they should be taxed higher. As a result, bigger companies should be directed by the authorities to activities that cannot be offered by smaller companies, like factories and high technological units with beneficial, low tax rates. Thus, money is reused multiple times in the economy (Constantinos Challoumis, 2021g). Concluding:

$$c_y = d(GDP) = \frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S}+\mathrm{I}+\mathrm{X})} d(\mathrm{S}+\mathrm{I}+\mathrm{X}) - \frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S}'+\mathrm{I}'+\mathrm{M})}\ d(\mathrm{S}'+\mathrm{I}'+\mathrm{M}) \quad (6)$$

or

$$c_{ytotal} = \sum_{i=1}^{n}\sum_{t=1}^{m} c_{yi,t} \quad (7)$$

$$c_{ytotal} = \sum_{i=1}^{n}\sum_{t=1}^{m}\left[\frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S}+\mathrm{I}+\mathrm{X})} d(\mathrm{S}+\mathrm{I}+\mathrm{X}) - \frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S}'+\mathrm{I}'+\mathrm{M})}\ d(\mathrm{S}'+\mathrm{I}'+\mathrm{M}) \right]_{i,\,t} \quad (8)$$

Equations (5)–(8) are the proof of eq. (1)–(2). Moreover, eq. (3)–(5) for the indexes of the cycle of money express that the money of local banks comes from the whole economy, which in more than 90% of cases come from small and medium enterprises as well as freelancers. For this reason, the substitution of smaller companies transfers huge earnings of money out of the economy to tax heavens and international banks, outside the country. Hence, bank deposits indicate the amounts of money distributed and reused in an economy. In addition, the GDP is the derivative of the characteristics of the economy, giving its structure. The relation between the GDP and bank deposits is an expression of the index of the cycle of money.

3. Results—the case of Poland

According to the prior methodology, the following results have been obtained. This table includes the parameters of bank deposits, GDPs and the indexes of the cycle of money. This section reveals the dependence of Poland's index of the cycle of money using bank deposits and the GDP per capita (based on Poland's economy). The bank deposits of the global average and the global GDP per capita are used for the comparison of Poland's economy, its GDP per capita and the country's bank deposits.

The same conclusions come from an econometric point of view, with the dependent variable to be the index of the cycle of money:

The hypothesis is about the index of the cycle of money as a dependent variable with the factors presented in the above table; moreover, it offers an econometrical point of view in the current study. In addition, the Durbin-Watson has a value of approx. 2.5. Following the above table, the value with two asterisks symbolizes the case that the coefficient is below the 0.05 significant level. The values with three asterisks are for the coefficients that are below the value of 0.01. Thus, the indexes reveal Poland's distribution of money and the form of its economic structure (see Table 2). The first three rows of the table reveal that the *p*-value is important, and therefore the initial hypothesis has been rejected and the model is accurate. The fourth row is expected to be above the

Table 1. Poland's OLS analysis

Variable	Coefficient	Standard error	*p*-value
Constant	−1.35898e+06	32524.2	0.0006 ***
Poland's financial deposits	26009.3	1301.10	0.0025 ***
Poland's GDP per capita	55.8946	1.41381	0.0006 ***
Global index of the cycle of money (log)	19515.6	3342.13	0.0455 **

Source: Own compilation.

0.1 *p*-value, as the global index of the cycle of money is independent of any country's rate, since in most cases, the country has a very small amount of the aggregate value. Hence, based on the estimations and the theoretical background it the condition of the economic structure of the country may be determined as well as the fact whether Poland belongs to the group of very good economies. According to these results, it is possible to clarify the condition of the cycle of money in Poland.

Table 2. Poland's index of the cycle of money

Year	Financial Deposits Global Average per GDP (%)	Financial Deposits Poland per GDP (%)	Global GDP per Capita ($)	Poland's GDP per Capita ($)	Index of Global Average Cy ($)	Index of Poland's Cy ($)
2012	52.48	48.84	16,653.01	25,457	873,949.96	1,243,319.88
2013	53.96	50.39	17,266.62	26,650	931,706.82	1,342,893.50
2014	55.81	51.92	17,159.02	27,797	957,644.91	1,443,220.24
2015	59.38	53.57	15,295.71	28,683	908,259.26	1,536,548.31
2016	60.77	55.75	15,330.03	30,065	931,605.92	1,676,123.75
2017	60.07	55.69	15,082.49	31,674	906,005.17	1,763,925.06
Results					5,509,172.04	9,006,030.74

Source: Globaleconomy.com and author's compilation.

Figure 1 presents the situation of financial deposits of Poland's financial system, as a percent of GDP, for the period of 2012–2017. Next, Figure 2 presents Poland's GDP.

Figure 2 presents the GDP condition of Poland's economy for the period between 2012 and 2017. Also, the next scheme presents the GDPs of Poland, for the same period.

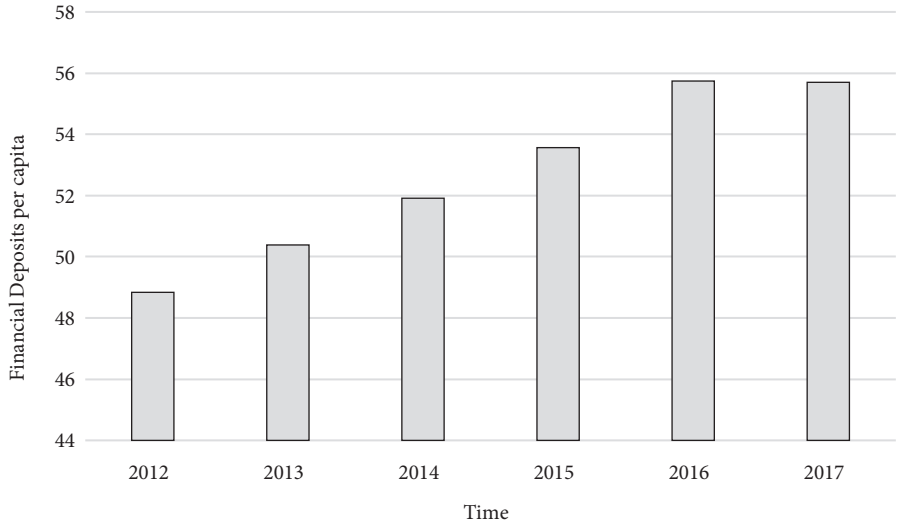

Figure 1. Poland's financial deposits
Source: Globaleconomy.com.

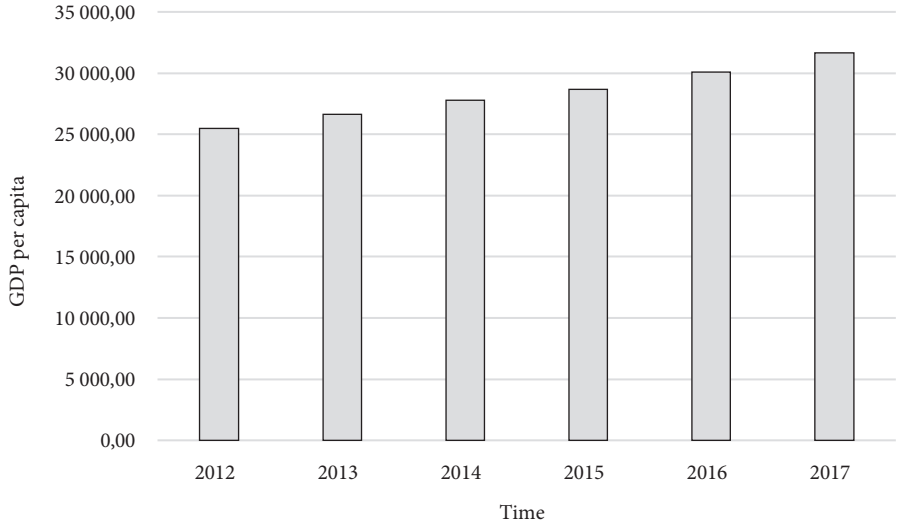

Figure 2. Poland's GDP per capita
Source: Globaleconomy.com.

According to prior results, the index of Poland's c_y is \$9,007,931.18 We obtain from the results that the index of the global average c_y is \$5,509,172.04.

Calculating the general index of the cycle of money both for Poland and globally, we obtain the following results:

– The general index of c_y for Poland is $g_{cy\ Country} = 0.62$
– The general index of c_y of global view is $g_{cy\ Average} = 0.5$

Therefore, it is concluded that Poland's index of the cycle of money is close to the global average cycle of money. Thus, the dynamics of Poland's economy complies with the global average and its structure is close to the initial hypothesis. As a result, Figure 3 may be presented:

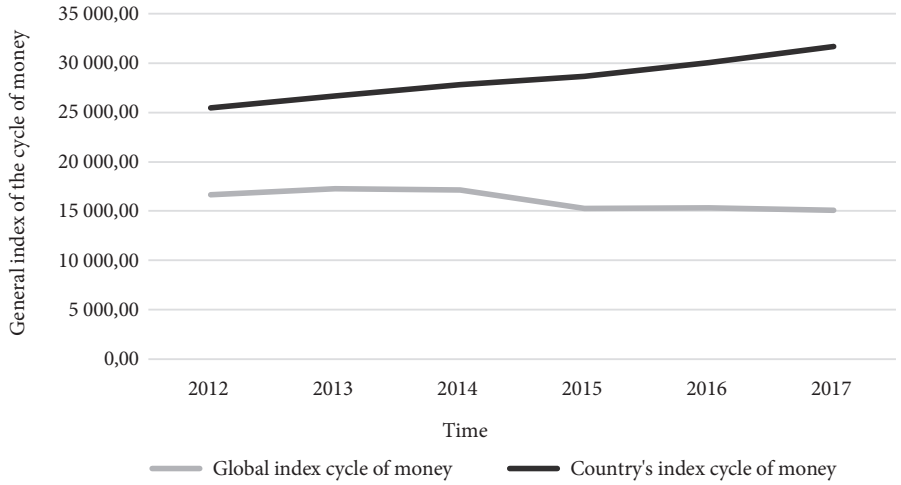

Figure 3. The index of the cycle of money
Source: Own compilation.

Figure 3 shows that the index of the cycle of money of Poland's economy is above the global average of the index of the cycle of money, which is 0.5 (considered as a global constant). Poland's index of the cycle of money is 0.62. The countries that are close to 0.5 have a well-structured economy—based on eq. (5), using the theoretical background of the cycle of money. Thus, it may be concluded that the economic structure of Poland has an upper distribution of money to its economy. Poland could proceed to more reforms, as the international and bigger companies still substitute the local medium and small companies. The authorities should apply the fixed-length principle, then higher taxes should be implied on larger companies. Therefore, the distribution of money inside the economy will increase, and social welfare will be ameliorated. The government should protect small and medium companies more in order to avoid losing money from the transactions of larger companies.

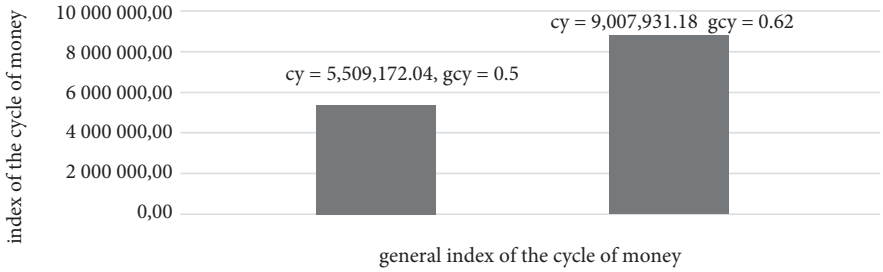

Figure 4. The cycle of money indexes
Source: Own compilation.

Figure 4 presents the general index of the cycle of money.

The previous figures have presented the combination of the index of the cycle of money with the case of the general index of the cycle of money. What is shown is the connection between the global average indexes and Poland's index. Poland belongs to a group of countries which are above the global average index of the cycle of money, both for the simple index and general index.

Conclusions

The current theoretical concept is the only one that reveals the structural characteristics of the economy by the functionality of the economy. This is the only work which presents Poland's index of the cycle of money. Additionally, the decision of the G7 for a minimum tax rate of 15% is acknowledged by the fixed-length principle that comes from the theory of the cycle of money (Challoumis, 2019a, 2019b). Poland is above the worldwide average index of the cycle of money. Figures 2 and 3 show that Poland's distribution of money is to an upper rate. The cycle of money of the country permits a very good distribution of money. The losses of the local banks are to an upper degree. Besides, the country's economy could be better due to the fact that an amount of money is excluded from the local financial system by worldwide transactions (see Table 2). The structure of the economy is directly connected with the distribution and reuse of money, which are bound, affirming the strength of an economy to a potential crisis.

The implementation of the cycle of money could be applied in two steps. Initially, the authorities must impose a low tax rate on small and medium enterprises and at the same time a high tax rate on big enterprises that substitute the activities of the smaller ones. Larger companies must invest in factories and know-how technological units. Thus, the authorities should impose a low tax rate on big companies for these activities. Furthermore, the authorities must

allow the economy to act to more appropriate perfect competition, after the implication of the first step's diverse tax policy, thus facing monopolies and oligopolies. The contribution of the paper is sufficient to the current research, as it clarifies for the first time the general index of the cycle of money of Poland. Poland can counteract an economic crisis according to its index of the general cycle of money because it is above the minimum value of 0.2 and the average rate of 0.5. Poland's financial dynamics is above the worldwide average cycle of money, as the value of 0.62 indicates that Poland's economy has an appropriate distribution of money.

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