Edited by Witold Nowiński, Jan Rymarczyk, Kazimierz Starzyk

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IMPLICATIONS FOR THE ECONOMY

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Preface

COVID-19 has been one of the most important developments in the 21st century globally. Apart from claiming millions of lives (see chapter 10 of this book), it has had a profound impact on economies around the world, both at a micro and macro level.

At a micro level, it affected numerous businesses, including their international activity. Global value chains have been disrupted by lockdowns presenting new challenges to international sourcing and sales (see chapters 1 and 2). The impact of the pandemic was particularly high in tourism and hospitality. This in turn was reflected in the financial situation of businesses from this sector but also by regions relying on tourism and hospitality as their major sources of income (see chapter 6).

At a macro level, effects of COVID-19 led to numerous policy interventions aimed at minimizing its impact on economies and societies (chapter 7). When international linkages are considered, the effects of the pandemic were experienced in global trade and financial flows (chapters 8, 9). It remains to be seen how long lasting these effects will be, although besides the direct effects we need to observe the indirect ones, where the pandemic could have impacted the world indirectly by triggering new challenges, both in the economic realm, such as the inflationary pressures that we are currently experiencing, and in the geopolitical realm where the pandemic has accelerated certain processes and conflicts.

Although by the end of 2022 the COVID-19 pandemic appears to be fading and the world is beginning to return to normal (chapter 3) we should not forget to draw conclusions from the dramatic consequences of this pandemic, especially as future pandemics cannot be excluded. Hopefully, this volume can offer insights that can help us to prepare better for such an unwelcome but not impossible future.

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PART I
COVID-19 IMPLICATIONS — MICRO APPROACH

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Reconfiguration in the Apparel Industry's Global Value Chains During the COVID-19 Pandemic

Abstract. During the last few years, international and domestic supply chains have been affected by the COVID-19 pandemic and this has resulted in serious disruptions in companies' global value chains (GVCs). This chapter explores the motivations and actions made in global apparel industry value chains during the COVID-19 pandemic and in the post-pandemic business environment. The study has been provoked by ongoing discussions and expectations of the regionalization of global value chains (GVCs) which should occur as a consequence of the challenges and issues caused by the pandemic. The primary aim of this chapter is to provide empirical evidence on the reconfiguration of GVCs, particularly the changes in buyer-supplier relations in the global apparel industry during the COVID-19 pandemic. The business news media serves as empirical data for the conclusion, that decisions and actions in the apparel industry GVCs are mostly short-term reactions to the supply issues that occur due to the COVID-19 pandemic and the recent geopolitical shock caused by the war in Ukraine.

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JEL classification: F20, F23, L2, L6
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1. Introduction

The COVID-19 pandemic affected many businesses, and companies have reported disruptions in their global value chains (GVCs). Governments implemented lockdowns, which affected countries' economies very broadly, including economic effects on international and domestic supply chains. The economic impact of COVID-19 has strengthened the trend toward GVC reconfiguration to improve resilience, responsiveness, and efficiency. As previous studies have noted, reconfigured GVCs are organized for collaboration among geographically close economies (Gandoy & Diaz-Mora, 2020). GVCs are not static, their arrangements and relationships alter over time either as a result of changing industries

or macro-environmental shifts and unexpected changes (Kano et al., 2020), such as the COVID-19 pandemic, thus governance of the value chains has become very important nowadays. The COVID-19 pandemic has been defined as a "global shock" and it has caused major global disruptions to GVCs. Companies have tried to adopt strategies seeking to recover GVCs and achieve resilience, flexibility, responsiveness, and sustainable operations. Due to the COVID-19 pandemic, many supply chains around the globe have faced significant disruptions in vertical up and downstream, affecting demand and supply and making it imperative to study policy-making decisions and managing strategies in supply chain operations (Nikolopoulos et al., 2020).

This chapter explores the motivations and actions adopted in global apparel industry value chains during the COVID-19 pandemic and in the post-pandemic business environment. Previous research has stated (Pla-Barber et al., 2021; Elia et al., 2021), that recent works studied the governance of GVCs after the COVID-19 pandemic mostly from theoretical perspectives, thus more empirical evidence is needed. This prompted following research questions: did the pandemic global business environment encourage the apparel industry's GVCs to regionalize? and what is the motivation for GVC-related short- and long-term actions over the COVID-19 pandemic?

The study aims to provide empirical evidence by analysing business news media publications on the reconfiguration of GVCs, particularly buyer-supplier relations in the global apparel industry and their short and long actions during the COVID-19 pandemic. The apparel industry was selected as a relevant case to explore regionalization patterns empirically, as this industry is one of the most globally spread between regions in terms of buyer-supplier relations. Moreover, the apparel and textile sector is the 4th biggest sector in the world, hence its impact on the environment, society and economics is huge (Vilaça, 2022).

The chapter contributes to GVC literature and literature related to COVID-19 effects on industries, particularly to empirical studies on this topic. It is in line with Boudreau & Naeem (2021), in which the authors analysed the economic effects of COVID-19 on ready-made garment factories in Bangladesh. It also responds to calls for "more in-depth case-based studies examining the dynamic nature of GVCs" (Mostafiz et al., 2022).

The chapter is organized as follows. First, the theoretical approach concerning the reconfiguration of GVCs is introduced with a particular focus on the changes in buyer-supplier relations and their responsive actions to the COVID-19 pandemic. At the end of this section, the conceptual framework for the rationale for GVCs configuration-related decisions and actions in the pandemic business environment is developed. This framework works as a conceptual background for empirical research. Second, the methods are provided. Third, the findings and practical implications are discussed. Finally, conclusions and suggestions for future research directions are presented.

2. Theoretical approach

The responsiveness of Global value chains to the COVID-19 pandemic

Global value chains are defined as the connected functions and operations through which services and goods are manufactured, distributed and consumed in a global scale (Kano et al., 2020), GVCs are also known as globally dispersed networks (Buckley & Ghauri, 2004) that are described by a wide range of cross-border, value-creating activities that are needed to create a product or service from its design, sourcing of raw materials, intermediate cost calculations, production, marketing, distribution and support to the end user (UNCTAD, 2020). Since GVC activities are interlinked, the COVID-19 pandemic has had a profound effect, thus the responsiveness of GVCs to the pandemic became an essential aspect.

Research (Modgil et al., 2022) has shown that resilient supply chains are necessary to identify the various risks and applications of products, to analyse the market and the different scenarios that can cause problems for the manufacturing company and its supply chains, as well as to properly reconfigure the chain and activate it in order to achieve the best result. Thus, there are already some recent studies on GVC resilience that emphasise the necessity for the flexible use of suppliers from the domestic market and developed national and regional value chains, integrating GVCs to achieve cycle goals (Tang, 2006; Song et al., 2021), that stress the importance of having a stock buffer and backup sources (Vanpoucke & Ellis, 2019), that address the need to share the risk with external partners within the supply chain and its influences on resilient and robustness capabilities to deal with disruptions (Manuj & Mentzer, 2008; El Baz & Ruel, 2020) and focus on the necessity to sustain the network of external relationships in the supply chain and create relational continuity (Colm & Ordanini, 2021). The maintenance of vertical relationships, which influence a company's decisions and scope of actions, becomes challenging not only during a disruption but also during the recovery phase (Colm & Ordanini, 2021).

The reconfiguration of GVCs towards regionalization

The COVID-19 pandemic has strengthened the trajectory toward GVC reconfiguration. Earlier pressure on exploiting efficiencies of global supply chains has been replaced by pressure on the reduction of risks through localizing the supplier base (Shih, 2020).

According to Elia et al. (2021), the COVID-19 pandemic is expected to cause changes in GVC governance, the need to rethink the GVC paradigm, and reconfiguration of GVCs according to four alternative trajectories: reshoring, regionalization, replication, and diversification. As a result of reshoring, value chains will become shorter and geographi-

cally less fragmented (UNCTAD, 2020). The reshoring trajectory particularly affects GVCs in high technology intensive industries and is driven by challenges specific to a particular industry and the current configuration of its GVCs. Thus reshoring will lead to divestment activity as a result of which the scale of efficiency-seeking foreign direct investments will decrease (UNCTAD, 2020). In the case of regionalization, value-adding activities may become more fragmented but their nature may also change. Regional market-seeking investment in clusters and broader industrial networks may replace global efficiency-seeking investment. Replication leads to a shorter value chain and a separation of production stages. According to UNCTAD (2020), "this trajectory implies a shift from investment in large-scale industrial activity to distributed manufacturing, which relies on lean physical infrastructure and high-quality digital infrastructure". Diversification leads to a wider spread and diversification of economic activities. In this case "reliance on supply chain digitalization will cause those GVCs to be more loosely governed, platform-based and asset-light, and value capture in host countries will become more difficult" (UNCTAD, 2020). The reconfiguration of GVCs with respect to the four alternative trajectories is described in the latest World Investment Report (UNCTAD, 2020), with more emphasis on two of them, as can be expected: reshoring and regionalization, which imply the shortening of GVCs and relocation of manufacturing activities.

In previous research, the reconfiguration of GVCs towards regionalization has been the most discussed. The idea of regionalization is supported by Pla-Barber et al. (2021) in their latest conceptual research. In their view, the pandemic would lead to a reconfiguration of GVCs by initiating "a trend toward a more regional footprint in industries in which resilience and reliability are critical" (p. 204) for recovery after the pandemic. Pla-Barber et al. (2021) emphasized the need for all GVC actors to accept the cost associated with the creation of new infrastructure and technologies and with finding new reliable suppliers. Another reason to regionalize GVCs is based on the research of Kano et al (2020). According to the authors, economically more developed countries, whose enterprises specialize in advanced manufacturing technologies, are much more actively engaged in upstream segments of GVCs. Such countries and firms become key suppliers to other countries in the region, in this way supporting regional integration of production. The motive of geographic reconfiguration of GVCs towards regionalization was supported by Elia et al., (2021) by emphasizing the role of technologies that allow firms to improve coordination, control and to substitute labour with technology. As a result, "making the role of emerging countries less relevant, including in advanced macro regions such as the EU and North America".

The shift to regionalization is unlikely to occur immediately. According to UNCTAD (2020) a stronger tendency toward regionalization and reconfiguration of GVCs will appear in some industries, and value chains will regionalize with different intensities and to various extents. Accordingly, different sectors located in different geographical regions

(Soliku et al. 2021) and different sized companies' resilience factors can be treated in completely different ways. For example, due to the economic downturn caused by the COVID-19 pandemic, sales of companies dealing in apparel more or less dropped all over the world, but larger and more innovative apparel companies suffered fewer losses. Most companies in the apparel industry experienced a shortage of raw materials, some of them were forced to lay off workers, close, stop investing, and experienced a decrease in demand, but survived, despite the various threats to health and other problems experienced by their employees (Boudreau & Naeem, 2021). Thus, to avoid losses and stay in the market, companies have to be resilient to the challenges of the COVID-19 pandemic that are still being faced. The anticipated actions of companies are often analysed prescriptively; the empirical proof is mostly occasional.

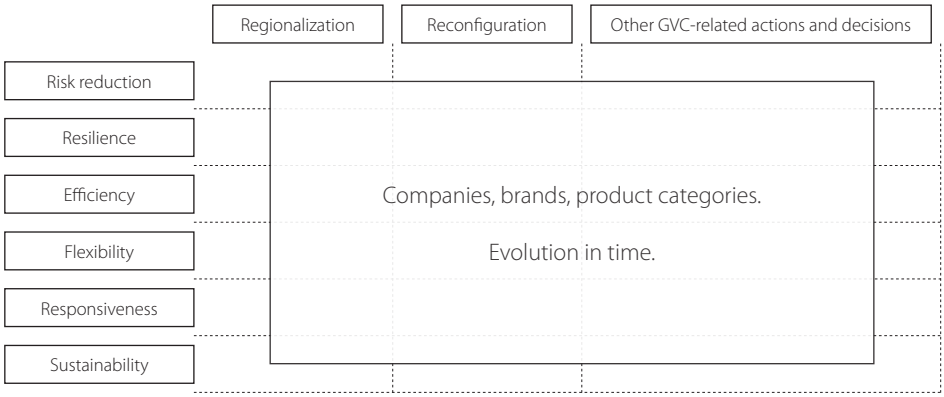
Responsive reconfiguration of GVCs: short- and long-term actions

According to Boudreau & Naeem (2021) the responses of companies in the apparel industry to the COVID-19 pandemic varied substantially. These responses may have included reactive and proactive actions which may be strategically treated as short- or long-term actions. The literature discusses a wide range of motivations, different rationales, and expected GVC-related decisions and actions. For instance, the World Economic Forum (2020a, b) highlighted the need for companies to adapt their supply chains to future trade challenges by setting short-term and long-term priorities/actions. In the short term the focus has to be on transport and production, as well as worker movement, while in the long term, strategies and capabilities, that are related to digital readiness and data sharing should be developed and implemented for supply chains.

During the pandemic, manufacturers could no longer ensure the rapid transportation of goods and efficient manufacturing operations. Manufacturing companies have had to reconfigure their supply chains around the globe, as the pandemic has affected both supply and demand factors. Thus, according to Handfield et al. (2020) the need to reconfigure and orchestrate responsive and resilient supply chains that are sustainable and cost-effective is the most important long-term action. These findings are in line with the research of Pla-Barber et al. (2021), in which the authors state that in the nearest future GVCs will not avoid new challenges and shocks, and therefore propose to establish long-term relationships with local suppliers who are also developing resilient business strategies of their own. Seeking to effectively mitigate the consequences of the COVID-19 pandemic, companies have to assess risks to GVCs, to implement risk monitoring and assessment systems in order to build resilient and responsive GVCs (Pla-Barber et al., 2021). Other researchers (Dolgui et al., 2020) proposed the reconfiguration of GVCs by merging components taken from digital, lean-agile, resilient and sustainable supply chains to adjust to sudden changes.

The empirical data-driven structurization of these motivations and respective actions would offer a significant input to the current knowledge base, providing some more stable background for conceptualization in the field of post-pandemic GVC regionalization and further modelling of GVC development.

Figure 1. The rationale for GVC configuration related decisions and actions in the pandemic business environment: a summary of literature review and background conceptual framework for empirical research



The empirical research aims to provide evidence observed in the global apparel industry on interactions between motivation, reasoning, and an overall rationale for GVC configuration-related decisions and respective actual changes, actions, or even long-term business strategies. The outcomes of the empirical research will serve as a background from which to draw some conclusions on the endurance and orientation of GVC regionalization and following reconfigurations in the global apparel industry.

3. Methods

The empirical research was carried out to explore the motivations, reasons, and overall rationale behind the changes in the apparel industry's GVCs during the COVID-19 pandemic. The literature review provides some initial ideas which need to be proved and structured on the empirical data basis. This means that the research is done based on the deductive perspective. However, as common in qualitative research design, inductive outcomes are also expected to extend and enrich current knowledge based on previously conducted research. The global business news media publications reporting on events that are covered by the research topic are taken as the main data source.

The question for empirical research is: what were the GVC-related decisions or actions and their respective motivations that occurred during the COVID-19 pandemic

in global apparel industry value chains? To answer this question the following steps were taken:

1. A Google search for news covering the topic of the apparel industry's value chains was made. The exact search query was: [(garment OR apparel OR textile OR clothing OR clothes) AND ("supply chain" OR "value chain") site:bloomberg.com]. The Google search, instead of a direct search in news platforms was carried out to maintain the same approach across different news platforms. Other terms close to apparel were included in the search query to cover the possible use of these words as synonyms for apparel. The limitation to a single data source was due to limited institutional full-access subscriptions to the full content of the news media services.
2. Search results were confined to the May 31, 2018 – May 31, 2022 publication date range to cover the pre-pandemic and pandemic timespan. The search itself was done on June 19, 2022.
3. A total number of 252 publications was identified. These publications were collected with MaxQDA Web Collector and imported to the MaxQDA project for further qualitative text analysis.
4. The collected secondary data were first coded by the authors separately. The data coding was done in a classical way, i.e., by reading the text and labelling relevant pieces with the abstract codes. Text coding allows the data to be concentrated and thus extracts the essential information suitable to reason the main conclusions of the research. Initial codes then were merged into a single code system, which served as a background for the final conclusions. All coding-related agreements were achieved by discussions between the authors.

Following the conceptual framework that emerged as a literature review summary (Figure 1), the relevant pieces of data were first coded with the sub-codes from "GVC-related changes, decisions, actions" and respective "reasons, rationale, motivations" code categories to generate a conceptual summary reflecting a matrix of empirical evidence built by the intersections of subcategories. Multiple or co-occurrence coding approaches were applied (Saldana, 2015).

The same segment of the text was then coded with the additional attribute codes providing more data on certain evidence, including the publication date, product category, location, brand, and/or company names. The whole code system that emerged as the result of qualitative data analysis is presented in Figure 2.

The intersections of sub-codes from "GVC-related changes, decisions, actions" and respective "reasons, rationale, motivations" code categories provide empirical evidence on the ongoing GVC regionalization in the selected global apparel industry. The other

codes that appear in these intersections helped to explain when, where and under which conditions GVC regionalization-related actions took place.

Figure 2. Code system. Summary of qualitative business news analysis

1 Locations	4.12 2021-12-21
1.1 Europe	4.13 2022-02-01
1.2 Online	4.14 2022-02-11
1.3 Indonesia	4.15 2020-02-26
1.4 UK	4.16 2022-04-19
1.5 USA	4.17 2022-05-06
1.6 Pakistan, Bangladesh, Asia, not China	4.18 2022-05-12
1.7 Leicester, U.K.	4.19 2022-05-18
2 Product categories	4.20 2022-05-28
2.1 Textile and clothing in general	5 Supply Chain Issues Related Reasons - SCIRR
2.2 Fast-fashion	5.1 SCIRR: Delayed deliveries
2.3 Luxury fashion	5.2 SCIRR: Increased freight / transportation costs
3 Companies / Brands	5.3 SCIRR: Decreased inventory due to supply chain issues
3.1 Zalando	5.4 SCIRR: Increased inventory due to late delivery
3.2 Inditex / Zara	5.5 SCIRR: Demand fluctuations due to lockdowns
3.3 H & M	6 Long-Term Business Strategy related Motivations - LTBSM
3.4 Nike	6.1 LTBSM: To expose soc. env. responsibility
3.5 American Giant	6.2 LTBSM: To ensure deliveries
3.6 RealReal and [second hand platforms]	6.3 LTBSM: To improve quality control
3.7 Joules Group Plc	6.4 LTBSM: To increase speed to market
3.8 adidas	6.5 LTBSM: To gain flexibility and quality
3.9 Victoria Secret	6.6 LTBSM: To have sustainability benefits of locally made good
3.10 Under Armour	6.7 LTBSM: To maintain resilience
3.11 Walmart,Macy's, Costco, Target, Gap	6.8 LTBSM: To improve Image, and reputation
3.12 Shein [China, on-line retailer]	7 Re-Active Actions - RAA
3.13 Boohoo	7.1 RAA: Decision / action is not clear
3.14 Kering	7.2 RAA: Secure goods and stock up on inventories
3.15 Gucci	7.3 RAA: Ordering earlier than usual
3.16 Saint Laurent	7.4 RAA: Temporal orders' cancelation
4 Dates	7.5 RAA: Shift to second-hand retailing
4.1 2019-08-20	8 Pro-Active Decisions - PAD
4.2 2020-04-20	8.1 PAD: Proximity sourcing
4.3 2020-06-25	8.2 PAD: Diversification of suppliers
4.4 2020-09-25	8.3 PAD: More localised supply chain
4.5 2021-03-16	8.4 PAD: Supply chain concentration
4.6 2021-06-15	8.5 PAD: Increasing visibility
4.7 2021-08-27	8.6 PAD: Imposing higher standards
4.8 2021-09-17	8.7 PAD: Virtual integration
4.9 2021-09-30	8.8 PAD: Pushing the suppliers to adapt
4.10 2021-10-23	8.9 PAD: Boosting the use of more sustainable materials
4.11 2021-11-09	8.10 PAD: Education and training for buyers

Research limitation.

1. Only one data source (i.e. bloomberg.com) is explored. Other sources of business news media will be added in the coming phases of the research to cover a full range of facts and perspectives.
2. The media news might be biased by the interests and attitudes of publishers, authors, and other factors. Later stages of the research should include other methods to consider and prove if necessary, conclusions based on media news as the main data source.
3. Though business news media is appropriate to cover a wide range of events, it does not provide in-depth analytical insights and expertise, which might also limit the relevance of the research conclusions.

4. Findings and Implications

Only a small proportion (around 15%) of collected business news published by Bloomberg was considered relevant, i.e., providing empirical data appropriate to answer research questions. There were near to 50 code intersections from more than 20 documents, that to some extent explain the phenomenon of GVC regionalization.

After several iterations of content analysis of coded segments, it was concluded that both motivations and respective GVC-related actions split into two main categories. Two motivation and two action categories built a typology for the categorization of motivations and actions, which is discussed at the end of the paper as the main implication of this research. The reasoning and motivation for GVC-related decisions were clustered around Supply Chain Issues Related Reasons (SCIRR) and Long-Term Business Strategy Related Motivations (LTBSM) parent code categories. Actions, changes and applied decisions were summarised respectively as Re-Active Actions (RAA) and Pro-Active Decisions (PAD) code categories. Figure 2 lists the child codes of these main analytical categories along with all other codings that were made during the data analysis. The given abbreviations — SCIRR, LTBSM, RAA, and PAD — are references used later in figures 3, 4, and 5, which represent visual maps of code interactions.

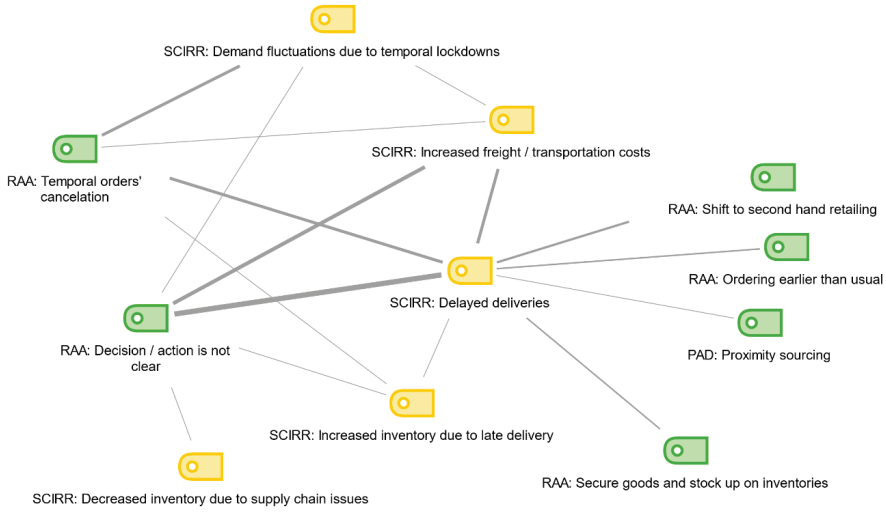
Besides the main research question-related coding, coded text segments were also labelled by date, location, product category and brand/company name codes, which provide broader insights into the analysed data coverage in terms of time, geographic, and industry actors' perspectives.

Figure 3 indicates the vertically listed SCIRR category codes located in the centre from the top to the bottom of the code interactions map (marked yellow) surrounded by the RAA and PAD category codes (marked green). The visualisation of code interactions

(or co-occurrences) shows that SCIRR-based motivations called mostly for RAA-type responses. The cluster of short-term reasons and motivations occurred because of the pandemic. The GVC-related actions here are motivated by increased costs, delayed deliveries, and inventory-related issues (Figure 3). The actions here are also reactive, not strategic, and not long-term vision-focused. The only intersection of SCIRR motivation with proactive actions was proximity sourcing as a response to delayed delivery caused by GVC issues related to action motivation.

The code interactions map (Figure 3) also reveals that all SCIRR motivations have interactions with a code, indicating that the actual action or decision is not yet clear. Temporal order cancellation was found to be the most widely spread reaction to the motivation of SCIRR for GVCs relevant managerial solutions; this action is a relevant solution for all mentioned SCIRR. Delayed deliveries is a SCIRR that was solved by the widest range of different means of GVC management. Most of the responses were classified as RAAs; the only GVC reconfiguration-relevant response, categorized as PAD, was the decision to source from nearby suppliers (coded as proximity sourcing). All other observed solutions for delayed deliveries are reactive actions, short-term solutions, which would not result in enduring GVC reconfiguration. The line thickness indicates the relative frequency of the particular code interaction; a thicker line means a higher frequency of code interactions.

Figure 3. The map of co-occurrences among Supply Chain Issues Related Reasons, Re-Active Actions and Pro-Active Decisions code categories

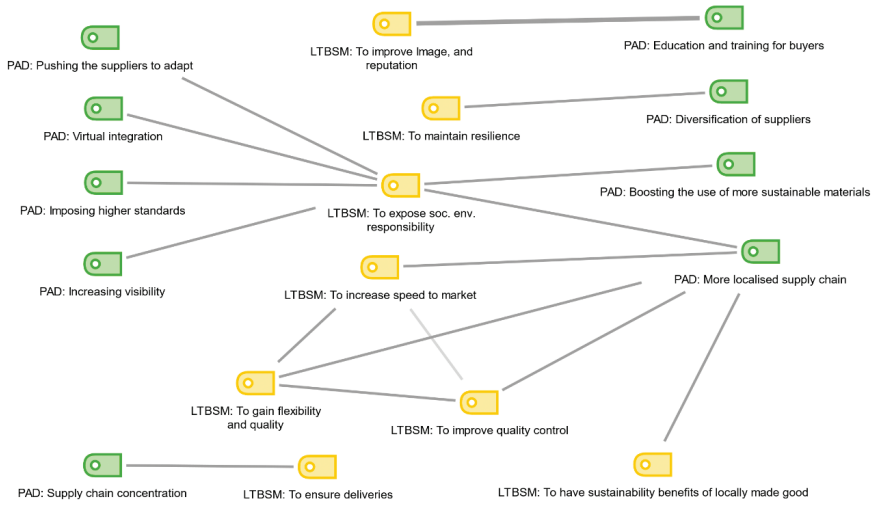


Social and environmental responsibility, corporate image and other LTBSMs (Figure 4) are not caused by the pandemic. They call for a range of actions that are to some extent related to the reconfiguration of the GVCs. An attempt to have a more localized supply

chain is a decision taken to respond to a wide range of LTBSMs. The need to ensure social and environmental responsibility is associated with the largest number of different PADs. Some of the LTBSMs were found to be solved with only one PAD (Figure 4). Other LTBSMs were found to be addressed by only a single particular PAD. However, it should be noted that the frequency of codes and co-occurrences of its interactions should not be taken into consideration due to the limited amount of qualitative data collected and considered during this investigation and the overall tradition of generalization of qualitative research conclusions.

Although the data are qualitative, which does not allow one to conclude quantitatively, it still suggests that SCIRRs and respective reactions are more widespread compared to the LTBSMs and interconnected PADs. This proposition is worth addressing and verifying in future quantitative research based on the deductive design developed by following the results of the current study. In the present work, the spread difference between SCIRRs and LTBSMs in the global apparel industry is highlighted by interconnections of SCIRR and LTBSM category codes with the date attribute (Figure 5). The code co-occurrences network presented in Figure 5 also highlights interconnections, captured by code co-occurrences, with the company/brand names which sheds light on the industry actors' coverage of the collected data.

Figure 4. The map of co-occurrences among Long-Term Business Strategy related Motivations, Re-Active Actions and Pro-Active Decisions code categories



The SCIRR code category representing the Delayed deliveries issue is found to be central and the most widespread reasoning/motivation for some GVC reconfiguration actions and/or decisions. The collected business media news data indicate that companies

in the global apparel industry began to meet the Delayed deliveries at the beginning of 2021 and this continued throughout the whole pandemic. Another SCIRR noticed during COVID-19 is Increased freight/transportation costs, which is interconnected with other SCIRRs. The most frequent co-occurrences (indicated by connection line thickness) are between SCIRRs Delayed deliveries and Increased freight/transportation costs, but many other code interactions within the same SCIRR category also are observed.

It is also evident from the code interactions map presented in Figure 5, that LTBSMs were relevant in the pre-pandemic and early-pandemic times. Then SCIRRs started to shape GVC-related managerial actions and decisions. Finally, pandemic relief achieved in the first half of 2022 brought GVCs management LTBSMs back to the fore; assurance of deliveries, sustainability benefits of locally made goods, flexibility and speed to the market are LTBSMs that appear at the end of the pandemic. Social and environmental responsibility, image, reputation and resilience were the main LTBSM category motivations in the pre- and early-pandemic times. SCIRRs are still present up to the end of the research period (Figure 5).

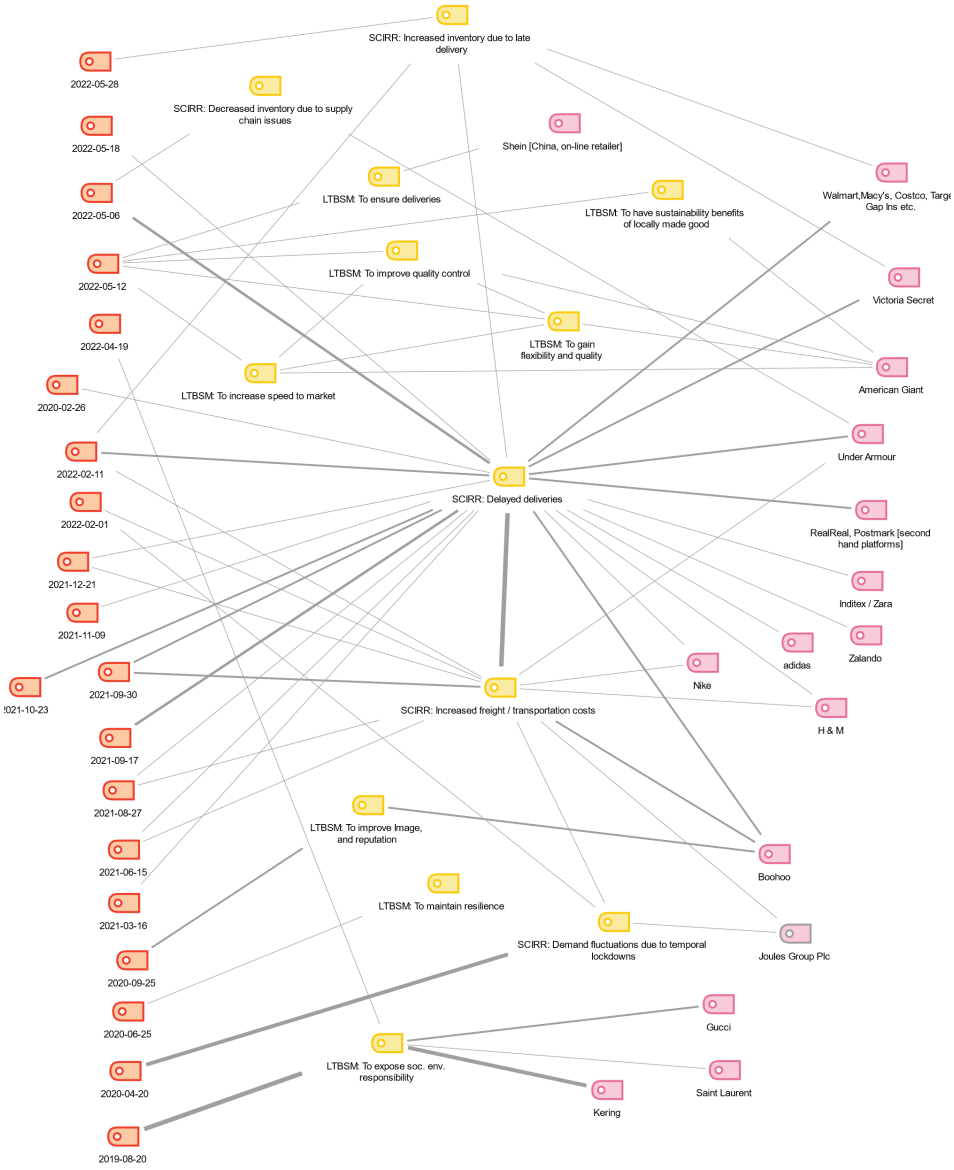
The present research does not allow us to conclude reliably on the company clusters facing either SCIRR or LTBSM category reasoning and motivation; it is just noted that all companies, those working in fast fashion as well as luxury apparel sectors face the same challenges.

The above-reviewed prevailing SCIRR interactions with RAAs (Figure 3) and LTBSM interactions with PADs (Figure 4) lay the foundations for the central conclusion of this research: the reshoring and respective regionalization of GVCs in the global apparel industry are not triggered by COVID-19 pandemic-related reasons; the motivation for proactive decisions and changes in GVC configuration is found in a range of LTBSMs. The actions here categorised as RAAs would not result in reshoring or GVC reconfiguration; these actions are short-term reactions to the changes in the business context and issues that were brought with these contextual changes. Cancellation of orders, corrections of ordering time, secure goods and inventory stock-ups — are actions that would not reconfigure GVCs for a long period. Most of the decisions here categorised as PADs, in contrast, would result in GVC reconfiguration over a long time: e.g., supplier adaptation, virtual integration, diversification of suppliers, and especially — more localised supply chain organization.

The findings of this research are partly in line with the conclusions provided by Barbieri, et al. (2020), who noticed that "reshoring emerges either as an adjustment to modified contextual conditions (or unexpected issues in the firm's global footprint) or as a move for achieving strategic re-alignment". Our research supports only the latter conclusion. "The adjustment to modified contextual conditions", which were created by the COVID-19 pandemic, did not lead to noticeable regionalization in the global apparel industry. However, this does not mean that the regionalization trend is not relevant here. Regionalization is gaining momentum, but it is motivated by "a move for achieving stra-

tegic re-alignment". The COVID-19 pandemic was a trigger for short-term decisions and respective actions, while long-term relocation strategies were found to be motivated by attempts to reduce risk, ensure quality, and better respond to the needs of local customers' needs, which are foreseen as long-term strategic goals (Barbieri et al., 2020).

Figure 5. Data coverage: The map of co-occurrences among Supply Chain Issues Related Reasons, Long-Term Business Strategy related Motivations categories codes, publication Date and Company Name data attributes



This study adds value to the scientific discussion on the reshoring of GVCs by providing granular lists of motivations and the respective actual decisions, based on evidence from the global apparel industry. The highlighted prevalence of interactions between SCIRRS and RAAS, as well as LTBSMS and PADS, express to some extent the underlying backgrounds of apparel industry GVC regionalization, which allow foresight of coming trends and reshoring trajectories.

The two categories of reasoning and motivation for the reconfiguration of GVCs and two categories of respective actions and decisions are arranged in a 2 by 2 matrix, which provides the final conceptual approach to GVC reconfiguration based on the interactions between different motivations and actions (Figure 6). This approach explains that long-lasting and enduring GVC reconfiguration requires a stable context with anticipated developments where companies would be able to plan and implement their long-term business strategies. An environment disturbed by a pandemic or other (e.g. geopolitical) issues and tensions is not relevant to GVC reconfiguration focussed decisions. Although some GVC management actions are implemented in a disturbed global business environment, these actions mainly are done to solve short-term issues to ensure and maintain activities. Regionalization which is a strategic and long-term decision would be difficult to implement in destabilized global environments.

Figure 6. Conceptual approach to GVC reconfiguration based on interactions between different motivations and actions

		GVCs focused actions	
		Re-active actions	Pro-active decisions
Reasoning / motivation	Reasoning associated with supply issues caused by pandemic and geopolitical tensions	Relevant in a disturbed environment, does not result in GVCs reconfiguration, short-term issues are solved	Not relevant due to the need for quick response
	Motivation based on long-term business development strategy	Not relevant due to the nature of long-term strategy	Requires for stable context with anticipated developments and results in GVCs reconfiguration

The interactions between disturbed environment-caused reasoning and long-term focussed proactive decisions were not found to be relevant as was the opposite interaction between strategic goal-based motivations and short-term reactive responses. The former interaction is considered as not relevant due to the need for a quick response to solve current-day issues, while the latter is found to be not relevant due to the nature of long-term strategies, which should not be implemented by short-term reactive responses and actions.

Practical implications are related to the use of our findings to inform an appropriate governmental — policy response and to facilitate planning for recovery from the

COVID-19 pandemic for companies that orchestrate their global value chain in the apparel industry.

The generalising conclusions discussed above are relevant and worth addressing in further research. The main implication is that ongoing regionalization should not end or stop with the end of the pandemic. The underlying reasons will remain relevant in the post-pandemic global business context. It may be expected that the post pandemic period will bring long-term business development-based motivations to the fore in GVC management strategy. On the other hand, current geopolitical tension, war in Ukraine and its associated uncertainty, suggests that value chain management based on a long-term strategy may be relegated to an undefined future. Government representatives and other local stakeholders should be prepared for increased demand for local supplies, for local support and business services to ensure fluent reshoring of global companies, which were more active overseas than locally. But these expectations should be considered in terms of global and local business conditions. A stable context characterised by anticipated future developments would increase the demand faced by local suppliers. However, a disturbed environment, characterized by short-term decisions, is not suitable for sustained GVC reconfiguration.

5. Conclusions and future research directions

Although recent research (Elia et al 2021; Pla-Barber et al, 2021; Mostafiz et al. 2022) has emphasized the reconfiguration of GVCs towards regionalization during the COVID-19 pandemic, our empirical research did not reveal any noticeable regionalization in the global apparel industry. This does not mean that the regionalization trend is not relevant. The direction towards regionalization is there, but in coordination with other strategic goals. Thus, we make a call for research in terms of the need for more empirical research on the topic.

Looking at the empirical results, it is possible to state that the reactive motivation for GVC-related decisions is considerably wide spread compared to proactive reasoning aiming at strategic, long-lasting shifts to regional supply chains. Reactive reasoning is not always associated with clear actions. The business media only reports that companies meet supply chain-related issues, including increased transportation costs and delayed deliveries, but any respective decisions and/or actions remain unclear and are not described. Proactive motivation and reasoning, on the other hand, are related to more defined and exact actions and strategic decisions.

It is long term business strategy-related motivations that were relevant in pre-pandemic and early-pandemic times after which supply chain issue related reasoning began to shape GVC oriented managerial actions and decisions. Finally, the pandemic relief which arrived in the first half of 2022 restored GVC management strategic motivations.

It can be concluded that the pandemic arrangements of the apparel industry GVCs are dominated by short-term reactive and temporal responses to supply issues. These decisions are not strategically oriented. Proactive GVC reconfiguration strategies are emerging but are still rare. The balance between a reactive response to supply challenges and proactive long-term regionalization remains on the former side.

Despite providing some interesting insights on the topic, there are also some limitations. These include a limited generalization of the findings and application of our theoretical model. Our study was primarily based on global business news media publications reporting on the events that are covered by the research. Although we achieved useful results, future studies should test the conceptual model by using other empirical qualitative methods, such as interviews with managers.

Another limitation is related to the fact that our findings cannot be applied to other industries. Thus, future research should cover the GVCs in other industries (including low and high value adding), and their companies' long and short-term actions as a responsive result of the COVID-19 pandemic.

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The Impact of the COVID-19 Pandemic and Government Assistance Programs on SMEs in the State of California

Abstract. The international trade in goods showed remarkable resilience and set a new record in Q3 2021 despite the impact of the COVID-19 pandemic. Using primary data from California, this study focuses on the perceived effectiveness of a critical driving force, the government assistance programs, including traditional export assistance programs (EAPs) and COVID-19 economic assistance programs (CEAPs), by the small and medium-sized enterprises (SMEs) engaged in international trade before and during the pandemic. Results from the SMEs survey and data gathered from semi-structured interviews with EAP representatives and community bankers indicate that certain traditional EAPs were perceived less effective during the pandemic, while SMEs more actively sought specific CEAPs, especially the Paycheck Protection Program and Economic Injury Disaster Loan. Furthermore, community banks played a vital role as a bridging agent in government assistance programs which could be extended and enhanced in the post-pandemic era.

Keywords: export assistance programs, export, COVID-19 pandemic, SME, international trade, community banks, government assistance benefits

JEL classification: F18, H12, H81

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1. Introduction

Despite the impact of the COVID-19 pandemic and the surge of the Omicron variant, international trade growth continued in 2021. The value of global trade in goods increased in each quarter of 2021. Valued at about US$ 5.6 trillion, international trade in goods set a new record in Q3 2021, with growth significantly higher than pre-pandemic levels leading to an increase of about 13% relative to Q3 2019 (Rakesh, 2022). Recent research also suggests that "the basic efficiency, comparative advantage, and rationalization arguments for global investment and trade will remain irresistible, even in a post-COVID-19 world" (Contractor, 2022).

International trade and firms engaged in international expansion offer the opportunity to enhance competitiveness, profitability, and capacity to generate employment (Freixanet et al., 2021). As the largest economy in the world, the U.S., with its export and import firms, also benefits from international trade. It has been reported that U.S. companies that export grow faster and are nearly 8.5% less likely to go out of business than non-exporting ones. In addition, about 26% of companies that trade internationally significantly outperform their peers. However, interestingly, only 1% of small and medium-sized enterprises (SMEs) in the U.S. export (U.S. Department of Commerce, 2018). The U.S. government has developed numerous export initiatives to increase the participation of U.S.-based SMEs in the international markets. There are also various export assistance programs (EAPs) offered through the U.S. Department of Commerce, Small Business Administration (SBA), U.S. Department of Agriculture (USDA), and other initiatives funded by individual state governments.

Like the U.S., other countries worldwide have created EAPs to support their companies, especially small and young firms, while increasing their national exports, improving their international competitiveness, and augmenting their trade balance (Malca et al., 2020; Monreal-Pérez & Geldres-Weiss, 2019). EAPs usually encompass all public efforts to support and enhance export activities of either specific industries or individual firms. These direct or indirect government support programs are regulated by the World Trade Organization (WTO) (Genctürk, 2010).

California was chosen as the focus of this study due to a large number of SMEs operating there and the size of its economy. Based on the U.S. Small Business Administration Office of Advocacy's 2019 report, there are 30.7 million small businesses which account for 99.9% of all U.S. businesses in the U.S., employing about 59.9 million employees (U.S. Small Business Administration, 2020). California plays a significant role in the U.S. economy. If California were an independent country in 2017, it would have been the fifth-largest economy globally, surpassing the United Kingdom (Segarra, 2018). With an annual GDP of around $3 trillion, California's economy sits only behind the U.S., China, Japan, and Germany, and it has historically derived significant revenue from international trade and tourism.

Additionally, California has been the state with the most significant exporting share within the U.S. (Segarra, 2018). According to the information from the U.S. Department of Commerce (2018), a total of 73,528 companies exported from California locations in 2015. Of those companies, 96% (70,350) were SMEs with fewer than 500 employees, generating 43% of California's total merchandise exports in 2015 (U.S. Department of Commerce, 2018). In 2014, California had both the most exporters (75,722) and the most SME exporters (72,591) of any other state in the U.S. (U.S. Department of Commerce, 2018).

The outbreak of the COVID-19 pandemic had a significant impact on the global and local economies. Various organizations tracked the health and economic effects the COVID-19 pandemic has had on the world (World Health Organization, 2020; International Monetary Fund, 2020). The economic fallout of the pandemic was colossal. Large parts of the economy were locked down to halt the spread of the virus, which led to skyrocketing unemployment. In May 2020, the U.S. Bureau of Labor Statistics announced that 49.8 million people reported being unable to work at some point in the last four weeks because their employer closed or lost business due to the pandemic. This figure remained at a high level of 40.4 million in June and 31.3 million in July (U.S. Bureau of Labor Statistics, 2020).

SMEs in the U.S. were hit hard when the pandemic started. A monthly survey conducted in April of 2020 by the National Federation of Independent Business (NFIB) reported that 72% of small business owners were very concerned about the potential impact of the pandemic on their business compared to 16% collected the previous month (NFIB, 2020). Similarly, the U.S. Census Bureau surveyed in April 2020, with 90% of SMEs reported to have experienced a negative effect on operations due to COVID-19 (Buffington et al., 2020). It is worth pointing out that most states in the U.S. entered various phases of lockdown during March and April 2020.

SMEs located in the heart of California were also not immune to the effects of the pandemic. Even though this region has a global reputation for the high quality, great variety, and output of its agricultural products, COVID-19 severely limited its exportability. Before the pandemic, various fresh, frozen, and processed agricultural products were shipped worldwide. For example, more than 70 percent of the annual production of its tree nuts was exported (ERA Economics LLC, 2020). Some of the challenges these SME exporters faced were increased shipping costs, ports being shut down for extended periods due to pandemic-related health restrictions, and testing requirements.

To address the challenges caused by the pandemic, governments introduced various COVID-19 economic assistance programs (CEAPS) to bolster their economies. In the U.S., the Coronavirus Aid, Relief, and Economic Security (CARES) Act (2020) and the Coronavirus Response and Consolidated Appropriations Act (2021) provided over $2 trillion in fast and direct CEAPS for American workers, families, small businesses, and industries, followed by over $1 trillion in American Rescue Plan enacted in March 2021. The ex-

tent of these policies varied, but the primary goal was to provide financial support for businesses, particularly SMEs, by creating more streamlined loan applications, providing direct financial stimulus, and tax deferrals (Dhewanto et al., 2020). In this unprecedented context, Xia, Milevoj, & Goncalves (2021) compared the effectiveness of CEAPs at a local level during the pandemic, as perceived by SMEs involved in international trade. Other researchers have also examined the impact of pandemic-related support on SMEs' survivability during this unprecedented global crisis (Dhewanto et al., 2020). Geldres-Weiss et al. (2021) investigated the EAPs in South America and their response and strategies caused by the COVID-19 pandemic. The objective of this paper was to fill the current void in the extant literature by investigating how a global crisis influenced the SME's perception of government assistance programs and the impact these programs had on sustaining SMEs' international trade efforts.

This study, which is based on our paper "Local response to the global crisis the effect of COVID-19 pandemic on SMEs and government export assistance programs in Central California," published in the Journal of Transnational Management in 2021 with revisions and updates made by the same authors, aimed to determine government assistance's impact on SMEs participating in international commerce during the pandemic and the role community banks played in facilitating this support. Following recommendations from Freixanet (2022) calling for more qualitative investigations of EAPs, a mix-method approach was taken to accomplish this goal by collecting online survey data from SMEs and semi-structured interviews for soliciting responses from community bankers and export assistance agency representatives. The data collection period lasted from July to November 2020. The results of our study highlight the obstacles SMEs encountered during the pandemic, explicitly pointing to the challenges of increased employee absences due to illness or lack of access to childcare, in addition to difficulties in exporting and importing. SMEs implemented new teleworking practices to address such obstacles, amplified marketing efforts and online sales, and offered new or customized products. For some traditional EAPs, SMEs shared their concerns about less effectiveness during the pandemic. Meanwhile, SMEs did seek out more pandemic-specific CEAPs, notably the Paycheck Protection Program (PPP) and Economic Injury Disaster Loan (EIDL) managed by the SBA.

This research contributes to the literature in several ways. First, compared to entrepreneurial and organizational characteristics, the effect of external environmental factors such as EAPs and CEAPs, including government loan incentives, on the performance of SMEs, especially in the case of the COVID-19 pandemic, has received minimal scholarly attention. Scholars have examined how EAPs changed and were adopted during the pandemic, but to our knowledge, no study has examined the role community banks played in facilitating this support (Geldres-Weiss et al., 2021). Given the advantages that import/export SMEs can benefit the domestic economy in employment, innovation, and other areas, it is critical to investigate the effect of public policies on SMEs (Knight & Liesch,

2016). Since there remains a lack of knowledge on the role of such EAPs and CEAPs in influencing the sustainability and resilience of SMEs in times of exogenous crisis, this study offers insights from both primary and secondary data, which can be considered a novel contribution to both streams of knowledge. Second, this study, through the interviews with community bankers, highlights the critical role and future potential that community banks play in the process of implementing EAPs and CEAPs, based on their existing business relationship with SME clients, capability to process and monitor SME-related data, and unique advantage to serve as an information hub. Lastly, our findings and discussion shed light on the directions that could be leveraged for more effective deployment of current and future EAPs and CEAPs.

Our findings provide implications for three distinct audiences, policymakers, SMEs, and other stakeholders like community banks. The policymakers should consider the continuum of services and support needed to address SMEs' challenges. SMEs all have different and unique needs based on the length of time they have been in existence and their accumulated experiences. Therefore, their requirements vary from obtaining general information about a potential overseas market to finding specific international financing options or credit insurance for selling their products abroad. One takeaway for policymakers is not to discontinue programs that are found less useful but to emphasize those most frequently used to maximize the effectiveness of government support efforts.

The decision-makers within SMEs sometimes do not pursue various government support programs due to their bureaucratic nature. SMEs should investigate and leverage such programs more diligently as a strategic mechanism to sustain crises and increase their resilience. Proactive and effective communication with export promotion government agencies, responsible government officials, and community bankers can help. As Leonidou et al. (2011) indicate, SMEs need to proactively engage with EAPs and other government officials for recommendations about providing additional government incentives that may not be readily available.

Community bankers must create stronger partnerships to effectively and efficiently deliver and administer the numerous government support programs available. As evident from our interviews, community banks quickly streamlined processes and secure information for various pandemic-specific CEAPs. These efforts ensured that their SME clients were served and received timely information and financial assistance during the crisis. We suggest that similar efforts can be extended to administer some EAPs after the pandemic.

The paper consists of the following sections. Section 2 provides a brief overview of the extant literature and the development of the research questions, followed by Section 3, describing the research methods and data collection. Finally, the analysis and findings are presented in Section 4, while Section 5 covers the discussion, limitations, and suggestions for future research.

2. Literature Review and Research Questions

Scholarly work on EAPs was first published over five decades ago. It has focused on many topics, including EAPs' impact on firms' performance, usefulness, and joint implementation with other initiatives (Ribeiro & Forte, 2019). EAPs can be classified as providing direct or indirect services. Direct services include programs that directly enhance exports and competitiveness (Genctürk, 2010). According to Hollensen (2007), direct services can be divided into financial support, information services, and export facilitating activities. Subsequently, Leonidou et al. (2011) added education and training-related programs as the fourth type of direct EAPs. Indirect services include support from the government that is not explicitly addressed to increase exports. Instead, they are provided to stimulate positive spillovers for the general export environment, such as innovation, research and development (R&D), and productivity assistance programs (Ribeiro & Forte, 2019). Xia, Milevoj, & Goncalves (2021) further summarized the classification and definition of EAPs.

The extant literature provides inconclusive evidence regarding the effectiveness of EAPs and their impact on SMEs. One stream demonstrates the positive effects of EAPs on firms and countries. A recent study using Spanish data indicates a positive and persistent impact of EAPs on participants' export and economic performance (Freixanet et al., 2021). It also demonstrates that, during a crisis like the global financial turmoil in 2008, firms using EAPs outperformed the control group and the national average in both export growth and survival rates. Alvarez (2004), Cull et al. (2017), and Broocks and Van Biesebroeck (2017) find a direct positive relationship between EAPs and increased exports. Others report that positive effects exist but are not directly related to increased exports. Sraha (2015) indicates that EAPs provide knowledge as a competitive advantage in implementing better marketing strategies. Jalali (2012) finds an indirect impact on strategy, knowledge, and commitment toward export activity. Leonidou et al. (2011) argue that the export-related resources, capabilities, and firms' export financial performance are positively affected by EAPs. Martincus and Carballo (2008) claim that EAPs are used mainly by small firms. Similarly, Freixanet (2012) finds that companies in the initial exporting stages benefit the most from EAPs. Firms that use EAPs have more significant participation in the private sector, are better adapted, and segmented (Seringhaus & Rosson, 1998).

In contrast, other studies show that EAPs are overwhelmingly perceived as bureaucratic, overly expensive, excessively time-consuming, insufficiently specific, and largely irrelevant (Rosenbaum, 2019). Kinnucan and Cai (2011) and Brewer (2009) argue that EAPs do not positively impact firms or countries. In some countries, the effects of EAPs are not sustainable (Cadot et al., 2015), and awareness and usage of EAPs are low (Ahmed et al., 2002; Kanda, Mejía-Dugand, & Hjelm, 2015). Furthermore, Crick (1997) finds that the more internationalized companies are, the less they perceive EAPs as useful.

Despite abundant literature, the extant research is mainly fragmented and shows contradictory results. Freixanet (2022) conducts a meta-analysis on EAPs showing a mixed picture, in which, out of 192 articles the author reviewed, 41 articles or 21% conclude that EAPs are clearly effective, 29 articles or 15% argue that EAPs are ineffective, and 106 articles or 55% find that EAPs' effectiveness depends on various contingencies.

In addition, numerous perspectives have been used to explain the export behaviours of firms, from the evolving Uppsala Model (Vahlne & Johanson, 2017) and Innovation Model (Bilkey & Tesar, 1977) to Born Globals (Cavusgil & Knight, 2015; Knight & Cavusgil, 1996) focusing on the phenomenon of early and rapid internationalization among young, entrepreneurial firms. For this study, we do not differentiate between various export behaviours and only distinguish between firms that have recorded international sales from those that have not.

Although the COVID-19 pandemic has disastrously impacted the global and local economies, it provides an opportunity to observe and compare firms' reactions, especially SMEs', regardless of their current stage of internationalization and various export behaviours, to EAPs during this global crisis. Meanwhile, in addition to existing EAPs, governments worldwide introduced new initiatives to assist businesses, especially SMEs, struggling to survive due to the negative impact of the pandemic. In the U.S., government assistance responses to the COVID-19 pandemic included various CEAPs, mainly two loan programs, which are PPP created by the Coronavirus Aid, Relief, and Economic Security (CARES) Act and EIDL, that was expanded and funded through the Coronavirus Preparedness and Response Supplemental Appropriations Act (NFIB Research Center, 2020). Scholars have started examining the impact of pandemic-specific CEAPs and how their support affects SMEs' survivability during this unprecedented global crisis (Dhewanto et al., 2020). However, the effectiveness of these CEAPs has yet to be examined thoroughly.

The extant literature also illustrates that SMEs tend to be less aware of EPPs, highlighting a need for external assistance or an intermediary, such as community banks, to improve communication with SMEs and prioritize their participation in the EAPs (Schembri et al., 2019).

Therefore, we developed four research questions to examine:

1. What were the impacts of COVID-19 on SMEs engaged in international trade?
2. How effective were various EAPs for SMEs engaged in international trade before and during the COVID-19 pandemic?
3. How did SMEs perceive and receive the COVID-19 pandemic-specific CEAPs?

What role did other stakeholders, such as community banks and related government agencies, play in affecting the awareness and effectiveness of EAPs and CEAPs?

A mixed-method approach was employed to answer these research questions. The majority of the prior research (87%) implemented a quantitative research method. Another 11% adopted qualitative analyses, and 2% used a mixed approach (Freixanet, 2022). We try to benefit from multiple information sources through a quantitative and qualitative analysis using primary and secondary data to generate research findings and draw conclusions.

3. Research Methods and Data Collection

3.1. Research Setting

This study, for data collection, purposely selected SMEs in California, where a significant number of firms engage in international trade. The main reason for us to plan our study this way was that the COVID-19 pandemic abruptly disrupted the agricultural supply chain in California and its key global markets. At the beginning of the pandemic, in January and February of 2020, California agricultural export values dropped between 0.8 percent and 1.5 percent. March 2020 export data showed a steeper decline of 3.5 percent. The downward trend in exports was consistent with increasing disruptions to the global food trade resulting from the pandemic. The average decrease in exports was approximately 2 percent, or around $700 million, from January to March 2020 (ERA Economics LLC, 2020). EAPs have been offered to California SMEs through the joint efforts of multiple government agencies before and during the pandemic to support the local export business. In addition, since April 2020, the newly introduced pandemic-specific CEAPs, such as PPP and EIDL, have delivered additional help during these challenging and unprecedented times, providing this study with a suitable source for primary data collection.

We used multiple approaches to collect primary data with a local focus on California to address the research questions. Survey data were collected online by reaching 1,401 firms in the region for quantitative analysis. Furthermore, nine semi-structured interviews were conducted with the local community bankers, SBA, International Trade Association (ITA), and U.S. Department of Commerce Export Assistance Center (USEAC) representatives. The information gathered from these interviews was analysed qualitatively to generate more meaningful findings and insights. In addition, we also benchmarked the primary data with the results from the Small Business Pulse Survey conducted by the U.S. Census Bureau during the same time.

3.2. Quantitative Approach

3.2.1. Sample and Data Collection

We conducted an online survey with California participants who subscribed to the U.S. Department of Commerce newsletter. The reason for using this group was that these SMEs either previously used some type of EAP or were interested in engaging in international trade. Their insights and comparison of the level of assistance received before and during COVID-19 would provide us with invaluable insights and assist us in answering our research questions. The informants were critical decision-makers for their respective SMEs. The responses were collected using Qualtrics from July through November 2020. Invitations to complete the survey were sent via email to 1,401 individuals. A total of 191 survey responses were received, providing a 14% response rate, which is in line with other studies in international business (Chidlow et al., 2015). After the responses were checked for completeness, 72 were used for the analysis.

3.2.2. Questionnaire and Measures

We developed the survey questions based on a literature review composed of a detailed classification of EAPs proposed by Ribeiro and Forte (2019) and the International Trade Centre Online Survey conducted at the beginning of the pandemic in the U.S. (International Trade Centre, 2020). The survey questions and structure were tested with export assistance professionals and SME executives for flow and clarity. The survey participants were asked to rank the effectiveness of various EAPs before and during the COVID-19 pandemic. Based on previous research, the EAPs are categorized into two main categories, direct and indirect services. The direct services are further broken down into export assistance programs, information services, export facilitating activities, and education and training with detailed subitems (Hollensen, 2007; Leonidou et al., 2011; Ribeiro & Forte, 2019). Participants were asked to rank the effectiveness of each identified EAP subitem before and during the COVID-19 pandemic using a five-point Likert scale. For Research Question One regarding the impact of the pandemic and Research Question Three regarding the effectiveness of CEAPs during the pandemic, we used the International Trade Centre Online Survey questionnaire as a reference to collect the related information.

3.2.3. Quantitative Analysis Method

To compare the effectiveness of various EAPs before and during the COVID-19 pandemic, we conducted multiple analyses, including descriptive analysis, correlations, and non-parametric tests, to analyze the survey responses before and during the pandemic. IBM SPSS Statistics 27 was used for quantitative analysis in this study.

3.3. Qualitative Approach

In addition to quantitative analysis, this study also adopted a qualitative method of exploratory and reflexive nature (Alvesson & Sköldberg, 2017) to generate a more profound understanding (Arber, 2006; Marschan-Piekkari & Welch, 2004). The qualitative analysis is descriptive and explicative in an attempt to understand better the processes and efforts of EAPs and CEAPs in response to the COVID-19 pandemic. SMEs and home country governments are primary stakeholders of trade promotion organizations, whose salience must be effectively leveraged to enhance international trade value creation and impact (Schembri et al., 2019). Descriptive as it attempts to identify and describe the main strategies adopted by SMEs and other stakeholders during the pandemic as they responded to the challenges brought by the pandemic, and explicative as it attempts to understand the process and opportunity areas in providing effective assistance to SMEs through EAPs and CEAPs during these unprecedented times.

This research adopted the method of in-depth, phenomenological interviewing (Seidman, 2006), focusing the analysis on language, data, and stories of the surveyed senior management at community banks and representatives from various government agencies, as ways of knowing and understanding the EAPs and CEAPs.

Since the pandemic restrictions were in place during the data collection portion of this study, all interviews were conducted virtually for about one hour each. The interviewees included six community bankers and three representatives from SBA, ITA, and USEAC. The interviews were based on a list of prepared questions, and the interview notes were then compiled for qualitative analysis.

4. Analysis and Findings

4.1. Survey Results

4.1.1. Descriptive Statistics

First, the survey results highlight the importance of international trade to SMEs in California. The responses indicate that 26 firms, or 36%, were exporting while 9, or 13%, were involved in importing. The remaining 45 companies, or 63%, were not involved in international trade. Of 27 firms engaged in international trade, ten or 37% belonged to the manufacturing sector. Another 7 or 26% were part of the agricultural industry, while the remaining ten respondents were divided equally between trade and service with 19% each. This distribution is indicative of the current situation in California, where manufacturing and agricultural-related industries play a vital role in the local economy.

Second, for the primary overseas markets targeted by SMEs in the survey, Canada and China/Hong Kong were the most significant individual markets, followed by Mexico, Japan/Korea, and European Union (E.U.). By area, East Asia was the largest export region with a 36% market share (represented by China/Hong Kong, Japan/Korea, and India). North America (Canada and Mexico) was the second with a 30% market share.

Almost all the responses we received, as shown in Table 1, were from SMEs with less than 500 employees and receipts greater than or equal to $1,000. Although SMEs engaged in international trade hired fewer employees (146 per firm on average), their annual sales (with a mean of $33 million) were much higher than their counterparts that are not engaged in international trade (average of 296 employees and $17 million sales per firm). Such a comparison echoes the U.S. Department of Commerce's statement that companies that trade internationally significantly outperform their peers. In terms of the sales mix, the SMEs engaged in international trade, on average, generated 34% of their total annual sales from international receivables. The contribution of the international receivables grew to more than half (53%) for the top quartile of SMEs engaged in international trade.

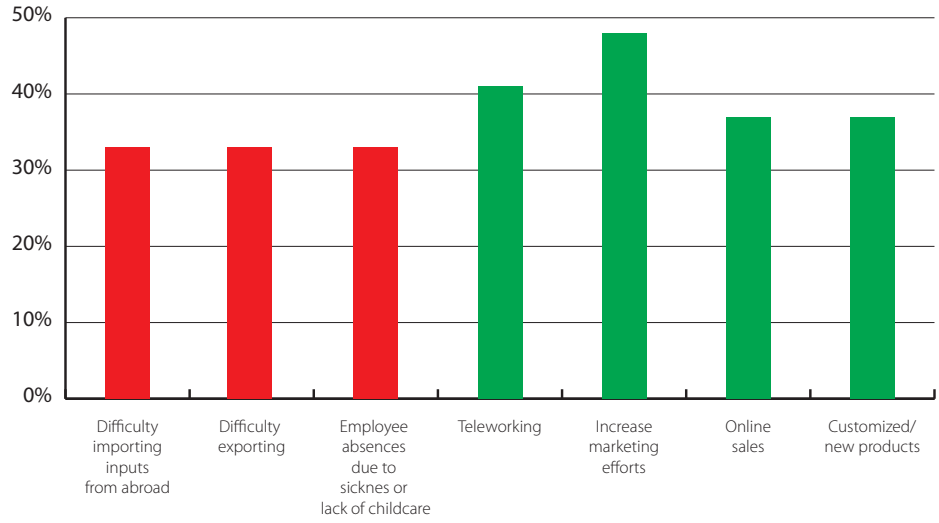
Table 1. Comparison between companies engaged and not engaged in international trade

	How many employees does your business currently have? Full-time equivalent		What are your total annual sales/ receipts in U.S. dollars (USD $)?		What percentage of your total annual sales comes from your international receivables (%)?
	International Trade Related	Non-international Trade Related	International Trade Related	Non-international Trade Related	International Trade Related
N Valid	26	38	26	40	26
Mean	146	296	33,055,081	16,737,429	33.9
Median	23	12	1,500,000	1,000,000	25.0
Std. Deviation	319	523	142,364,150	54,012,440	29.9
Percentiles 25	6	2	82,000	60,750	10.0
Percentiles 50	23	12	1,500,000	1,000,000	25.0
Percentiles 75	154	459	10,000,000	2,942,397	52.5

4.1.2. Research Question One

The survey results are shown in Figure 1 highlight the significant challenges SMEs engaged in international trade faced during the COVID-19 pandemic, including difficulties in importing inputs from abroad (33%), exporting (33%), and employee absences due to sickness or lack of available childcare (33%). The most widely adopted strategies to cope with the pandemic-related challenges were increasing marketing efforts (48%) and teleworking (41%), followed by online sales (37%) and customization and introduction of new products (37%).

Figure 1. Challenges SMEs engaged in international trade faced and strategies adopted during the COVID-19 pandemic



Using correlations with the Holm correction to adjust for multiple comparisons based on an alpha value of .05, we find a significant positive correlation between "How have your business operations been affected by the COVID-19 pandemic?" and "What percentage of your international trade receipts (sales) have been affected by the COVID-19?", with a correlation of .73, indicating a large effect size (p = .026). This suggests that the fluctuation of international trade receipts (sales) is one of the primary determinants of SMEs' perception of the pandemic's impact. No other significant correlations were found.

We compared our results against the Small Business Pulse Survey conducted by the U.S. Census Bureau in the middle of September 2020. We noticed that 33% of SMEs nationwide claimed a sizeable negative effect caused by the pandemic (U.S. Census Bureau, 2021). By comparing the responses indicated in Table 2 between SMEs engaged in international trade and their counterparts during the COVID-19 pandemic, our results show that SMEs not involved in international trade tended to be more strongly affected by the pandemic than those engaged in international trade (41% vs. 33%). SMEs engaged in international trade also tended to be more optimistic in anticipating when sales would return to normal. About 26% believed it would take less than three months compared to only 16% of those not involved in international trade. Nationwide, only 5% of SMEs felt the same way in the middle of September 2020 (U.S. Census Bureau, 2021), indicating that SMEs with access to the international markets might have more confidence in sales recovery than those focusing on domestic business only.

Table 2. Comparison between SMEs engaged and not engaged in international trade

		How have your business operations been affected by the COVID-19 pandemic?			
		Firms involved in international Business		Firms NOT involved in international Business	
		Frequency	Valid percent	Frequency	Valid percent
Valid	Not affected	2	7	4	9
	Slightly affected	8	30	13	30
	Moderately affected	8	30	9	20
	Strongly affected	9	33	18	41
Missing	System	0		1	
Total		27	100	45	100
		How soon do you anticipate that your international/domestic receipts (sales) will be back to the levels before the COVID-19?			
		Firms involved in international Business		Firms NOT involved in international Business	
		Frequency	Valid percent	Frequency	Valid percent
Valid	Within 1 month or less	3	11	4	9
	Within 1 to 3 months	4	15	3	7
	Within 3 to 6 months	3	11	10	22
	Within 6 to 12 months	5	19	10	22
	More than 12 months from now	4	15	6	13
	Not sure at this time	8	30	12	27
Total		27	100	45	100
		How easy is it to access information and benefits from government's (Federal/ State/Local) COVID-19 related small business assistance programs?			
		Firms involved in international Business		Firms NOT involved in international Business	
		Frequency	Valid percent	Frequency	Valid percent
Valid	Very easy	2	7	6	14
	Easy	3	11	10	23
	Standard	10	37	21	48
	Difficult	9	33	5	11
	Very difficult	3	11	2	5
Missing	System			1	
Total		27	100	45	100

In summary, from the survey results and analysis listed above, we can address our Research Question One regarding the impacts of COVID-19 on SMEs engaged in international trade as:

- While 98% of SMEs engaged in international trade acknowledged the impact of the pandemic, they were less strongly affected by the pandemic than their counterparts not involved in international trade and were also more optimistic about sales recovery.

- SMEs engaged in international trade also had a relatively similar degree of typical difficulties in importing, exporting, and employee absences and actively adopted strategies to cope with the challenges caused by the pandemic.
- The variation of international trade receipts (sales) closely affects SMEs' perception of the pandemic's impact.

4.1.3. Research Question Two

To explore Research Question Two, we divided EAPs into five categories in the survey, namely, financial support, information services, export facilitating activities, education and training-related programs, and indirect services (Ribeiro & Forte, 2019). Kendall's Coefficient of Concordance and Friedman Test Statistics were applied to compare the SMEs' responses. No significant differences among EAPs and detailed subitems under these five categories were detected, neither pre- nor during the COVID-19 pandemic. By pairing the responses of each subitem pre-and during the pandemic using the Wilcoxon Signed Ranks Test, six subitems were identified as less effective during the pandemic in the areas of financial support in terms of credit insurance and guarantees; information services, in terms of specific export opportunities, information on aggregate transactions, and procedures and means including customs clearance; export facilitating activities in terms of trade-related offices or embassies or consulates abroad, as well as education and training-related programs in terms of counseling advice on export business, as shown in Table 3.

Table 3. Comparison of EAPs before and during the COVID-19 pandemic

	Test statistic[a]					
	Financial Support	Information services			Export facilitating activities	Education and training-related programs
	Credit insurance and guarantees	Specific export opportunities	Information on aggregate transactions	Procedures and means, including customs clearance	Trade-related offices or embassies or consulates abroad	Counseling advice on export business
Z	-2.070[b]	-2.000[b]	-2.000[b]	-2.000[b]	-2.309[b]	-2.121[b]
Asymp. Sig. (2-tailed)	.038	.046	.046	.046	.021	.034

[a] Wilcoxon Signed Ranks Test
[b] Based on negative ranks.

Table 3 shows six subitems of EAPs were perceived to be less effective with statistical significance during the pandemic to address the research question regarding comparing EAPs' effectiveness before and during the COVID-19 pandemic.

As discussed in the literature review, increasing export activities is a goal of most modern governments, creating various services designed to promote and increase the

export profile of local SMEs. SMEs can gain customers, identify prospects, gather intelligence, and disseminate information through these programs, among other benefits. To effectively compete, SMEs involved in international trade rely on their ability to obtain valid foreign market information, training in export documentation, finding agents/distributors, and so on. The findings from California SMEs indicate that, besides exporting financial support, three information services subitems, one education and training subitem, and one export facilitating activity related to overseas marketing became less effective, partially due to the lockdown and travel restrictions, during the pandemic. We argue, however, that the U.S. government must ensure that exporters receive the assistance that helps them become more effective exporters, in addition to covering payroll through CEAPs during a crisis.

Consequently, public policy officials should focus more on improving the EAPs that exporters found less effective during the pandemic. The government must identify strategies to target these EAPs more effectively and efficiently. SMEs can also achieve better results by supplementing their resources and capabilities with government EAPs.

4.1.4. Research Question Three

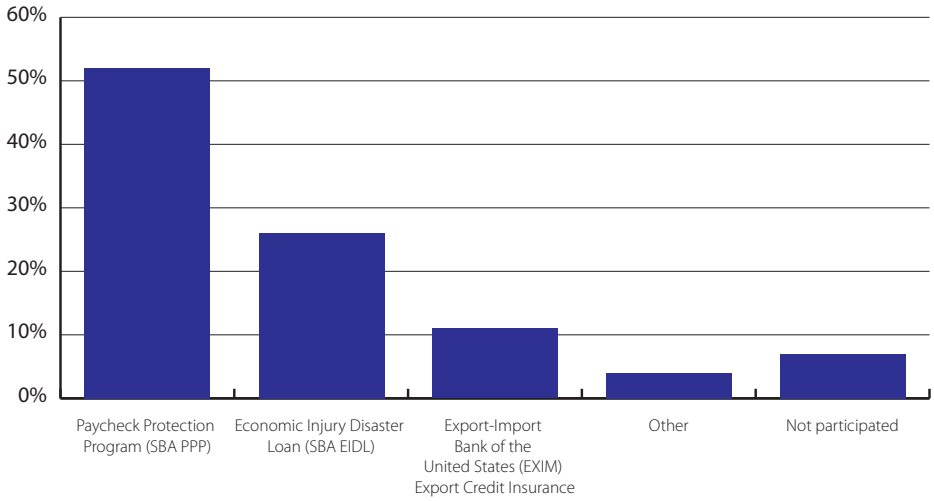
Figure 2 summarizes the response from SMEs engaged in international trade to various CEAPs serving as stimulus initiatives, especially PPP with a 52% participation rate and EIDL with 26%. The SBA administered both programs to provide timely support to SMEs during the pandemic. Meanwhile, Export Credit Insurance provided by EXIM also played a vital role in supporting 11% of SMEs during the pandemic. Another worth highlighting is that SMEs engaged in international trade were far more active in seeking CEAPs. Out of 45 SMEs not involved in international trade, the untabulated results show that only 38% received PPP, and 11% received EIDL. Both were much lower than their peers engaged in international trade. Meanwhile, comparing our results against the Small Business Pulse Survey conducted by the U.S. Census Bureau in the middle of September 2020, 73% of SMEs received PPP nationwide, and 22% received EIDL (U.S. Census Bureau, 2021).

The last part of Table 2 also reflects how easy it was for SMEs engaged in international trade to access information and benefit from the government's (Federal/State/Local) pandemic-related CEAPs. 18% of SMEs involved in international trade think it was "easy" or "very easy" to get CEAPs information, while 44% of them felt that it was "difficult" or "very difficult." Again, these results suggest that this is an opportunity to improve awareness and access to CEAPs.

Notably, although their participation rate in obtaining CEAPs was relatively low, SMEs not involved in international trade felt that it was relatively easy to access CEAPs information, with 37% stating that it was "easy" or "very easy" to get CEAPs information, while only 18% of SMEs engaged in international trade felt the same way. Furthermore, only 16% of SMEs not involved in international trade stated that it was "difficult" or "tough" to

obtain CEAP information compared to 44% of SMEs engaged in international trade. Such a discrepancy between the actual receipt of CEAPs and the easiness of accessing CEAPs information is worth further research.

Figure 2. CEAP & EAPs received by SMEs engaged in international trade



Contrary to our expectations, benchmarking against the national survey result, PPP was a less significant driver among eligible SMEs in California. Our finding related to the direct impact (or lack of) of PPP may be explained by considering the weak institutional context. Evidence suggests that, although the U.S. government supplied multiple CEAPs, SMEs experienced many challenges, including difficulties accessing such benefits from the banks, a high level of program bureaucracy, and a low level of research and development expenditure to make this process more streamlined for SMEs. Such challenges were argued to hinder SMEs' resilience and competitiveness in other government assistance programs (Islam et al., 2011), which may explain our finding concerning the not-so-impactful effect of PPP locally. Alternatively, such inconsistent results may be related to the extant literature that some SMEs benefited most from intangible resources rather than tangible/financial ones (Knight & Liesch, 2016).

Using correlations with the Holm correction to adjust for multiple comparisons based on an alpha value of .05, no significant correlations were found between firms' CEAPs participation rate, their characteristics, and their perception of the pandemic's impact.

To further understand the cause of such a significant gap, in our follow-up interviews, we discussed the process of CEAPs application and the possible challenges with local community banks and related government agencies to seek their insights. When asked about EAPs in collecting a firm's foreign receivables, 15% of SMEs would contact EXIM for

Export Credit Insurance, and 11% choose to seek assistance from the U.S. Commercial Service. Another 11% of respondents reached out to private-sector collection services, while 26% percent of SMEs selected to explore other resources. The results indicate that EXIM and its Export Credit Insurance were the most popular choice for SMEs engaged in international trade in California.

Therefore, for Research Question Three, we find evidence that SMEs engaged in international trade were more active in seeking CEAPs but had more challenges accessing the related information. Our research findings revealed a positive impact on SMEs involved in international business with relatively higher success in receiving CEAPs, particularly PPP and EIDL, than their counterparts locally to enhance the firm's ability to maintain operations and employment during the pandemic.

4.2 Semi-Structured Interview Results

4.2.1. Community banks and EAPs & CEAPs implementation

Our interviews showed that banks, especially community banks, played a critical and more active role in government stimulus initiatives and CEAPs such as PPP. The over $2 trillion U.S. stimulus package approved by the U.S. Senate in March 2020 encompassed a $367 billion reserve for SME assistance with fewer than 500 employees. In January 2021, the U.S. government rolled out a second PPP designed primarily to help large and small businesses keep employees on their payrolls. The U.S. government relied on banks to implement these initiatives.

The semi-structured interviews with these community bankers show that most of them invested a significant amount of time, including late nights and weekends, to understand how these new CEAPs, particularly PPPs, worked. They often had to educate their SME clients, who were mainly at a loss, on how to approach these programs and benefit from them.

During the COVID-19 pandemic, the community banks focused on PPP and did not venture into other EAPs designed to support SMEs' export activities. In April 2020, most community banks were overwhelmed with PPP applications, and their processing volumes were at total capacity. These banks had minimal resources to handle other types of government assistance programs. Also, several cases show that SME loans went to more prominent, higher-profile businesses than expected (Hinchberger, 2021).

Our interview notes also indicate many EAPs opportunities available for SMEs. The challenge, however, was that some of the programs might be too burdensome for community banks with limited resources and expertise to administer. For example, one of the interviewees said that international trade is like a "black box" for some smaller banks with limited expertise in international trade financing. The interviewee further stated: *"Smaller banks also don't know how to take advantage of available trade financing EAPs*

offered by various government agencies, which would help minimize their institutions' credit risk." This comment resonated even more in the context of our survey findings, which show that financial support in credit insurance assistance was not as highly rated as before the COVID-19 pandemic by SMEs (see Table 3). Meanwhile, on average, for SMEs engaged in international trade, 34% of annual sales were generated by international receivables (see Table 1). Given these results, it would be prudent for community banks to identify opportunities to support their SME clients participating in international trade and leverage the various government programs to help international trade finance.

Resulting from the U.S. government's efforts in streamlining CEAPs through the banks and supplying a road map for SMEs to access such assistance, a clutch of innovative technologies for community banks, in particular, seemed to have doubled down on these SMEs looking to build out a value proposition. Banks often tried to set up platforms to streamline and improve the application process, often overwhelmed by the sheer volume of funds and requests during the pandemic. This process was usually undertaken alone or with the help of fintech (Hinchberger, 2021), as the entire process took place digitally and over the internet. Such improvements could potentially be leveraged to better deploy current and future export financing programs.

In addition to EAPs and CEAPs, SMEs from the import/export sector have long relied on traditional loans typically obtained through conventional, if not antiquated, application procedures. Most of these companies still rely on community banks and credit unions for financing, but their applications repeatedly tend to be rejected because of poor credit ratings (Altin, Kizildag, & Bufquin, 2018; Han, Fraser, & Storey, 2009). Bankers, meanwhile, have frequently lacked reliable tools to predict creditworthiness among SMEs. As a possible solution, community banks need to be better equipped with digital applications to assist them in delivering such loan assistance to small business owners, similar to what they have done during crises such as the COVID-19 pandemic. Applications such as electronic notary, digital signature, and other workflow tools to handle the volumes community bankers were processing could become very helpful in streamlining future loan applications and monitoring them more efficiently. Such digital resources would allow community bankers to proactively earmark funds to SME applicants, including working capital loans and various EAPs financial support.

4.2.2. Community banks' role as the information hub

This study also found some significant impacts external events have on SMEs' ability to succeed in international trade. For instance, informational support positively affects SMEs' relational capital, affecting their export activities' performance. Informational support includes training, expert conferences, information sessions on target countries, and information resources on exporting. In this process, government actors must find the expertise, and correct information and share it with SMEs.

During the interviews, we learned about issues with the shortage of shipping containers and delays in the supply chain, which echoed the report *Economic Impacts of the COVID-19 Pandemic on California Agriculture* prepared by ERA Economics LLC (2020) and one of the findings from our survey indicating the challenges of importing inputs as well as shipping goods to other countries during the pandemic. Therefore, we recognize the opportunity of leveraging community bankers as the information hub to assist SMEs since they can collect, aggregate, and disseminate timely information from and to their clients in various sectors.

4.2.3. Synergy between community bankers and related government agencies

The interviews with SBA, ITA, and USEAC representatives indicated that the government agencies have been streamlining some of the application processes for supporting export financing. Since community bankers have become very familiar with various SBA loan products, the revised application form would also ask SMEs to indicate if they are engaged in international trade to provide adequate support and targeted assistance. One of the interviewees stated: "Most U.S. exporters prefer to be paid in advance (cash). With COVID, credit payments for foreign buyers could become more important. This would also allow U.S. SMEs to become more competitive with European and Asian firms." The results from a recent study suggest that SMEs that receive SBA loans did improve the four-year survival rate over the general population of small firms providing additional impetus for EAPs administrators to strengthen further their efforts in supporting SMEs engaged in international trade (Galli-Debicella, 2020).

Regarding education and training assistance available to SMEs interested in or already participating in international trade, in 2001, the General Accounting Office (GAO) recommended that the Trade Promotion Coordinating Committee (TPCC) eliminate duplication of export training services by determining the best way to combine the SBA and U.S. Department of Commerce export-training programs delivered by USEACs (Yager, 2001). Based on interviews conducted during this study, these efforts seem to have been thriving, given that some USEAC offices are now co-located with the SBA District Offices. Similarly, one of the interviewees suggested that community banks should create strong partnerships with SBA, ITA, EXIM, and USEAC to serve better their SME clients engaged in international trade.

4.2.4. Research Question Four

Therefore, for Research Question Four, the above findings indicate the critical role of community banks and related government agencies, especially their timely and valuable support to SMEs in CEAPs execution during the COVID-19 pandemic. Moreover, the findings from the interviews, particularly how local community banks prioritized their resources focusing on PPP and the related capacity bottlenecks, also help understand the

survey results related to our research questions, especially the possible cause of why SMEs engaged in international trade felt EAPs were less effective during the pandemic. The gap between SMEs received PPP and EIDL in California compared to the national average.

5. Discussion and Future Research

5.1. Discussion

According to the United Nations, the COVID-19 pandemic will be remembered as the most influential occurrence since World War II. Although the world may never be the same again, the pandemic provided challenges and opportunities. Small businesses employ almost 50% of workers in the U.S., yet, Bartik et al. (2020) research on the impact of COVID-19 on SMEs in the U.S. underscores the financial fragility of many of them. How deeply affected they have been by the pandemic. We found that the same is true for SME exporters in Central California. Several businesses were temporarily closed despite government assistance, and employment had fallen significantly, shocking U.S. SMEs, including exporters, like the Great Depression of the 1930s. Our results suggest that many of these firms had little cash on hand toward the pandemic's beginning, meaning they had to either cut expenses dramatically, take on additional debt, or declare bankruptcy.

The literature reviewed emphasized the importance of government export assistance programs (EAPs) and export promotion programs (EPPs) to enhance the export performance of small- and medium-sized enterprises (SMEs). However, we argue that the literature lacks sufficient depth in analysing how different EPPs sustain SME export performance. Its validity and reliability are impacted by the absence of an EPP portfolio that guides an efficient resource allocation for different EPP types. As Han and Park (2019) argued, EPPs work differently for distinct SMEs via the value chain informedness of SMEs for export performance.

In addition to financial support, EAPs offer information services and export facilitating activities to SMEs in the U.S., particularly in California. The literature review partly suggests that SMEs who accepted government EAPs benefited and continue to benefit from more promising export performance (Francis & Collins-Dodd, 2004; Wang et al., 2016; Ribeiro & Forte, 2019). The role of EPAs and EPPs is related to the resources devoted to SME exporters' international activity, but these are not fully determinant of their global performance. These firms tend to be more customer-oriented and reactive than any other sector (Malca, Peña-Vinces, & Acedo, 2020). Nevertheless, SMEs perceived some of these programs as less effective during the pandemic. However, strategic marketing implementation capabilities were still instrumental during the pandemic. For example,

support in marketing development capabilities could adjudicate information-related programs and export performance. Policymakers should, therefore, promote and develop EAPs with a more explicit focus on such initiatives besides financial support to help SMEs improve their export performance.

While some SMEs engaged in international business reported a negative impact caused by the pandemic in 2020, the U.S. government argued that CEAPs had some favourable outcomes in mitigating the adversities of many SMEs and made it less daunting. After all, the investigated SMEs benefited from these CEAPs to varying extents through the support of the community banks. Still, we would argue that the opportunity generated among the community bankers and SMEs had considerable importance for their long-term and mutually beneficial association.

SMEs represent the backbone of the U.S. economy, as they participate substantially in developing private initiatives, innovation, and employment. In the wake of the COVID-19 pandemic, SMEs engaged in international business were strongly affected by the demand and supply of products and services, tightening the ability to gather financial resources to meet short-term liquidity demands and working capital requirements. Discussing the role of multilateral development banks, Anton and Nucu (2020) emphasized the critical role these financial institutions play in providing sustainable resources to SMEs. In the U.S., community bankers will continue to play a similar role, arguably a more critical function, in the SME's post-pandemic strategies. These banks could redirect their assistance from liquidity to structural support, digitize business operations, and increase consumer demand.

Nevertheless, not all SME proprietors are acquainted with bank lending or export-related financial assistance. To facilitate this type of assistance program, and many others, should it ever be required in the future, banks ought to devise a pathway for SMEs to access EAPs and CEAPs when available. One possibility is for the U.S. government and community bankers to efficiently cooperate and communicate their intellectual and physical resources more widely. Such cooperation will require specifying best practice parameters for overseeing EAPs and dispersing funds through the banks to the SMEs.

5.2. Limitations and Future Research

This study has several limitations. First, our analysis was restricted to investigating a specific dimension of a small sampling of SMEs located in California, in the U.S., limiting the generalizability of the outcomes. There is an opportunity to examine further the effect of EAPs and CEAPs with larger sample sizes or in other geographic locations. Collecting data during the pandemic could also be viewed as one of the limitations since the survey respondents could have other pressing issues rather than responding to an online survey.

Secondly, our analysis was limited to exploring the effect of EAPs and newly introduced CEAPs, particularly PPPs, predominantly based on Xia, Milevoj, and Goncalves' (2021) findings. Evaluating the specific impact of comparable programs and policies in a future investigation could further contribute to theory and practice. Also, this study was restricted to investigating those incentive programs that were only derived from government institutions. In addition to government assistance, private institutions offer critical sources of financial support for export-oriented SMEs, as portrayed in our survey results. Still, opportunities exist for further research to explore the effectiveness of support measures stemming from private institutions, specifically from industry organizations and private financial institutions.

After the pandemic, as we are already witnessing, international trade in its various expressions will continue (Contractor, 2022). Some could incorporate export strategy and external forces and embark on a more exhaustive examination of the distinct EAPs and CEAPs programs to extend the present analysis to generate a more evolved and comprehensive framework with greater explanatory power. Incorporating other potentially essential attributes from the practitioner and academic perspective could also be beneficial.

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Recapturing Business Momentum in Accelerating Internationalisation for SMEs in the New Normal

Abstract. SMEs became enormous casualties when the COVID-19 pandemic changed the landscape and business environment due to massive containment measures imposed worldwide. While many SMEs have since closed, the remaining ones continue to struggle for business recovery. Nonetheless, dynamic and agile SMEs adapted better to the new normal. As the situation improves, SMEs should capitalise on renewed opportunities to raise their businesses to new heights. Drawing on the literature review, this chapter discusses the opportunity for SME internationalisation. It narrates the challenges faced by SMEs in the internationalisation process and the respective feasible solutions. More importantly, it recommends tactical and strategic measures to recapture business momentum in pushing their internationalisation agenda in the new normal. Lastly, SMEs need to embrace sound discipline in ensuring the effective execution of tactical and strategic plans to succeed in internationalisation.

Keywords: COVID-19 pandemic, Internationalisation, International competitiveness, New normal, SMEs, Tactical interventions

JEL classification: L20, L26, L78, M16

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Introduction

Business enterprises, particularly SMEs, were gravely impacted by the COVID-19 pandemic, more so for SMEs with international dealings. Cross-border activities were almost halted when various countries implemented containment measures to control the escala-

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tion of the disease worldwide. The closure of international borders and the suspension of business activities created a massive supply chain disruption worldwide. Conversely, the global economy was impacted by demand and supply shocks, disrupting all tiers of global supply chains and leading to sharp declines in international trade across a broad range of industries and products. World trade contracted by 7.6% in 2020 (World Trade Organization, 2021). However, the impact of the pandemic was unevenly distributed across sectors, with some, such as trade in agricultural products, continuing their growth while others, in particular services, were severely hit. In sum, international trade was severely disrupted. The pandemic shock has caused considerable damages and threats to businesses, including SMEs. In Malaysia, exports by SMEs declined significantly by 33.1% in 2020, on the back of an overall economic contraction of 5.6% (Department of Statistics Malaysia, 2021a). The deteriorated exports were attributed to the restrictions on economic activity resulting from the containment measures in response to the COVID-19 pandemic.

SMEs that remained operational in the past two years continue to face challenges as they recover from the pandemic ordeal. The recovery process can be challenging when resources, mainly financial and human capital, are depleted during the pandemic. As such, SMEs need more than a boost to kickstart the business recovery process. Meanwhile, the international market regains momentum as the economic condition improves, with more firms reviving their business operations. More international business transactions have begun to step up. This situation warrants SMEs a renewed business opportunity for internationalisation.

With more countries opening their borders, SMEs must realign their mindset and business approaches to recapture business momentum towards internationalisation. Much effort is needed to achieve success; SMEs must develop and implement tactical interventions and strategic measures to intensify their international competitiveness. They need to invest a great deal of effort to drive the business momentum in charging forward. This chapter aims to identify and evaluate the extent of the damages COVID-19 generated on SMEs, specifically those operating in Malaysia. This chapter will also discuss and recommend feasible tactical and strategic measures in assisting SMEs to regain their internationalisation competitiveness in the new normal. The chapter proceeds as follows: first, it draws upon the literature on SME impacts from the COVID-19 pandemic, specifically SMEs in Malaysia, with further deliberation on the practical measures undertaken by SMEs to maintain business continuity amid the pandemic and subsequent business recovery with the relaxation of containment measures imposed by the government. It then discusses the actions and approaches SMEs need to execute to strengthen and prepare themselves to tackle cross-border business activities post-COVID-19 pandemic. Consequently, the adoption of best practices is discussed for the benefit of SMEs.

Background

Business communities, particularly SMEs, have been severely impacted by the COVID-19 pandemic over the past two years. As expected, the resource-constrained SMEs and their internationalised counterparts suffered deeply due to the containment measures imposed in various countries worldwide. Likewise, the abrupt interruption of global economic activities, including that of the advanced countries in the European and American continents, paralysed the global economy initially as the early impacts were unexpected (Etemad, 2020). Many SMEs stopped operating, with most surviving ones still on the verge of recovery. SMEs that engage in international trades face added challenges due to global supply chain disruption resulting from the closedown of factories' worldwide. The adverse shipping and transportation conditions significantly slowed down the delivery of goods. By and large, the rising costs due to the demand and supply situation eventually landed with SMEs, making sales more difficult on inflationary effects. However, as the situation improves, internationalised SMEs could leverage new markets or international supply chains to enhance their productivity, profitability and employment (ILO, 2021).

In Malaysia, the situation has not been any better than the global scenario. The containment measures implemented by the government forced businesses, particularly SMEs, to scale down their business operations. The entire supply chain of SMEs was severely disrupted. SMEs' challenges include depleting financial, rising material costs and labour shortages, among others. The Small and Medium Enterprises Association of Malaysia (SAMENTA) estimated that at least 150,000 SMEs have shut down, resulting in 1.2 million job losses due to the pandemic (Chew, 2021). This figure represents 13% of the 1,151,339 SMEs in Malaysia in 2020 (Department of Statistics Malaysia, 2021b). In the light of the challenges, total losses suffered by SMEs were estimated at RM40.7 billion (US$9.73 billion) in 2020 as a result of a strict nationwide lockdown imposed by the government to tackle COVID-19, according to the Entrepreneur Development and Cooperatives Ministry (Medac) (Lee, 2021). Conversely, in 2020, total employment in SMEs shrunk by 0.9%, in contrast to that of non-SMEs, which grew by about 0.5%, resulting in a decline in overall employment in Malaysia by 0.2 percent. This resulted in a decline in the total share of SMEs' contribution to employment from 48.4% in 2019 to 48% in 2020 (Kuriakose & Tiew, 2022).

Despite the pandemic shock, SMEs that have survived the difficult period of the past two years stand a renewed chance of capturing new opportunities as they progress through business recovery. However, they need to realign themselves and regain the balance and fit within their resource system in preparation for the next growth phase. Besides the resurgence of the domestic market, the global market is set to grow profoundly when the pandemic impact mellows down in the new normal. To capitalise on the renewed opportunities for internationalisation, SMEs need to radically focus on pri-

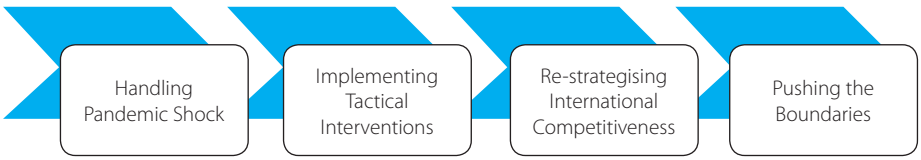
mary tactical interventions in getting their business performance back on track, enabling them to restore their business resilience. They need to rebuild their internal strengths to charge forward. With the immediate tactical measures in place, SMEs must rethink and re-strategise their business direction to strengthen their international competitiveness. SMEs can strive for sustainable business growth by establishing immediate measures and long-term strategies. In short, they must intensify their readiness to expand beyond the borders. To achieve this goal, SMEs must stay focused and recapture the momentum in driving their business forward. The internationalisation process is not as straightforward; hence SMEs must be fully committed and prepared to give their entirety in achieving success in the new normal.

This chapter aims to identify the sound and practical measures that SMEs can adopt to recover strongly from the COVID-19 pandemic, enabling them to recapture business momentum towards internationalisation in the new normal. This chapter will also illustrate the primary approach SMEs need to focus on when implementing tactical interventions and re-strategising international competitiveness. Lastly, SMEs must adopt good practices to effectively implement their business plans, allowing them to succeed in their pursuit of internationalisation.

Methodology

This chapter reviews issues that Malaysian SMEs faced as a result of the pandemic and discusses the opportunities for SME internationalisation with the aim to produce a comprehensive taxonomy of the current challenges faced by SMEs in the internationalisation process and some respective feasible solutions. Overall it is based on a literature review and involves a discussion of findings from secondary research. On this basis, best practice recommendations, including tactical and strategic measures to recapture business momentum in pushing SMEs' internationalisation agenda in the new normal, are presented. The chapter identifies fruitful directions for future work regarding SMEs in ensuring the effective execution of tactical and strategic plans to succeed in internationalisation. Figure 1 illustrates steps that SMEs need to take to pursue the internationalisation process in the new normal. These steps will be presented in the following sections.

Figure 1. SME Internationalisation Process in the New Normal



Pandemic Shock

In addition to lives and livelihood, businesses are gravely impacted by the COVID-19 pandemic. During the pandemic, SMEs were impacted more severely than large companies in the same sector, as their sales and cash flow shrunk significantly and more rapidly. Similarly, faster-growing SMEs that are more exposed to international trade disruptions also experience significant demand shock compared with SMEs that grow at a moderate pace (Adian et al., 2020).

SMEs in Malaysia were not spared from the consequences of the pandemic. SME contribution to the national GDP eased to 38.2% in 2020 (2019: 38.9%) with a value-added of RM512.8 billion (US$122.68 billion) from RM553.5 billion (US$132.42 billion) in 2019. Exports of SMEs dropped by 33.1% to RM117.8 billion (US$28.18 billion) in 2020 as compared to a growth of 2.6% in 2019, attributed to services (–62.1%) and manufacturing (–3.6%) sectors. Despite the drastic deterioration, the services and manufacturing sectors remained the main drivers of SMEs' GDP activities; both sectors represent more than 80% of SMEs' GDP (Department of Statistics Malaysia, 2021a). According to Che Omar, Ishak, and Jusoh (2020), the primary business challenges faced by SMEs during the restriction orders imposed by the Malaysian government were mainly related to operational and financial problems. The key factors impacting SMEs during the pandemic are discussed further below:

Financial Distress

The movement restrictions, resulting in a significant drop in business, caused many SMEs to face insolvencies, leading to financial distress and weakening of the overall financial position. SMEs that could not withstand the impact were forced to close their business operations. Based on cross-sector and cross-country detailed firm-level data, Gourinchas et al. (2022) reported SME failure rates to increase on average by 6.15% during the COVID-19 pandemic. They cited significant supply and demand shocks as the core reasons for weakened SME performances during the pandemic. SMEs also suffered a severe liquidity crisis, as well as having to face a resource crunch for covering fixed operating expenses such as rent and mortgage payments, utilities, and insurance (Zutshi et al., 2021). To remain relevant, many SMEs sought government support in subsidies, tax relief, and other financial and non-financial support.

As revealed in a survey on Malaysian SMEs (Department of Statistics Malaysia, 2020), over two-thirds (67.8%) of the respondents did not capture any sales during the complete-lockdown period. 42.5% reckoned that the business would take at least six months to recover from the pandemic. Another 28.7% believed it would take between 4 and 6 months. These findings reflect SMEs' deep entanglements in keeping their businesses

afloat and remaining relevant during this challenging period. Over two-thirds (68.9%) used their internal cash reserves to accommodate operating costs and working capital during the full lockdown period in funding the business. The rest survived an existing bank loan (19.8%) and fresh capital injection (11.3%) (Department of Statistics Malaysia, 2020). Separately, some 150,000 SMEs closed down their businesses amid the pandemic, resulting in 1.2 million job losses (Chew, 2021). The eroded financial position of the affected SMEs placed them in an unfavourable situation, creating a significant impact on their pursuit of recovering their business operations in the new normal. In sum, the pandemic severely impacted SMEs' financial performance in Malaysia due to work stoppage and laying off workers (Zutshi et al., 2021).

Supply Chain Disruption

The COVID-19 pandemic exposed the vulnerability and poor resilience of global supply chains. A large share of the present problem relates to the consequences of critical measures implemented by various countries without adequate consideration of the impact caused to global supply chains. Although the steps are essential, they could have led to market failures, causing low and delayed investment towards international economic development (Guan et al., 2020). Over time, many SMEs were indirectly affected by various public health measures implemented by the government. For instance, social distancing policies resulted in lower income and demand for SMEs products, with some even being unable to register any income (Lutfi et al., 2020). The global supply chain disruption significantly affected China, the European Union (EU) and the USA, responsible for 63% of world supply chain imports and 64% of supply chain exports (ITC, 2020). The global disruption of manufacturing inputs have cost the world an estimated US$126bn. Factory shutdowns in the EU caused significant repercussions for other countries' supply chain exports (ITC, 2020). The zero COVID strategies imposed to curb the spread of the pandemic in China have impacted the international environment and destabilised the global economic system by disrupting supply chains (Bogusz, 2022). Separately, the uneven trade flow between Asia, the USA and Europe led to a shortage of containers to ship goods between these continents. The imbalanced trade flow created a severe shortage of containers for intra-Asian trades and other trade routes (The Star, 2020b), leading to an escalated global shipping cost and delayed delivery of goods.

On the domestic front, Malaysian SMEs were also severely impacted by the global supply chain disruption. The closing of borders resulted in a massive delay in the shipment of goods, translating to increased operating costs for business. Consequently, shipping costs have skyrocketed due to massive dislocations in the container market, and warehouses are packed to the brim. A standard 40-foot equivalent container had reached a price of RM46,300 (US$11,077) to ship by September 2021, which is almost four times higher

than before the pandemic (Zainul, 2022). Compounding matters is a severe shortage of workers, creating a gap in the labour market. During the pandemic, many employees left their jobs either through staff retrenchments or resignations. As consumer demand is expected to increase going forward, this will add more pressure on the supply chains and potentially lead to more logistics delays. It will also increase the demand for labour, exaggerating negative implications on the labour shortage situation. Moreover, many foreign direct investments were deferred until the situation improved in the future. The overall supply disruption significantly impacts SMEs and will indirectly affect their long-term growth opportunities in the country.

Disoriented Business Environment

The sudden change in the business environment and dramatic change in the demand and supply of products and services worldwide due to the pandemic caught most businesses off-guard. The unsettled business environment significantly influenced the SMEs' business performance during the COVID-19 pandemic. If this business environment is not adequately anticipated, it can worsen business success (Yustian, 2021). Many SMEs need to prepare for unforeseen events. They must be responsive and consistent to remain relevant in an uncertain environment and continue to operate effectively in the new normal (Lengnick-Hall, Beck, & Lengnick-Hall, 2011). While most SMEs responded by protecting their businesses against threats and avoiding risk, the dynamic ones adapted promptly to the pandemic environment and improved their agility and productivity. They quickly realigned their business operating models to connect with the end consumers and maintain their liquidity. For instance, some SMEs resorted to e-commerce channels in reaching out to their customers during the movement control period. With the closure of physical stores, they refocused their resources on improving speed by reinforcing their e-commerce capabilities, resorting to online and direct-to-customer sales, and delivering food to customers confined in their homes.

Consequently, changes in the business environment also forced consumers to alter their buying behaviours. When this happens, rigid businesses that fail to change their business approach and model face the consequences of business failures in the worst-case scenario. Somehow, they will likely lose out to their competitors that are more adaptive to the changes. Moreover, consumers were forced to adjust their spending patterns due to a drastic drop in income. Many became jobless during the crisis when the overall economies were impacted. Those who remained employed were concerned about the future (Hu & Kee, 2021a). In sum, the COVID-19 pandemic has brought unexpected and dramatic changes to governments, businesses, and people in general. It has significantly affected and reduced the resilience of crucial socio-economic systems (Hu & Kee, 2021c). Malaysian SMEs listed the difficulty in predicting the future business direction as a pri-

mary consequence of the pandemic (Che Omar, Ishak, & Jusoh, 2020). For instance, the Malaysian SMEs involved in the furniture industry cited financial management and supply chain disruptions as the most significant challenges of the pandemic. Thus, the affected SMEs faced difficulties in paying wages, utilities and servicing of bank borrowing (Ratnasingam et al., 2020). SMEs are both concerned and uncertain about the future, which causes much grief. Many remain pessimistic and worried about business failure if the pandemic persists, resulting in an uncertain business environment in the future. Hence, for the meetings, incentives, conventions and exhibitions (MICE) sector, the Malaysian government has introduced various incentives and supports to industry players, including SMEs, enabling them to recommence their business activities in the new normal (Ho & Sia, 2020).

Human Capital Interference

In managing operating expenses during the pandemic, staff retrenchment and pay reduction were two common measures taken by most businesses. According to ILO (2021), the latest global estimates and country-level data indicate the unequal employment impact of the COVID-19 crisis in 2020 and the fragile and diverging recovery trends over the first half of 2021. The number of people employed and participating in the labour force has not fully recovered, and labour market slack remains significant in many countries. After some significant gains in the second half of 2020, the recovery in working hours stalled during 2021. During the third quarter of 2021, it is estimated that global hours worked were still 4.7% below the level of the fourth quarter of 2019, equivalent to the loss of 137 million full-time jobs. The first and second quarters of 2021 saw similar deficits in working hours (−4.5% and −4.8%, respectively).

In Malaysia, most of the businesses mentioned earlier are SMEs, making them most vulnerable to the crisis (Mottain, 2020). The unemployment rate in 2021 increased slightly by 0.1% to 4.6% as the battle against the pandemic continued. Against this background, the number of unemployed persons went up by 3.1% or equivalent to 22,000, raising the total number of unemployed persons to 733,000 (2020: 711,000) (Department of Statistics Malaysia, 2022). Furthermore, many SMEs were affected by workers with limited skills due to the lack of financial resources to improve their capabilities. Consequently, this led to high staff turnover that cost SMEs significantly through regular recruiting, hiring and offering higher salaries for new workers. In short, worker shortages have severely impacted SME performance during the pandemic (Ambad, Andrew & Amit, 2020).

In Malaysia, a simultaneous deterioration in domestic and external demand since early 2020 has invariably resulted in a jolt to SMEs and economic activities. The crisis has affected job sustainability, resulting in significant job loss. The unemployment rate in Malaysia peaked at 4.6% in 2020 (2019: 3.3%), resulting in 711,000 unemployed persons (2019: 508,200 unemployed persons) when the COVID-19 pandemic hit the country

(Department of Statistics Malaysia, 2021a). The unemployment rate stabilised at 4.5% in 2021 (687,600 unemployed persons). When SMEs revive their business activities, they face a labour shortage. Many have to pay extra to secure workers. Moreover, they lack experienced employees to stimulate business revival and growth. The shortcomings in human capital hurt business; if prolonged, it could delay the business recovery process.

The COVID-19 pandemic has created unprecedented challenges for SMEs, causing various business obstacles and, to a certain extent, business failures. Moving forward, SMEs must understand the implications of the primary issues affecting their business operations. With this, they will establish the right and effective measures to overcome the problems and moveforward with achieving their business goals.

Implementing Tactical Interventions

Building organisational resilience and ensuring sustainable improvement is essential for SMEs to handle challenging market conditions effectively, leverage changed situations, and identify new opportunities for business realignment and growth. Hence, it is crucial that SMEs survive the pandemic and seize opportunities in the new normal (Zuperkiene et al., 2021). Internationalisation is one of the critical opportunities SMEs can capitalise in lifting their businesses to new heights. However, the internationalisation process can be complex, thus requiring heightened efforts to succeed. Bose (2016) suggested that SMEs be innovative, possess the appropriate capacities, be supported by governmental policies, and get membership in critical business networks for proper internationalisation. Therefore, SMEs must develop the right capabilities to capture internationalisation, such as enhanced financial position, dynamic supply chain management, sound global networking, and good international skills.

Moreover, Sado (2014) reiterates that SMEs need to strengthen the core aspect of management through the proper implementation of tactical plans that are important in the day-to-day activities in enhancing their international competitive advantages. In short, SMEs must develop and implement sound tactical interventions to beef up their business operations after experiencing extended slow-down over the past two years. Effective tactical interventions will also help realign and drive SME businesses in the right business direction. SMEs need to work on the following tactical areas to bring their business up to speed and be prepared for international business growth in the new normal:

Leverage Government Assistance

Financial management is a critical business function that occurs at all stages of the movement of funds: formation, distribution and use. Based on a study conducted in Sweden,

the most common immediate actions taken by SMEs in protecting their financial position, irrespective of the anticipated negative long-term impact of the pandemic, were as follows: (1) deferred investments, (2) layoffs/government-funded work allowance, (3) reduced labour costs, (4) reduced expenses, (5) negotiated contracts and terms, and (6) reduced stock (Thorgren & Williams, 2020). Consequently, SMEs need to strengthen their financial backing before venturing abroad. They must set explicit allocations of funds for internationalisation (Hu, 2017). An adequate financial resource is essential to cushion any unforeseen incidental expenses due to market uncertainties.

Since the emergence of COVID-19, the Malaysian government has implemented eight economic stimulus packages amounting to RM530 billion (US$126.80 billion), representing 37% of the country's GDP in 2020. Some pertinent financial aids are loan moratoriums, wage subsidies, and various financing packages, particularly government guarantee schemes (Hu, 2021). Through its national budget for 2022, the Malaysian government has also allocated RM40 billion (US$9.57 billion) in various forms of financing, including equity injections, to drive business recovery. In addition, the government has provided RM22bil worth of guarantees, making it easier for SMEs to apply for new financing (The Star, 2022). SMEs should leverage government assistance that includes financial and non-financial areas to strengthen their financial position, enhancing their internationalisation readiness.

Realign Supply Chain Management

The global supply chain was massively disrupted during the COVID-19 pandemic, indicating the need to review the existing structure and model of the supply chain. The propositions regarding the contingency factors and their impact on the supply chain operating performance post-COVID-19 suggest that successful businesses, including SMEs, will focus on creating new operational performance and minimise risks. There is an urgent need to design more robust, resilient, and smart supply chains. Against this background, SMEs can adopt decentralisation of capacity, multi-sourcing, small-batch production, and digitisation to strengthen future supply chains (Fonseca, 2020). To go international, SMEs must improve the supply chain's resilience by selecting and dealing with solid suppliers, maintaining critical stock levels to handle possible delays in delivery, and investing in digitalisation to build a robust supply chain system.

According to Ahmedova (2015), redirecting a venture from low-value-added industries towards niche markets based upon particular competitive benefits and high-value-added productions may strengthen the SMEs to face global competition successfully. Moreover, they need to raise the level of customer engagement for effective customer retention. Furthermore, SMEs should work on contingency plans for alternative suppliers. This may include diversification and balancing of suppliers by geographies.

Prioritise Global Networking

Global networking is an integrated part of internationalisation for SMEs, helping them become more market-oriented to survive a highly competitive environment. Global networking can synergise the global supply chain when applying it effectively, benefiting internationalised SMEs. Gerschewski et al. (2020) found that the development of networks through trade shows increases firms' operational performance. In the new normal, SMEs can leverage digital platforms, such as Linkedin, to establish new international business contacts. Internationalised SMEs' knowledge acquired from trade shows equips them to create and foster business relationships with market players proactively. By doing so, they can also speed up global market reach and secure customer referrals, and short-circuit product time to market. Separately, networking with other successful SMEs inside or outside their home country is another mechanism that helps them overcome various liabilities. Networking increases the value of the existing means of SMEs and turns them into valuable resources (Read et al., 2009), hence enhancing their competitive advantages. Therefore, it would benefit SME managers to effectively utilise their existing network relationships in domestic and foreign markets by developing regular conversations with their associates. This will further develop their current resources and enable the information and knowledge necessary to achieve the firms' goals (Karami & Tang, 2019).

International performance of Malaysian SMEs is supported by their capabilities in respect to market intelligence, product innovation and pricing (Falahat et al., 2020). The Malaysian External Trade Development Corporation (Matrade), Malaysia's national trade promotion agency, provides a wide array of support to SMEs in achieving internationalisation. Notable supports include export development, promotion, trade advisory services, support, trade, and market information. Moving forward, SMEs can enhance their competitive advantage by leveraging governmental support to gain more comprehensive global networking. In the case of Malaysia, this would be, for example, the Strategic Programme to Empower the People and Economy (Pemerkasa) worth RM20 billion, which was announced on 17th March 2021. Hence, SMEs can utilise these financial incentives to expand their global market.

Sharpen Employee Skills

The human capital of key employees appears to be an essential determinant of internationalisation (Buzavaite & Korsakiene, 2019). More so when businesses are embarking on international trade in the new normal. The team deployed to handle international business must be adequately trained in global skills. Crucial global skills include cross-cultural communication capability, allowing them to communicate and negotiate effectively with foreign stakeholders. Employees who take charge of international business

must know foreign countries well, from demographic information to customer buying behaviours to working culture. Kim (2017) reiterates the importance of human capital in bringing SMEs to international platforms. Foreign language skills and international experience were also significant predictors of the firm's internationalisation. With such knowledge, SMEs will deal more smoothly with local stakeholders like suppliers, transportation companies, and the authorities. The staff force also needs to acquire excellent networking abilities. Being new to foreign countries, SMEs will benefit from guidance and information from the local community.

In addition to the above, skill development, particularly in high-tech sectors like robotics and artificial intelligence, is essential for Malaysian SMEs. By enhancing their skills, SMEs dealing with the electrical and electronics industry will benefit from improved competencies and workers' productivity (Ayamany, 2021). Thus, SMEs must develop proper plans to enhance employees' skills, such as sending them to relevant IT training either in-house or at training centres to improve their IT skills (Adam, Hassan & Abdullah, 2021). SMEs should capitalise on assistance provided by the Malaysian government in sharpening their employees' international skills. SMEs need to be proactive in reshaping their workers' relevant information technology (IT) skills and knowledge to adapt to the latest technology.

Implementing sound tactical interventions is crucial for SMEs, enabling them to exit the pandemic with adequate readiness and business momentum. Therefore, SMEs must remain focused and resourceful in establishing tactical interventions related to their resources and business direction towards internationalisation.

Restrategising international competitiveness

Having put in place the tactical inventions, SMEs must now work on strategic measures to enhance their internationalisation position. In short, SMEs must develop their business strategy with careful consideration of the internal and external environment. This well-thought process will help SMEs achieve their business goals more effectively and enhance their business performance (George, Walker & Monster, 2019). Consequently, SMEs must capitalise on emerging opportunities to expand the scope for international business activities. These strategic measures are essential for SMEs to reinforce and reposition their business towards internationalisation. To be successful, SMEs need to implement the following strategic plans:

Leverage Trade Blocs

Currently, various trade blocs are actively functioning worldwide. The influence of trade blocs on business strategy is diverse and significant. Formal trade blocs help normalise some policies, enabling easy access among the member countries. Moreover, a prioritised tariff over a selected list of products and services typically forms part of the incentives to encourage cross-investments. The other key attraction of trade blocs lies in the expanded population of all member countries. This allows member countries to engage with the entire population within the trade bloc (Hu & Kee, 2021b). One of Asia-Pacific's recently concluded trade blocs is the Regional Comprehensive Economic Partnership (RCEP). When it comes into force, this trade bloc, made up of 16 participating countries, will be the world's largest trade bloc. Against this background, SMEs can leverage the vast opportunities of RCEP to internationalise their business operations. They will also benefit from the trade liberation and globalisation process under the agreement.

As a member of RCEP, Malaysia will be placed in the global value chain, enabling Malaysian SMEs to reduce trade costs via streamlining the rules and regulations of making global trade. Furthermore, Malaysian SMEs gain access to a broader international market by harmonising technical standards and regulations and economic cooperation. SMEs can also gain skills and knowledge about conducting business across borders more formally. The demanding global environment will drive SMEs to upgrade their production methods, management practices, technologies, and skills. However, trade liberalisation also means that Malaysian SMEs have to work harder and smarter to compete with businesses within the region (Chong, 2021). Therefore, SMEs must plan carefully before capturing the opportunity of expanding their market reach through RCEP.

Localise Sourcing

A viable supply chain, as defined by Ivanov (2020), is a "dynamically adaptable and structurally changeable value-adding network" which is capable of agile reactions when changes are favourable but remains resilient in times of negative disruptions. Due to its ability to adjust capacities utilisations it ensures that markets and society at large have stable and long-term access to goods and services. As demonstrated during the pandemic, over-dependence on foreign suppliers can be risky when the global supply chain is broken. SMEs participating in local procurement value the role of opportunity competence in creating supply chain value, enabling entrepreneurs to involve new suppliers in supply chain activities, increasing flexibility, enhancing innovativeness, and supporting networked suppliers to develop new products and services. They can better manage this risk by diverting part of the sourcing from local suppliers. In short, local procurement can improve SMEs' overall supply chain performance (Kiwala, Olivier & Kintu, 2022).

Bearing in mind that if SMEs in foreign countries also adopt a similar strategy, Malaysian SMEs may face a renewed challenge in their internationalisation approach.

When the supply chain was disrupted during the pandemic, Malaysian SMEs highly dependent on imported parts or traded products faced acute shortages of supplies to fulfil their orders. As such, SMEs must diversify their sourcing to include local suppliers in their supply chain. By doing so, SMEs will be unaffected by uncertain supplies during a crisis and possibly more competitive material prices.

Intensify Innovation

Innovation, at its core is about solving problems, and there are as many ways to innovate as there are different types of problems to solve. Innovation, a tool to create a competitive advantage for SMEs, can bring a paradigm shift in any market. It can modify conventional practices or create a new and influential market. Conceptually, innovation can be applied to improve processes and create innovative outputs. Product innovation helps SMEs develop a broader range of products with improved quality, enabling them to expand their market reach.

Furthermore, SMEs can also improve their delivery system through process innovation. To be innovative, SMEs must possess the ability to continuously transform knowledge and ideas into new products, processes, and systems for the firm and its stakeholders. They must be ready to test new ideas, track down novel ways to do things, and possess creativity in the methods of operation. However, the innovation process can be complicated. Innovation involves various resources and multiple steps, often attracting substantial investment. Enhancing innovative ability is one of the most critical levers to increasing profitability and growth in SMEs. Innovation itself is a vast and multidisciplinary issue. Its various aspects are addressed by marketing, quality and operations management, technology management, organisational behaviour, product development, strategic management, and economics. As there is no standard recipe for the successful utilisation of innovation capability, SMEs need to find the correct dimensions of innovation capability based on their particular business needs in enhancing their business performances through innovation.

Ramdan et al. (2022) reiterate the importance of innovation culture in helping Malaysian SMEs improve their performance. In this context, SMEs in Malaysia should leverage various government assistance to accelerate innovation practices in the Malaysian context. The National Policy on Science, Technology, and Innovation 2021–2030 aims to catalyse Malaysia from a technology consumer to a technology producer and leapfrog to a high-tech nation. The development of technology will boost the quality of life, help the government realise its full economic potential, embrace sustainability, conserve nature and the environment, increase productivity and develop future-ready talents. Therefore,

businesses, including SMEs, must accelerate their capacity for innovation to remain competitive in a world on the cusp of super connectivity. In line with this strategic goal, SMEs can benefit from government assistance in driving innovation practices such as the Smart Automation Grant, SME Digitalisation Grant, the Digital Transformation Acceleration Programme, Industry 4.0 Incentives, the R&D Fund, and the Strategic Research Fund (Hu, 2022). Through innovation, SMEs can accelerate their business performances and elevate themselves to the next level.

Cultivate Talent

Upholding the principle of building an integrative model for small business growth, the most important resources include financial resources and human capital (Wiklund, Patzelt, & Shepherd, 2009). With adequate financial resources, SMEs can acquire other types of resources, allowing them to pursue their business goals. In terms of human capital, SMEs can enhance their workers' competencies and productivity by bringing out their best capabilities (ILO, 2021). Conversely, this would reduce worker turnover, which is unfavourable to SME growth. Knowing what to change and developing and executing action plans are critical in ensuring adequate progress towards organisational goals. Human capital and market intelligence are the significant determining factors here. Through thorough market analysis, SMEs can identify customers' needs and establish the correct pricing for their products and services. Employee engagement, employee welfare, and training and development — best practices in employee engagement — producing ideas on working together in facing the economic crisis. Heads of departments could co-create new products and systems with their workforce to help companies survive the new normal. Employee welfare must be prioritised in providing financial and psychological support to workers in trying times. Similarly, businesses must place greater emphasis on staff training and development in building resilience to face the future, and retain employees (The Star, 2020a).

About 69% of Malaysian respondents to PwC's Global Culture Survey 2021 (Malaysia Report) think their workplace culture has been a source of competitive advantage during the pandemic. Some 86% of them believe their organisation's culture must evolve in the next three years to grow, succeed and retain the best talent. About 80% of senior management employees feel a personal connection to their organisation's purpose compared to only 57% of those below and in middle management. Therefore, companies need to identify and focus on critical behaviours to help achieve their business objectives (Sidhu, 2021). Knowing what to change and developing and executing action plans is crucial in ensuring adequate progress towards organisational goals. Human capital and market intelligence are the significant determining factors here. Through thorough market analysis, SMEs can identify customers' needs and establish the correct pricing for their products and services (Hu, 2022).

Strategic measures in building and enhancing international competitiveness will be one of the primary determinants for sustainable internationalisation for SMEs. Therefore, SMEs must allocate adequate resources to implement strategic measures for their business successfully.

Pushing The Boundaries

Driving business momentum requires more than developing tactical and strategic measures. SMEs need to adapt and embrace sound discipline in ensuring the effective execution of whatever plans they have created. It is only through the proper implementation of strategies that SMEs can achieve sustainable international trade. In the pre-pandemic era, SMEs made decisions based on a resource-based and capabilities approach against the back of volatile economic environments. However, in the context of the pandemic crisis and the new normal, SMEs must incorporate market changes and uncertainties as one of the critical factors in the decision-making process. Given the rapid technological advancement and uncertain future, SMEs must re-strategise their business plans and efficient management practices to remain relevant. At the same time, SMEs need to enhance their capabilities, enabling them to achieve higher productivity and better performance (ILO, 2021). In this regard, SMEs must adopt the following disciplines in executing their tactical interventions and strategic measures:

Transformational Leadership

Transformational leaders forge a dynamic strategic culture in organisations by combining the creative insight, persistence, energy, intuition and sensitivity of their peers in developing performing organisations (Bass & Avolio, 1994). In simple terms, transformational leaders inculcate change in their followers and the organisations they lead. They raise their followers' motivational levels and morale, resulting in improved business performance. Transformational leaders also actively engage their peers to take on tasks more confidently. Being role models, they encourage their followers to optimise their strengths for results. Moreover, Dung and Giang (2021) found transformational leadership positively and significantly contributes to SMEs' export performance through employee strategic renewal behaviour and new business venture behaviour.

By adopting a transformational leadership style, SME owners are able to engage their team members more closely. Given the emotional costs of the pandemic, adopting transformational leadership is instrumental in engaging and motivating the team to work together towards rebuilding the business. A motivated team can improve productivity, hence lifting the business performance to a higher level. Being role models, SME own-

ers must win the trust, loyalty, and respect of the team members by walking the talk for business progression. In the new normal, team members need encouragement to cultivate authentic creativity and innovate in accelerating business recovery. They must be given the space and freedom to think outside the box, enabling them to establish new ideas and work on improved processes. Transformational leaders also serve as influential mentors to the team. They coach team members on knowledge and skills and reward them for work achievements. SME owners must be patient, enthusiastic, value learning, be approachable and supportive, and listen to feedback to be influential mentors. They must be willing to spend time engaging with the team.

Digital Transformation

Digitalisation, when mobilised effectively, can create significant economic growth for the business. It is becoming more critical in the post-pandemic period when business activities are experiencing more rapid growth. To be genuinely digitalised, SMEs must re-engineer and refresh their businesses by assessing and ensuring that their business strategies, business models, processes, and infrastructures are aligned and fully integrated to support their digital transformation. By executing digital transformation, SMEs can imagine and implement new approaches to optimise their performance in a fast-paced digital environment. SMEs can reap various benefits through digital transformation. Firstly, SMEs can better rationalise their operating cost through digitalisation in the long term. Although investments are incurred in the early stages of digitalisation, SMEs will see lower operating costs resulting from improved production efficiency and overall productivity. Secondly, the deployment of advanced technology enables complex tasks to be carried out more systematically and accurately, leading to enhanced product quality. This will lift the overall value of the business. Thirdly, technology deployment will also help streamline the production planning process, allowing accurate scheduling of orders in hands. Timely production will lead to prompt delivery of orders to the customers.

Despite its importance, the implementation of digital transformation can be complicated, particularly for SMEs that are resource-constraint. The following are some of the primary challenges often cited by SMEs when implementing industry 4.0 in business operations: (1) high investments in machinery, IT infrastructure, and technical training, (2) data security concerns, (3) small batch sizes, particularly for smart manufacturing (Müller, Buliga, & Voigt, 2018). Nevertheless, businesses, including SMEs, need to become digital to strike the right balance and integrate the digital, physical, and human world (Linz, 2020).

Embracing Sustainability

Climate change and sustainability will be part of all businesses in the future. Sustainability covers three primary principles: environmental, social, and governance (ESG) in the business context. These principles have gained remarkable attention over the last few years, particularly among large corporations. When applied diligently and collectively, ESG principles would lead to an improved global carbon footprint and a sustainable future. Moreover, the pandemic has shown that non-financial firms with higher ESG ratings achieved better profits during the COVID-19 crisis (Gregory, 2022). Therefore, SMEs need to instil greater values of ESG and start embracing ESG as part of their business recovery plans. However, it is easier said than done. Most SMEs do not take ESG principles seriously at this time. Many feel that ESG is meant for large corporations and businesses operating in advanced countries.

Taking a step forward, SMEs need to change their mindset and understand more about the ESG concept and its implication on business in the new normal. They need to improve their ESG disclosure, instilling confidence and trust among stakeholders towards sustainable development. SMEs that have already embarked on ESG principles may want to re-balance ESG emphasis and investment to give social issues a more significant share of attention in disclosure and strategy. Friede, Busch, and Bassen (2015) pointed out that a large majority of companies that adopt ESG principles in their business operations register better corporate financial performance. This reaffirms the benefits that SMEs can secure from the adoption of ESG principles.

Conclusions. Limitations And Future Research Directions

The COVID-19 pandemic has caused a severe impact on SMEs worldwide. While many SMEs shut down their business operations amid the pandemic, the surviving ones may capitalise on renewed business opportunities in the new normal. Internationalisation is one of the opportunities that SMEs can pursue in lifting their businesses to the next level. However, SMEs need to put in extra effort in realising their internationalisation agenda. They must develop and implement tactical interventions to overcome immediate challenges and put themselves on the track to business recovery. Consequently, they need to work on strategic measures to ensure the successful implementation of internationalisation in the long term. The findings of this chapter contribute directly to SMEs in their pursuit of internationalisation. They can help SMEs identify strategic imperatives that can strengthen their internal processes and control, enabling them to elevate their position to capture international opportunities more effectively. Academia will find the discussion useful for identifying new areas of research on SME internationalisation in the new

normal. Lastly, policymakers should revisit their existing policy and examine if some of the findings covered by this chapter can be implemented in their support instruments for SMEs that aim to expand internationally.

This chapter is written based on a literature review. Although it provides broad insights on SME internationalisation and practical recommendations in guiding SMEs to go global, it lacks quantitative findings to support some of the discussion and focuses on Malaysian SMEs. Therefore, future SME internationalisation research should involve quantitative studies that would verify the relative importance of the recommended solutions with regard to specific business sectors and countries. Such quantitative, cross-country studies should aim thus to verify and refine specific recommendations guiding the internationalisation of SMEs in the new normal.

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Blockchain Technology in Health Care — Lessons and Implications from the COVID-19 Pandemic

Abstract. The aim of this article is to investigate possible applications of blockchain technology in the fight against the pandemic, which, among other negative consequences, has disrupted global supply chains. Bottlenecks in the supply of raw materials and intermediary products for drug production had cascading effects in other areas, causing shortages in the supply of finished products. The author shows how blockchain-based smart contracts can help improve the functioning of the health service in general, how they can be used to optimize treatment methods and make social insurance more efficient. After reviewing the key features of blockchain technology and tracking the stages of its development, from the creation of the Bitcoin virtual currency to its use in smart contracts and other applications in combination with artificial intelligence in many spheres of the economy and social life, the presentation focuses on the use of blockchain in the management of medical records and its role in securing the stability of supplies of medicines and medical equipment.

Keywords: COVID-19, Blockchain, supply chains, smart contracts

JEL classification: I1,M1, O31, O32, O33

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1. Introduction

A blockchain is an advanced, new generation information technology in the form of a public distributed ledger, which can efficiently record encrypted transactions between two parties in a direct, verifiable and permanent manner (Iansiti, Lakhani, 2017; Ganne, 2018; Dash, Gantayat, & Das, 2021). Blockchain owes its existence to decades of research in the field of digital technology but it was not until 2008 that it actually became available, only to be used as the main component in the Bitcoin cryptocurrency a year later.

The second milestone in the history of blockchain took place in 2015, with the launch of Ethereum, a digital platform enabling the use of many decentralised applications in different areas, thanks to smart contract functionality.

Another important stage in the development of blockchain was the support given to Ethereum in 2016 by a decentralized autonomous organization (DAO), whose members could create smart contracts based on the Ethereum blockchain. DAO was designed as a venture capital fund in the crypto space (Das, 2019).

New distributed ledger technologies are being developed with an aim of improving the efficiency of Bitcoin and Ethereum networks and enabling new applications, meeting specific needs of particular areas of economic and non-economic activity, including health care, medicine, the pharmaceutical industry, culture, education, science and administration (Ganne, 2018).

The unexpected outbreak of the COVID-19 pandemic revealed the limited capacity of national health care systems to cope with emergency situations and showed their weaknesses. Traditional systems of registering infection cases, identifying high-risk patients, tracking the spread of the pandemic in real time proved ineffective. Various means of collecting and transmitting data turned out to be unreliable and incompatible, creating the risk of data loss or falsification as well as disinformation. Because most health care units resemble silos as regards patient data, the degree of interoperability between them is low, which impedes or delays the transfer of information, with an adverse effect on treatment effectiveness. Given imperfect methods of tracking the supply chain of medicines and medical equipment, counterfeit, low quality or overpriced products started to appear, as was often the case with COVID vaccines, ventilators, face masks and other medical supplies. As a result of the complex, time-consuming and quite expensive record keeping and transaction processing, doctors and nurses had less time and resources to look after their patients. The above-mentioned problems, as well as other issues faced by health care services, especially during the pandemic, can be largely solved by applying blockchain technology, as shown in this article.

2. Literature review

The COVID-19 pandemic has triggered a lively discussion about the causes of its global spread, preventive measures, its multifaceted effects and strategies of mitigating them. In a relatively short time, a large number of publications on these topics has appeared , mainly in international and national journals. A detailed overview of this discussion can be found in abstract and citation databases, such as Scopus, Google Scholar, Research Gate and Pub Media. Many authors concentrate on the possibility of exploiting inventions of the Fourth Industrial Revolution, also known as Industry 4.0, to combat the pandemic and possible future pandemics, since traditional methods and procedures used in health care systems proved to be unreliable. The key role among these new technologies is attributed to artificial intelligence (AI), the Internet of things (IoT) and next-generation mobile networks (e.g. 5G), big data analytics, automation and robotisation, augmented reality (AR), 3D printing and blockchain. These technologies are believed to improve the effectiveness of research on new generations of drugs (vaccines), ensure faster, cheaper, safer and qualitatively better production, transport, storage and distribution (Javaid et al., 2020; Vaishya et al., 2020;

Ting et al., 2020; Davenport, Kalakota, 2019; Coveri et al., 2020; Magableh, 2021; Rong et al., 2020; Gereffi, 2020; Shamman et al., 2021; Malik et al., 2021; Iiang et al., 2017).

The production of medicines, hygiene products and medical equipment will increasingly rely on AI-based cyber-physical machines tools, which will considerably limit human participation. As processes in the area of management, administration, office work, teaching and training become increasingly digitalised, more people can work remotely, which reduces the risk of the spread of a pandemic. The Internet of things, with access to large datasets and the use of AI can make facilitate the detection, monitoring and diagnosis of future pandemics. These inventions can be used to create virtual clinics offering remote medical consultations or medical chatbots capable of providing patients with constant medical care without them having to stay in hospital and freeing medical staff to look after more serious cases.

Global supply chains turned out to be a highly critical element in the fight against COVID-19. By offshoring the production of many intermediate goods necessary for the manufacture of medicines and medical equipment to countries with low labour costs, highly developed countries and emerging markets became dependent on goods supplied by these countries. The collapse in the production of these semi-finished goods in East Asia, mainly in China and India, created bottlenecks with cascading impacts across supply chains, ultimately causing declines in the supply of finished medical products all over the world. To prevent another crisis on such a scale should COVID-19 strike back again or in the case of any future pandemics, four main strategies are considered (Shao et al. 2021; Flach, Aichele, & Braml, 2020; Bunde, 2021; Schnelle, Schöpper, & Kersten, 2021; Lang, 2021):

a. reshoring or backshoring[1] or nearshoring[2] the production of products that are crucial for national security, including medical products;
b. diversifying (finding alternative) suppliers;
c. giving up on the use of just-in-time deliveries and increasing companies' storage capacities;
d. improving the process of managing supply chains by a greater reliance on digital technology.

It is in the implementation of the fourth strategy that blockchain can play a major role by making sure that the transfer of information is direct, transparent, efficient, safe, unchanged and verifiable and enabling smart medical and insurance contracts. These features of blockchain can help to make progress in detecting, diagnosing and preventing

[1] bringing domestic manufacturing back to a given country
[2] moving manufacturing to a neighbouring country

pandemics (Opportunites, 2020; Sharma et al. 2020; Marbouh et al. 2020; Nguyen et al., 2020; Degnarain, 2020; Du et al. 2021; Schnitzbauer, 2021; Bansal, 2021).

3. Research method

The theoretical article is based on results of desk research and the author's own predictions. A wide body of literature was reviewed as well as Internet sources about the impact of Industry 4.0 on the progress in medicine in the context of COVID-19, and, more specifically, about medical applications of blockchain technology. The author argues that this technology can bring potential benefits in the field of medicine and health insurance, particularly with regard to combating future pandemics COVID-19.

The main body of the article consists of five sections. In section 4, the author presents the key features and types of blockchain. It is followed by an overview of the main stages of its development (section 5), from the creation of the virtual Bitcoin cryptocurrency, through the launch of the Ethereum platform, which enabled users to create decentralized applications and register, confirm and transfer encrypted, peer-to-peer (P2P) transactions and ownerships, including those in the field of medicine and health insurance, in the form of smart contracts, to the present stage, known as Blockchain 3.0, where digital applications are combined with AI, IoT and other Industry 4.0 inventions. Section 6 contains examples of the exceptional usefulness of blockchain for registering, storing, sharing, analysing and evaluating information about the course of COVID-19 and possible future pandemics. Section 7 shows how this technology can be used to manage medical supply chains by providing tools that increase their transparency, security, velocity and reliability. The eighth section is devoted to the importance of smart contracts in medicine and health insurance. The author argues that they will prove useful in optimising treatments based on telemedicine and personalised therapies as well as insurance procedures.

4. Features and principles of blockchain

There are five basic principles governing blockchain, which distinguish it from other information systems and make it superior to them (Dhillon, Metcalf, & Hooper, 2018; Szpringer, 2019):

- **Reliance on a distributed database** means that resources are not located in one place but each node (computer) has full access to it, which is independent of others, i.e. it has a complete replica of the database. This blockchain ledger is not controlled by anyone and each participant can verify the record of transactions;

- **Information is transferred from peer to peer**, without passing through a central node. Each node stores and transfers data to all other nodes;
- **Transparency is combined with encryption (pseudonymisation).** All transactions are visible to any participant. Each participant has a unique address, usually consisting of 26–35 alphanumeric characters. Transactions take place between these addresses;
- **The record of transactions is immutable.** Once a transaction is recorded in the ledger and user accounts have been updated, the information cannot be altered. It becomes another block of the chain, which is linked with the preceding ones and contains its unique hash together with the hash of the block before it. Different algorithms are used to protect the integrity of transactions, their chronology and availability to all network participants;
- **Computational logic.** Since the ledger is digital, blockchain transactions can be tied to computational logic and programmed using algorithms and rules to automate the transaction process.

There are many types of blockchain, which differ in terms of their degree of decentralisation, the level of accessibility, the kind of consensus between blockchain parties, scalability, transaction speed, transaction fees, energy use, etc. (Ganne, 2018; Piech, 2016).

5. Stages in the development of blockchain

The first stage in the development of blockchain, described as Blockchain 1.0, was connected with the creation of a virtual currency called Bitcoin in the form of a special code consisting of several dozens of characters. The code is created in the process called mining, during which the miner's computer has to solve a complicated cryptographic task, known as the proof of work. After special software has been installed on the miner's computer, the task involves solving a certain inequality using a Secure Hash Algorithm, known as SHA-256. The solution is found by the trial-and-error method (Piotrowska, 2018; Ross, 2017; Dhillon, Metcalf, & Hooper, 2018), and is equivalent to the creation of a new block.

The next stage in the development of the digital ledger technology, known as Blockchain 2.0, was characterised by the possibility of registering, confirming and forwarding encrypted, P2P transactions and ownerships (Swan, 2015; Appendix B, 2014). The technology could be applied in finance, health care, insurance, administration, science, politics, etc. All these possibilities were made possible by the creation of Ethereum, a decentralized blockchain platform conceived by programmer Vitalik Buterin and launched in 2015 (Szpringer, 2019; Czajkowski, 2021; Czym jest Ethereum, 2018). The platform has its own cryptocurrency, called Ether, which is mined, as in the case of Bitcoin, by solving

cryptographic problems through a proof-of-work system. While Bitcoin is used for payments, applications of Ethereum are much wider, enabling users, as already mentioned, to create and run decentralised applications and smart contracts.

Smart contracts can be defined as "programmes stored on a blockchain that run when predetermined conditions are met" (IBM, n.d.). Thanks to the development of blockchain, smart contracts are becoming increasingly complex, autonomous, and widely used. Smart contracts enable the creation of decentralized applications (DApp), decentralized autonomous organisations (DAO), also known as decentralized autonomous corporations (DAC) and decentralized autonomous societies (DAS) (Decentralized, 2019; Swan, 2015; Bashir, 2018; Kosior, 2019; Kropopek, 2019; Wiktor, 2020; Czym są, 2020).

A decentralized application is a type of distributed software application that operates on a peer-to-peer blockchain network and relies on smart contracts. A decentralized autonomous organization can be regarded as a more advanced form of decentralized applications. By purchasing tokens issued by a DAO, a party becomes one of its investors. The organisation is controlled by a computer programme, which stores encoded rules of how it should be managed and its business logic. After launching the programme, a DAO operates autonomously, making independent business decisions and taking appropriate actions by exploiting its AI functionality.

Sets of smart contracts or entire autonomous ecosystems can be used to perform many functions that are normally carried out by health care institutions, e.g. to issue, sign and transfer prescriptions or documentation regarding treatments, insurance, records of patients and payments for health services, to enable autonomous management of health care centres. When the range of services provided by means of smart contracts constitutes a considerable percentage of all services, one can talk about a decentralized autonomous society, which is still a long way off.

While Blockchain 2.0 is already being implemented to various degrees depending on company, industry and country, Blockchain 3.0 is a nascent technology, enabling digital applications combined with artificial intelligence, which go far beyond the economic sphere. They can be used in health care and medicine, the pharmaceutical industry, the insurance sector, government and administration, science, education, culture and art. It can be described as an improved version of Blockchain 2.0, without the following shortcomings (Swan, 2015; Ackermann, 2016; Colomo-Palacios, Sanchez-Gordon, & Arias-Aranda, 2020; Terzi et al. 2019):

1. poor scalability. Blockchain 1.0 was capable of processing 7 TPS[3]; with Ethereum, this figure increased to 15 TPS, which is still incomparably less than the average transaction speed of Visa, which is 2000 TPS (What is, 2019);

[3] transactions per second

2. limited interoperability between different blockchain systems and other cloud resources for data storage and analysis;
3. huge energy consumption required by computationally intensive algorithms used as proof of work or complex privacy protection schemes;
4. the difficulty of increasing the level of privacy and intellectual property protection without limiting accessibility the complication of the blockchain system;
5. not enough protection against cyberattacks;
6. the need to decrease the costs of participating in the system and improve transaction efficiency

Many attempts are made to solve these problems. One of the most promising solutions is the use of directed acyclic graphs (DAG) in the underlying structure of distributed ledger technology (DLT), (Consensus, 2021; Joshi, 2019; Beebeejaun, 2019; Czym jest skierowany, 2020; Lee, 2018). In DAG-based blockchain architectures, individual transactions are not added to the network in a chain but as multiple paths forming a tree-like structure. Consequently, a DAG-based blockchain is faster and more efficient compared with conventional blockchain technology. There are no miners or blocks in this framework and new transactions added to the network are based on previous ones, which are used to verify them. Thanks to this approach, the infrastructure required to verify transactions can be considerably scaled down, which results in shorter transaction approval times and reduces transaction fees to almost zero. Transactions are made nearly in real time, which solves the problem of scalability. A DAG-based DLT is capable of handling 10.000 TPS and it is believed that this speed can even be exceeded with a much lower energy consumption.

6. Using blockchain for medical record management

The main application of blockchain during COVID-19, and more generally, in health care consists in improving medical record management (Kuo, Kim, & Ohno-Machado, 2017; Kumar et al., 2018; Vazirani et al. 2019; Pakdemirli et al., 2021; Attaran, 2020; Marbouh et al., 2020; Azim et al., 2020; Bhat, 2020; Haleem et al., 2021). Currently, medical record systems, largely based on manual record keeping, are very labour-intensive and inefficient. Studies indicate that despite high costs they generate, most doctors do not receive enough data or receive them with delays. It is estimated that every year over 300,000 patients die globally as a result of errors in medical records. The wide scale of data collection and transmission between different health care units involved in the treatment of patients has also been one of the key challenges in the fight against COVID-19. An effective response to any pandemic requires reliable information about its symptoms, scale and development in

different countries, treatment methods and preventive measures used and their effectiveness. Blockchain technology can serve as a useful tool for registering, storing, sharing, exchanging, analysing and evaluating information about the course of the pandemic at the global, national, regional and individual level. Until now, patients' medical records are kept in different places of the health care system: by doctors in private practice and general practitioners, by hospitals, health care centres, laboratories, insurance companies, in different locations and sometimes even different countries. Different kinds of software are used to collect and manage medical data, which in addition to compatibility issues may make it difficult to establish the order in which records were created. Since patients' medical records are scattered in different places, information is often transferred with delays and its authenticity cannot be easily verified. As a result, a doctor seeing a patient in a hospital may not have a complete and reliable record of his or her disease. In serious cases, when urgent intervention is required, time is a key factor in the patient's recovery.

In the case of a pandemic, blockchain technology can be used to collect general and individual information in one place in the form of blocks, which can be quickly and easily forwarded between parties involved in treating a given patient. This saves time and costs normally incurred to transfer data between different locations, obviates the need to repeat medical tests and provides better security compared to e-mail. Thanks to a high degree of interoperability, treatments can be highly personalised, because there is just one point of access to all patient's data in real time. The system ensures a high level of data accuracy and transparency, making it impossible for a doctor or a patient to remove or alter them. Data are authorised by their source of origin, so that their legality and quality can be verified. The security of data transmission and their confidentiality is better protected because data are recorded by encryption algorithms and registered by distributed networks, without the mediation of a central institution, which could be hacked much more easily than a large number of nodes in a given private blockchain network. The patient and authorised entities can easily access the medical record system, which is much cheaper to maintain in comparison with those based on conventional methods. Being able to access secure, reliable and comprehensive database containing health records, doctors run a much smaller risk of misdiagnosing their patients, can offer more effective treatments, and consequently, decrease the number of deaths, especially during a pandemic.

7. Using blockchain to manage medical supply chains

Blockchain can and is already beginning to play an important role in managing the medical supply chain (Opportunities, 2020; Sharma et al., 2020; Marbouh et al., 2020; Nguyen et al., 2020; Betti, Hong, 2020; Degnarain, 2020). Its advantages are particularly evident in the context of the difficulties experienced by global supply chains during COVID-19.

As a result of movement restrictions, social distance requirements and limits for indoor gatherings, many companies had to close their operations or limit production. At the same time, there was a sudden rise in the demand for medical supplies, such as face masks, gloves, ventilators, hygiene products and disinfectants, and, later on, COVID-19 vaccines. Faced with the prospect of possible shortages, consumers started stocking up on medical products and food, which made it difficult to maintain continuous and sufficient supply of goods. It became much more likely that urgently needed medicines would not be delivered on time or at all, or that the amount actually delivered would be of poor quality or counterfeit. Pharmaceutical companies lose an estimated $200 billion in revenue as a result of counterfeit prescription medications (Arsene, 2020). Forced to rely on new, unverified suppliers of medical equipment or medications and having to deal with cases of contract terms being broken, business owners were more likely to charge higher prices and demand advance payments. One such case made headlines in Poland, after the government had ordered ventilators from an arms dealer, had paid for them in advance but did not receive either the equipment or the money.

It is precisely these kinds of problems that blockchain technology is capable of preventing. By improving communication and eliminating intermediaries, a blockchain system makes it possible to match supply to demand in terms of quantity, quality and time of delivery. Because a blockchain-based supply chain is transparent, the flow of medications from the producer to the consumer can be easily tracked. This is particularly important in the case of long, cross-border supply chains, where the large number of stakeholders makes verification difficult and increases the risk of a failed delivery. Using blockchain, recipients can make good choices by checking if products are good quality, whether suppliers are reliable and what procedures they use. They can verify the origin and authenticity of medications, thus avoiding the risk of purchasing a counterfeit, low quality or potentially harmful product.

An effective response to any future pandemic requires a global consensus on how the supply chain of vaccines should be managed. Any such system should be transparent, verifiable, secure, timely, inexpensive and easy to implement. It should enable real time tracking of the flow of vaccines from the producer to end consumers and should provide effective means of communication and feedback between them. All these requirements are met by blockchain technology, although its effective and wide-scale implementation requires education, IT expertise, appropriate national regulations and uniform international norms and standards.

8. The role of smart contracts in medicine and health insurance

In the health care sector a number of contracts are concluded between different stakeholders, such as patients, hospitals, suppliers of medical services, pharmaceutical companies, medical laboratories, medical and insurance organisations as well as universities and clinics. Traditional contract procedures are labour-intensive and time-consuming, not very secure and expensive. Various health care institutions rely on different software to collect information, manage medical records and conclude contracts. These inconveniences can be overcome by employing smart contracts on blockchain, which are automatically executed when conditions predetermined in an algorithm are met, thus enabling access to health care and improving its effectiveness (Du et al., 2021; Thompson, 2019; Schnitzbauer, 2021). Smart contracts are used to store agreements in a digital ledger. If a patient moves from one medical unit to another or receives treatments at various units, doctors working in these different units can, with the patient's consent, immediately access their complete medical records and administer treatments according to conditions set out in smart contracts. Changes in agreements in the form of entries approved by all parties concerned are added to consecutive blocks of data in a chain. The system guarantees that data sources are authentic and identities of patients and medical staff can be verified. Records of the latest diagnosis and their previous corrections stored in the contract block enable the hospital to choose the most qualified staff and treatment method for a given patient.

Smart contracts are used to optimise treatments in telemedicine and personalised therapies. Sensors connected to patients communicate with smart wearables and use the Internet to send information about their health, which is recorded in the form of smart contracts on blockchain. Smart contracts can notify doctors about their patients' health status, enabling them, if necessary, to make a medical intervention in real time. Based on these data, the doctor sends a diagnosis to the patient, administers a particular course of treatment and decides if the patient needs to be hospitalised. All these data are recorded in the system of smart contracts, which can also be used to conduct community health programmes based on health data of a given population, such as preventive measures against an epidemic, or mass vaccination programmes. The system reduces costs of communication between doctors and patients and other medical specialists, facilitates diagnosis and the choice of medications and accelerates the decision making process, all of which improve treatment effectiveness. With this system, each patient is really treated individually and there are no cases of misplaced or duplicated records, which are not so infrequent in traditional health care systems.

Health insurance is another area where smart contracts can eliminate existing inefficiencies. For one thing, all details of an insurance policy are automatically recorded and securely stored in a distributed ledger, which is much less prone to cyberattacks than a tra-

ditional database. There is no need for patients to fill in long and complicated claim forms before undergoing a treatment, because a smart contract will automatically file a claim if certain conditions are met. A decision to transfer money from the insurer's bank account to the hospital's account will also be triggered automatically. This guarantees that payments are made correctly and minimises the likelihood of insurance fraud and legal disputes. By reducing bureaucracy, an insurance transaction is simplified and takes less time.

9. Conclusions and recommendations

There is no doubt that blockchain is a breakthrough digital technology, which is very likely to gain importance, not only in financial applications but also in other domains, such as health care and health insurance. Its main feature and benefit for society is the elimination of intermediaries by enabling P2P transactions, which are recorded, combined, encrypted, validated and updated in a distributed database in a secure manner that does not depend on the amount of trust between transaction parties. Blockchain enables automatic transactions executed by means of smart contracts. Thanks to these features, the technology can be used to considerably decrease costs and the amount of administrative in health care. This is particularly relevant when health care systems in many countries suffer from underinvestment or bad debts due to uncompensated care, and from a shortage of doctors and nurses. These and other problems, which became particularly evident during the COVID-19 pandemic, can be resolved or mitigated by applying blockchain technology. Although it was invented barely several years ago, it is already undergoing a third stage of development (Blockchain 3.0) in an effort to eliminate the shortcomings of the previous system connected with scalability, speed, complexity, high energy use and transaction fees. Moreover, Blockchain 3.0 is paving the way for the implementation of AI, which is already utilised in smart contracts on Ethereum.

New technologies, especially those associated with breakthrough innovations, are not embraced without a certain amount of resistance resulting from a number of technical, economic, social, psychological and educational hurdles that stand in the way. History shows that all these hurdles are eventually overcome because innovators and their sponsors think in terms of profit and loss. They are confident that after resolving objective and subjective problems standing in the way of a new technology, profits will outweigh losses. Ultimately, it is a matter of how to be more competitive. This is what motivates companies to spend millions in R&D, as this is a *sine qua non* of survival and growth, enabling them to retain or increase their market share and improve profitability. Competition also takes place between countries, with governments pursuing different policies to support innovation. This phenomenon is best exemplified by developed countries such as the USA, Japan, UK, Germany, France, South Korea and China, which is becoming the second

biggest player in the field of applications involving new digital technologies and AI, after the USA. In the years to come one can expect not only new digital, AI-based businesses but also entire ecosystems of such companies, perhaps on a global scale. All these issues should become the subject of future research, with emphasis on various applications of Industry 4.0 solutions in medicine and health insurance. More research is required on ways of combining blockchain with AI, IoT and other innovative technologies, which will possibly lead to revolutionary changes in how they are used. Results of this research should be of interest not only to health care institutions and companies in this sector but also to governments and international organisations and centres of IT education. However, the processes described in this article cannot be implemented without a supportive regulatory framework, financial backing and appropriate education.

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The Impact of COVID-19 on Selected Hungarian Industries — Close Observation

Abstract. On 11 March 2020 the World Health Organization declared COVID-19 as a pandemic. Countries around the world adopted risk-mitigating measures such as lockdown, quarantine, and curfew. Lockdown is an uncommon risk-mitigating measure applied to prevent the spread of the pandemic. There have been diverse views on its effects on the economy. However, it is indisputable that the COVID-19 pandemic imposed an additional burden on industries in the economies of individual countries. The main aim of the study was to assess the impact of the COVID-19 pandemic on selected industries in Hungary. Regression discontinuity design (RDD) was applied to determine the partial impact of the COVID-19 pandemic on selected industries and investigate the effects of COVID-19 around its thresholds at a significant time and stage of the pandemic. The study revealed that COVID-19 negatively affected at least the industrial production of motor vehicles and non-durable goods. The industrial production of durable goods, raw steel, as well as total manufacturing were resilient to the COVID-19 pandemic.

Keywords: industries, COVID-19, Hungary, regression discontinuity design

JEL classification: C500, E230, L600

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Introduction

Pandemics occurred at different stages of human history (Ferguson et al., 2020). The recent crisis was not the first to be experienced by the global community. However, the COVID-19 pandemic presented an unprecedented amount of uncertainty. This led to government regulations made in an attempt to curb the spread of COVID-19. The COVID-19 pandemic is arguably the second biggest economic threat after the Great Depression (Jomo & Chowdhury, 2020). Earlier pandemics not only led to the loss of lives but also had a devastating effect on the economy. Likewise, the COVID-19 pandemic extensively constrained the economic growth around the world, triggered labour supply shortages, layoffs, and lower revenues (Jackson, 2021; Handoyo, 2020). This caused fundamental changes in the operation of businesses in Hungary and disrupted the productivity of various industries. In a broader sense, the COVID-19 pandemic caused profound changes in different sectors of most economies (Ayat & Kang, 2021).

The outbreak of the COVID-19 pandemic developed scholars' interest in investigating its implications. There have been numerous studies on the impact of the COVID-19 pandemic on different industries. For instance, Vet de et al. (2021) observed that COVID-19 negatively affected the EU-27 industries. However, in some industries production increased to a certain extent, e.g. in the digital, pharmaceutical, and food industries. Kapparashetty (2020) investigated the effect of COVID-19 on the industrial sector in India and found that the COVID-19 regulations put a strain on the overall manufacturing industry, which contributed to approximately 20% of the gross domestic product. Even though there have been numerous studies on the consequences of COVID-19 in different industries, there have been few analyses of the impact of the pandemic on the industries in Hungary. Therefore, this study helps to identify which of them were resilient to it. Regression discontinuity design was the econometric method applied in the study to verify the findings. This method can help policymakers to make evidence-based and data-driven decisions. Regression discontinuity in time (RDiT) was the innovative method applied in the study. It showed if there were short-term impacts of COVID-19 in contrast to long-term effects. As Hungary is a country with emerging economy, insights stemming from this study can contribute to better understanding of the consequences of the pandemic for the manufacturing sector in emerging economies.

Theoretical background

The global community suffered a substantial loss in global production due to the centrally imposed COVID-19 regulations. Pianta (2021) suggested that the effects of the COVID-19 pandemic could be understood by analysing the demand and supply. On the supply

side, most industries were heavily impacted by lockdown regulations. Such restrictions resulted in supply shocks, production slowdown, and disruptions of global value chains. On the demand side, the industries were mainly struck by lower consumption due to government control measures such as the closure of shops and restrictions on people's movements. According to Ivanov & Dolgui (2020), the COVID-19 pandemic is among the main disruptions of production in human history. Although the pandemic had a devastating effect on different industries, it was not identical across the economy. Bartik et al. (2020) also noted that the sensitivity of industries to crises was not the same. For instance, unlike the professional service industries that do not require face-to-face contact, other industries were mainly vulnerable to the pandemic shocks.

Furthermore, the disruption caused by COVID-19 resulted in a shortage of raw materials, demand fluctuation, and limited availability of transportation (Eldem et al., 2022). Despite the negative implications of the COVID-19 pandemic on certain industries, durable goods seemed to be resilient to the crisis. Tauber and van Zandweghe (2021) noted that during the COVID-19 pandemic consumers increased their consumption of durable goods because they switched to them from services. Christelis et al. (2020) observed a decrease in the consumption of non-durable goods because of the COVID-19 pandemic. The production of motor vehicles was struck hard by the pandemic (Boranova et al., 2022). Verschuur et al. (2021) found that the total manufacturing industry suffered the most from the COVID-19 pandemic disruption.

Hypothesis development

Éltető (2022) noted that the Hungarian economy heavily relied on foreign capital. In 2019 the share of foreign-owned companies in the production and sales in Hungary amounted to 53%, whereas the share of these companies in the manufacturing industry was estimated at 73%. The OECD (2020) observed that the COVID-19 pandemic caused harsh economic disruptions because of closures in the manufacturing industry, which led to a decrease in international trade. The restrictive measures of the COVID-19 pandemic may have undermined the productivity of the manufacturing industry in Hungary due to its strong embeddedness in global production networks. In fact, Astrov and Holzner's (2021) initial observations indicated that the imposition of the COVID-19 pandemic heavily influenced the Hungarian economy and decreased its productivity. Therefore, the following hypothesis was posed in the study:

- H_1: The COVID-19 pandemic had a negative impact on total manufacturing in Hungary.

The COVID-19 pandemic was a challenge for most industries and economic sectors (Pató & Herczeg, 2020). However, while it affected the total manufacturing sector, its effects were different in individual branches, e.g. the production of durable and non-durable goods. This part of the study is a review of empirical studies on the impact of the pandemic on selected industries in Hungary, including the automotive industry, the production of non-durable goods, durable goods, and raw materials.

Automotive industry

For most Central and Eastern European countries the automotive industry is of key significance and serves as the economic engine in the region. Kufelová & Raková (2020) noted that over the last 20 years the automotive industry had been the major source of foreign direct investment in the region. Bisztray (2021) noted that the manufacturing of motor vehicles was a key industry in Hungary and the Hungarian economy was highly dependent on it. In 2018 in Hungary the share of the automotive industry in export earnings was 16.5%, in foreign direct investment −11.4%, and in domestic employment −2.6% (Török, 2022). The industry significantly contributed to the national economy. However, Molnár et al. (2020) observed that the automotive industry in Hungary was mainly foreign-owned and highly integrated into the global value chain. The disruption of the global supply chain due to the COVID-19 pandemic regulations seems to have slowed down the production of motor vehicles. Juhász and Pokorádi (2022) observed that the production of motor vehicles in Hungary was interrupted by the COVID-19 pandemic. Therefore, the following research hypothesis was posed:

- H_2: The COVID-19 pandemic had a negative impact on the industrial production of motor vehicles in Hungary.

Industrial production of non-durable goods

Non-durable goods such as foods and beverages, clothing and footwear, paper products, and gasoline are made for immediate or almost immediate consumption. The food industry is particularly essential for society and economy at large (Acheampong and Ogbebor, 2021). The food industry in Hungary was substantially affected by the COVID-related restrictions, which limited the distribution of products. According to Benedek et al. (2020), who conducted a fragmentary study of local food producers, 60% of them experienced a loss in sales, whereas only 10% observed an increase. Therefore, the following research hypothesis was posed:

- H_3: The COVID-19 pandemic had a negative impact on the industrial production of non-durable goods in Hungary.

Industrial production of durable goods

Durable goods are part of private consumption in households. They are considered highly sensitive to economic crises and business cycle fluctuations (Dossche and Saiz, 2018). Durable goods are expected to have a life span of over three years. Zieliński (2022) investigated the effect of the COVID-19 pandemic on the Visegrád Group countries and noted that the emergency shutdown decreased the income and consumer spending, encouraged savings while negatively affecting the aggregate demand. In consequence, the consumption of durable goods decreased. Ridhwan et al. (2021) studied the causal impact of the COVID-19 pandemic on the consumption of durable goods in Indonesia. The researchers found that the consumption of durable goods such as furniture, electronics, and jewellery declined. They concluded that households cut the consumption of non-essential goods during the pandemic. Likewise, in the first quarter of 2020 the consumption of durable goods in the Eurozone dropped (Sülün, 2020). Since most shops were closed during the lockdown, many households postponed the consumption of large durable goods. Espitia et al. (2022) noted that during crises consumers may postpone the purchase of durable goods due to high uncertainty, which heavily affects the consumption of these products.

- H_4: The COVID-19 pandemic had a negative impact on the industrial production of durable goods in Hungary.

Industrial production of raw materials

Global supply chains depend on the supplies of raw materials from China and other developing countries (Kumar et al., 2020). The COVID-19 pandemic disrupted the transportation network and affected the sourcing of raw materials from abroad. Cai and Luo (2020) observed two stages in which the industrial production of raw materials was negatively affected by the COVID-19 pandemic. The first stage was associated with the forced interruption of production in China between February and March 2020. This decreased the supply of Chinese raw materials to the European Union. As a result, the export of goods from China to the EU declined. In the second stage restrictive measures such as border closures and lockdowns further decreased the industrial production of raw materials. In 2020 the global production of crude steel decreased by 0.9% (Worldsteel, 2021). It seems that this decline may have been caused by supply chain disruptions as well as the drop in the consumption of durable goods due to the pandemic. Therefore, the following research hypothesis was posed:

- H_5: The COVID-19 pandemic had a negative impact on the industrial production of raw steel in Hungary.

Methods

The industrial production data were sourced from the official Eurostat database. The following indicators were used: the monthly market data for the industrial production of non-durable goods, durable goods, raw steel, motor vehicles, and total manufacturing. The COVID-19 monthly data were sourced from the World Health Organization database. Cumulative cases of COVID-19, i.e. the number of people tested positive, regardless of whether or not they recovered, were used as the proxy variable. Due to the fact that the time frame of the study was small, monthly data were used as some of the key variables had a monthly frequency. The sample period under study ranged from 1 January 2017 to 30 July 2021. Some of the variables referring to industrial production could not be included for evaluation as only quarterly, semi-annual, and annual data were available. Due to the data frequency an adequate number of observations could not be incorporated into the statistical models to produce reliable estimations.

Table 1. Description of variables

Variable	Source
COVID-19 cumulative cases	WHO
Industrial production of non-durable goods	Eurostat
Industrial production of durable goods	Eurostat
Industrial production of raw steel	Eurostat
Industrial production of motor vehicles	Eurostat
Total manufacturing	Eurostat

Source: Authors

Regression Discontinuity Design (RDD) was the methodology used in the study to determine the causal effects of the pandemic on the industrial production indicators. The model is used both in academia and in the industry to perform impact, programme, and policy evaluations. The RDD model is supposed to have a score, treatment, and a cut-off (Cattaneo et al., 2020). In this case, COVID-19 was the score, the indicators of industrial production were the treatments, whereas the difference or impact of COVID-19 was the cut-off. Precisely, the cut-off was the time when the pandemic officially started in Hungary. If the occurrence of the pandemic impacts production positively or negatively, discontinuity of the trend can be observed. If no discontinuity is detected, it means that

the pandemic did not affect industrial production. The model was selected for our study because it effectively investigates and assesses the impact around the occurrence of the pandemic. The Stata software was used for the RD analysis and statistical calculations. Regression Discontinuity in Time (RDiT) was incorporated into the RD model to account for the official COVID-19 date and time near and away from its threshold. The RDiT parameters can be very useful when they are near the threshold and less useful when they are away from it. Relying on observations away from the threshold leads to biased findings. RDiT supports short-run rather than long-run studies (Hausman and Rapson, 2017).

The RD model produces noticeable findings, which can be analysed by observing the RD plots. The state that divides the period before and after the COVID-19 pandemic could be represented as the score of zero at the cut-off point. The cut-off point is equivalent to the official date of the pandemic, 11 March 2020, as declared by the World Health Organization. The left side of the cut-off may be represented by dates before the pandemic. The data during this sample period range from zero to negative. The right side of the cut-off can be represented by dates after the pandemic. The data during this sample period range from zero to positive. This inclusion of the time factor in the model is Regression Discontinuity in Time (RDiT).

The basic RD model can be written as a *linear* constant effect model,

$$E\left(Y_{0i} \middle| x_i\right) = \emptyset + \delta x_i$$
$$Y_{1i} = Y_{0i} + \beta$$

which leads to a linear regression model,

$$(1) \quad Y_i = \emptyset + \delta x_i + \beta D_i + \epsilon_i$$

where,

$$D_i = \begin{cases} 1 \text{ if } x_i \geq x_o \\ 0 \text{ if } x_i < x_o \end{cases}$$

β — the causal effect.
D_i — the regressed interest correlated with x_i — a deterministic function of x_i.

The RD model distinguishes between the linear function x_i, and the non-linear function $1(x_i > x_o)$. If the trend relationship is non-linear, the regression specification can be written as follows:

$$(2) \quad Y_i = f(x_i) + \beta D_i + \epsilon_i$$

where again, $D_i = 1(x_i > x_o)$ is discontinuous in x_i at x_o. If $f(x_i)$ is continuous in a neighbourhood of x_o, it should be possible to estimate a model such as in *equation (2)*, even with a flexible functional form for $f(x_i)$. For instance, when modelling $f(x_i)$ with a p^{th}*-order* polynomial, RD estimates can be constructed from the following regression,

$$(3) \quad Y_i = \emptyset + \delta_1 x_i + \delta_2 x_i^{\,2} + \ldots + \delta_p x_i^{\,p} + + \beta D_i + \epsilon_i$$

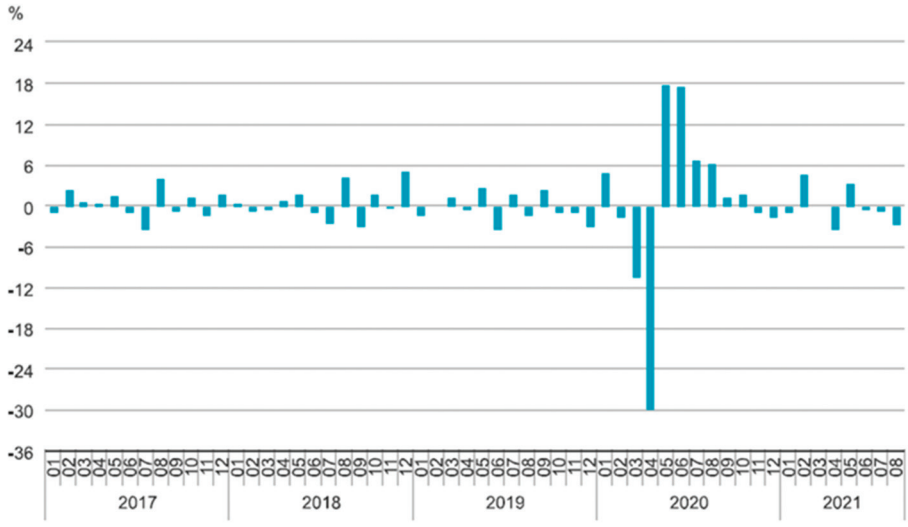
In our study an experimental economic model was applied as treatment. In Figure 8, Panel A depicts a scenario without economic shock. In this scenario, the pandemic was expected not to affect the outcome variables of interests, so there should be a continuous trend at the cut-off. If the *score* of the COVID-19 pandemic had a causal effect on the *outcome*s, there was a jump or a discontinuity of the trend at the cut-off, as shown in panel B.

The RDiT method was considered suitable for this study because it had been increasingly used in empirical studies across different fields such as economics and international trade. Hausman and Rapson (2018) noted that most of these studies were published in high-impact journals with an increasing number of citations. Furthermore, the method is appropriate for proper estimation and interpretation of short-run versus long-run effects. Also, it was used in many recent studies investigating the effects of the COVID-19 pandemic. For instance, Giommoni and Loumeau (2022) used a spatial regression discontinuity design model to evaluate the effect of the COVID-19 regulations such as the lockdown on the voting behaviour in the French municipal elections in 2020. The model was to measure the voting behaviour before and after the lockdown. Camino-Mogro (2022) adopted regression discontinuity in time (RDiT) to analyse the short-term impact of the COVID-19 control measures on the Ecuadorian financial system. Therefore, the RDiT method is also relevant for studying the effects of COVID-19 on selected branches of industrial production.

Results

COVID-19 affected various industrial branches in Hungary. Figure 1 shows changes in the volume of industrial production compared with the previous month. As can be seen, between January 2017 and February 2020 and between September 2020 and August 2021 the changes in industrial production oscillated between 6% and –6%. Between April and July 2020 the changes in industrial production oscillated between –29.9% and 17.8%. In March 2020, when COVID-19 was officially declared as a pandemic, the volume of industrial production decreased by 10.4%. The largest fall was in April 2020, when it decreased by 29.9% (KSH, 2021).

Figure 1. Changes in the volume of industrial production compared to the previous month, 2017–2021

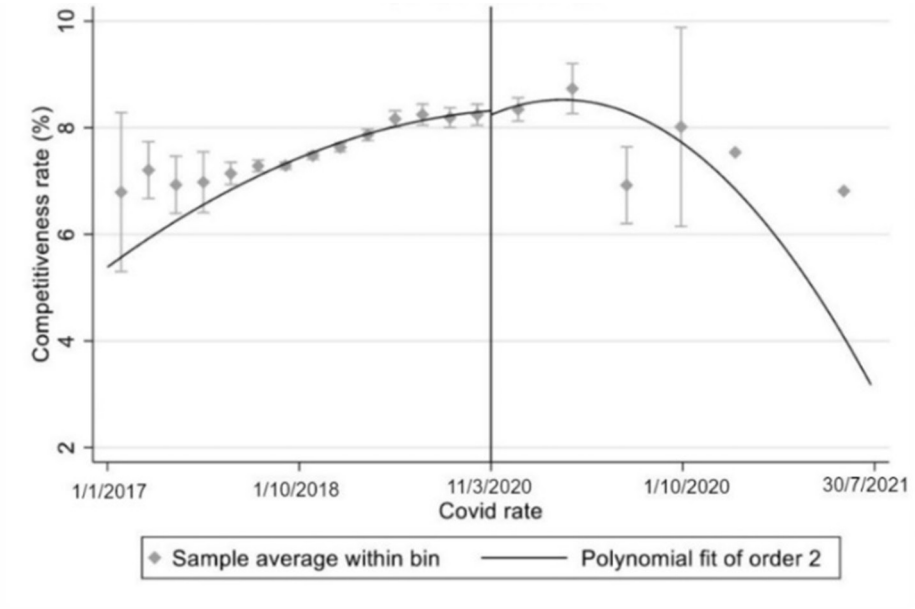


Source: KSH (2021). Note: Seasonally and working-day adjusted.

The estimates from the epicentre of COVID-19 showed that total manufacturing decreased by 12.5%. Figure 2 shows that COVID-19 did not impact total manufacturing. Thus, the estimates disproved the hypothesis that COVID-19 had a negative impact on total manufacturing. This oscillating trend provides convincing views that the total industrial production in Hungary was resilient. However, RDiT enables a more fine-grained analysis.

The RDiT method enabled verification whether COVID-19 had an impact on the volume of production in the selected industries. The RDiT model was used for observations close to the epicentre of COVID-19, for which the optimal bandwidth was chosen (Hausman and Rapson, 2017). The bandwidth in RDiT is the range around the cut-off point that defines the included observations. Thus, the optimal bandwidth included observations closer to the official date of the onset of the pandemic. Observations made close to the epicentre enable the model to determine if there was an impact, and this procedure produces unbiased results. The use of all observations without a set bandwidth produces biased results (Cattaneo et al., 2020). Any bandwidth larger than the optimal one increases the estimation bias. When all observations are taken into consideration, i.e. from January 2017 to July 2021, without an optimal bandwidth, the point estimates turn out to be statistically significant. Therefore, the RDiT model enables reliable estimations by focusing on observations close to the epicentre of COVID-19.

Figure 2. Total manufacturing

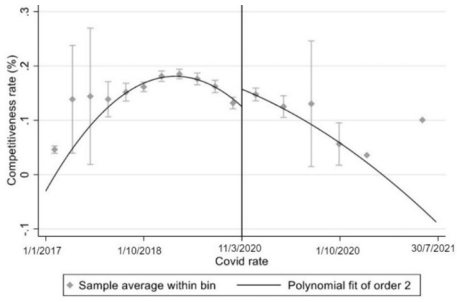


Source: Authors' calculations

For this reason, the neighbourhood around the cut-off was restricted by excluding observations of less than 0.1, a theoretically acceptable neighbourhood range on both sides of the cut-off (Cattaneo et al., 2020). The excluded observations were not within the bandwidth range and further away from the cut-off point. As a result, 2018 observations to the left of the cut-off and 123 to the right of it were obtained. The bandwidth changed from 17.2 to 0.93, which excluded all observations of less than 0.1. The analysis showed that the industrial production of NDGs increased by 3.02%, the production of motor vehicles decreased by 3.5%, the production of durable goods increased by 9.3%, whereas the production of raw steel decreased by 26%. All these point estimates from controlling for the neighbourhood towards the epicentre were statistically significant. This enabled the provision of statistically reliable and robust point estimates. The RD plots are instrumental in explaining the impact of COVID-19. Any discontinuous trend at the cut-off reflects an impact (Camino-Mogro, 2022). The RD plots are produced by running an optimal bandwidth, which is automatically selected by the statistical application. Hence, the plots tend to show the estimates that differ from initial estimations which relied on manually selected observations of less than 0.1. The plots are an adequate guide to verify hypotheses. The RD plots indicate that COVID-19 had an impact on the industrial production of NDGs (Figure 3) and motor vehicles (Figure 4). The impact was marked by a positive jump at the epicentre of COVID-19. The industrial production of NDGs and

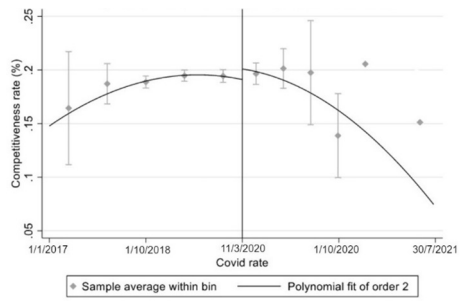
motor vehicles was resilient and can be explained by a positive regression discontinuity trend. However, the movements away from the cut-off show that the production of NDGs and motor vehicles was decreasing. The visual analysis of the RD plots showed that COVID-19 had no impact on the industrial production of durable goods (Figure 5) or raw steel (Figure 6). The null impact of COVID-19 was marked by the continuous trend in these plots. The research findings proved the hypothesis that COVID-19 had an impact on the industrial production of NDGs and motor vehicles. However, they disproved the hypothesis that COVID-19 had an impact on the industrial production of durable goods and raw steel.

Figure 3. The industrial production of NDGs



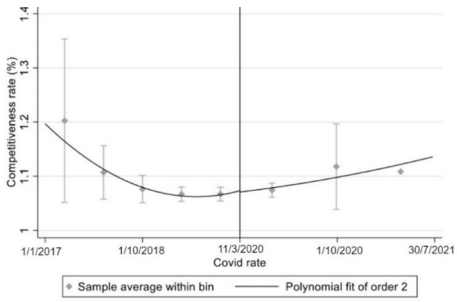
Source: Authors' calculations

Figure 4. The industrial production of motor vehicles



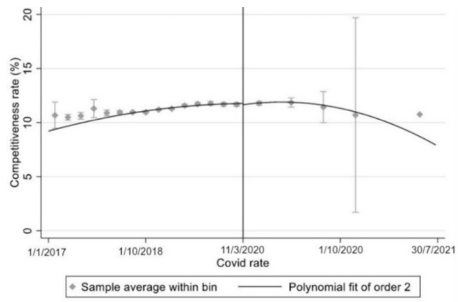
Source: Authors' calculations

Figure 5. The industrial production of durable goods



Source: Authors' calculations

Figure 6. The industrial production of raw steel



Source: Authors' calculations

The research findings were concluded with robustness checks of the RD design. Since the production of raw steel, durable goods, and manufacturing exhibited a continuous trend, the falsification test was applied, in which these covariates were used as the outcome variables. The pre-determined covariates exhibited a continuous trend at the cut-off, as illustrated in Figures 2, 5, and 6. An appropriate approach in a falsification test is

to choose a small neighbourhood around the cut-off and make use of the binomial test within this neighbourhood with a probability of 50%. The binomial strategy tests what would happen if the observations on the left side of the cut-off were treated with a 50% probability. This means that the binomial test shows if there is sorting around the cut-off. The controlled observations are on the left side, whereas the treated observations are on the right side of the cut-off point. The results produced a p-value of 0.057, which means that there is no evidence of sorting at the cut-off with respect to this neighbourhood. Therefore, our findings about the impact of COVID-19 on the industrial productions are consistent with the number of treated and control variables.

The binomial test is supported by the density test of the null hypothesis, which assumes that the density of the running variable is continuous at the cut-off. The null hypothesis describes that there is no difference in the density of the controlled and treated observations. The null hypothesis of the density test has a probability of 50%. In our study the value of the t-statistic was −0.9203, whereas the associated p-value was 0.36. If the p-value of COVID-19 was less than the binomial test p-value, the null hypothesis should not be rejected. Therefore, since the p-value [0.36] was less than the density test probability [0.5], there was no difference in the density of the observations.

Implications for theory and policy

In Hungary, more emphasis has been placed on qualitative studies dealing with the implications of COVID-19 for industrial production. There have been few quantitative studies with models assessing the effects rather than the impact of COVID-19 and they had no relevance to industrial production. Our study is different from most studies, which attempt to investigate the effect rather than the impact of COVID-19 on the industrial production in Hungary. In contrast to various causal models, the choice of the RDD model helped to successfully investigate the probability of the impacts. Various scholars have attempted to study the effects of COVID-19 on the industrial production in Hungary and based their investigations on trends, maps, surveys, policy documents, social accounting matrix, and case studies (Pianta, 2021; Nyikos, Soha, & Béres, 2021; Karácsony, P. (2020); Fehér et al., 2022). There have been few studies based on regression analysis models such as Principal Component Analysis (PCA) and Social Accounting Matrix (SAM) (Zamfir & Lordache, 2022; Kovács et al., 2020). However, these academic studies and other non-academic studies attempted to assess the effects rather than the impact.

Our findings showed that the intervention policy to mitigate and combat the COVID-19 pandemic should be imposed as early as possible to avoid a major fall in industrial production. Our study also showed that the policy responses at the epicentre of the pandemic enabled the automotive and non-durable goods industries to increase production. Such

policy responses should be applied long before the pandemic becomes a major concern. The resiliency of the Hungarian industries tended to vary when there was a persistent exogenous shock. The positive shocks at the epicentre of the pandemic in the automotive and NDGs industries resulted from the active policy response. Our findings showed that the impact of the pandemic can be detrimental in the absence of an active and effective policy response. In view of the fact that the COVID-19 pandemic had a negative impact on the automotive and NDGs industries, policies improving the condition of the affected industries should be introduced. According to Klein et al. (2021), in order to make sure that the automotive industry is resilient, the CEE region, including Hungary, should encourage policies improving the climate for investments and ensure that viable firms in the region are resilient to the crisis. Furthermore, the region should adapt skills to the fast-changing needs of automotive manufacturers and address the issue of labour shortages. It can be assumed that people wanted to hoard non-durable goods, fearing they could become less available in the future. Cooper and Gordon (2021) observed that in response to COVID-19, due to the possible future shortage of resources there was an increase in panic buying in the early 2020s. To mitigate the negative effects of crisis on the NDGs industry in the future, governments at all levels could introduce policies discouraging misinformation, they should consistently provide updates on industries and disincentivise rumours (Mao, Hou, & Xie, 2022).

Conclusion

Our study offered novel contributions based on the relationships between variables and the RDD model as a reference. The results showed that the industrial production of non-durable goods and motor vehicles was impacted at the epicentre of the COVID-19 pandemic. However, these industries were resilient, as evidenced by a positive regression discontinuity trend. The results also showed that further away from the epicentre, production was negatively affected, whereas the production of non-durable consumer goods (NDGs) and motor vehicles experienced a real shock. The pandemic did not have an impact on the production of durable goods, raw steel, and total manufacturing, as evidenced by a continuous trend at the epicentre of COVID-19.

As results from our research findings, the RDiT model enabled successful investigation of the impact of the COVID-19 pandemic. The industrial production in Hungary was resilient to one of the biggest crises ever experienced by the world. However, our study had some limitations. Some indicators of industrial production could not be included for evaluation as their data frequency was annual. As the study was conducted only in Hungary, a similar RDiT method could be used in further research to investigate more countries in Central and Eastern Europe and check whether the findings are consistent. This would help to explain the possible contributing factors of any deviation from the

results. Furthermore, comparative analyses of emerging and advanced economies could be conducted. This would help to determine whether the COVID-19 disruption had similar effects on selected industrial production in economies at different levels.

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The Impact of the COVID-19 Pandemic on Local Government Finances — a Case Study of Holiday Resort Communes in Poland

Abstract. The outbreak of the COVID-19 pandemic forced governments to implement non-pharmaceutical interventions, i.e. solutions known as lockdown. Reduced business opportunities inhibited most economic processes, which resulted in a collapse of the global economy. Some sectors of the global economy (e.g. tourism) have been more severely affected by the pandemic. Therefore, both the national and local authorities provided special aid packages to support tourism. The Polish government decided to allocate additional funds, i.e. 250 million dollars (1 billion zlotys) to holiday resort communes, but the funds were reserved only for the communes located in the mountains. This study is an attempt to verify how the lockdown affected the finances of typical mountain and seaside resort communes and to assess whether the communes located in the mountains were affected to a greater extent. The authors of the study compared similar entities: a typical seaside resort commune — Mielno, and a typical mountain resort commune — Karpacz. The analysis covered the period of 2010–2020. Secondary data came from the Local Data Bank (BDL) of the Central Statistical Office (GUS) and annual reports on the implementation of commune budgets. The research was based on the index method, descriptive statistics and the least squares method. The Baretje-Defart index was used to determine the tourist function of the communes. Selected indicators developed by the Ministry of Finance were used to assess the financial situation. The study showed that the COVID-19 pandemic lockdown affected the financial situation of the typical mountain resort commune in Poland more strongly than the finances of the typical seaside resort commune. The study also showed that both types of holiday resort communes struggled with the problem of significantly reduced budget expenditures.

Keywords: local government finances, COVID-19 pandemic, tourism
JEL classification: H71; H72; Z32
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Introduction

The outbreak of the COVID-19 pandemic in 2020 was an unexpected event to all countries around the world. The vision of the unrestricted spread of infections forced governments to make drastic decisions and introduce a lockdown to limit interpersonal contacts to a minimum. In consequence, the activity of some sectors of the economy was partially or

even completely frozen. Like most EU member-states, Poland temporarily stopped tourism. This sector was heavily affected by the pandemic. The revenues of the communes whose budgets largely depend on tourism decreased significantly. Therefore, the Polish government decided to support only holiday resort communes located in the mountains and divided one billion zlotys from the Local Investments Fund between more than 200 entities. No financial support was provided to other holiday resort communes, e.g. the ones located at the seaside. It was due to the seasonal nature of tourism in these places, which meant that they were to be less affected by the winter-autumn lockdown. There arises the question whether the pandemic really affected the finances of communes located in the mountains more strongly? The authors of this study decided to verify this problem and formulated the following research question: Did the COVID-19 pandemic lockdown in 2020 affect the financial condition of the seaside resort commune of Mielno and the mountain resort commune of Karpacz equally? The authors of the study posed the main hypothesis that the lockdown had a greater negative effect on the finances of the commune of Karpacz. An auxiliary hypothesis was that the lockdown significantly reduced the expenditure in both communes.

The aim of the study was to analyse the impact of the pandemic on the finances of typical seaside and mountain resort communes in Poland. There have been numerous studies verifying the impact of the COVID-19 pandemic on the national economies and the situation of entrepreneurs, but much less attention has been paid to the situation of local governments (Valaskova, Durana, and Adamko, 2021). So far research has shown that during the pandemic communes experienced significant problems due to limited income and increasing expenditure on counteracting the effects of COVID-19. As a result, they had to waive capital expenditures and increase debt (Emergency Governance Initiative, 2021). Due to the relatively strong dependence of holiday resort communes on tourism, which was severely affected by the pandemic, these local governments were at risk of severe financial consequences as their income had decreased (World Bank, 2021). This chapter analyses this important issue and in the future it can be used by state authorities to make more effective decisions about the finances of local governments, both during an economic crisis and when the economy is functioning normally. It can also be used by local authorities to update and improve their budgetary policy.

1. Literature review

The outbreak of the COVID-19 pandemic and its violent course surprised people and governments all over the world. A few months after the first case of the disease occurred in Wuhan, China, the virus reached almost all continents and more than 200 countries (WHO, 2020). By January 2022 over 300 million infections and 5.5 million deaths had

been recorded (Ritchie et al., 2020), making the COVID-19 pandemic one of the deadliest in human history — following the smallpox (1520–1979 — 56 million deaths), Spanish flu (1918–1920 — 50 million deaths), and plague pandemics (1347–1351 — 25 million deaths) (Medicover, 2021).

According to Baker, Bloom, Davis, Kost, Sammon, and Viratyosin (2020), the COVID-19 pandemic had the greatest impact on the global economy mainly due to advanced globalisation. Internal problems of one country (e.g. a large exporter) may shake the international economic system. On the other hand, it is impossible to reliably analyse the socioeconomic effects of, for example, the plague in the fourteenth century. Therefore, the comparability of these events is limited. However, it is possible to make such comparisons about the pandemics in the 20th and 21st centuries. Barro, Ursua, and Weng (2020) analysed 48 countries and found that in comparison with Spanish flu, COVID-19 dramatically slowed down the global business activity, especially at the beginning of the pandemic. Global production and consumption, and consequently the GDP, decreased significantly. Other studies showed that unlike the bird flu, SARS, swine flu, Ebola, and MERS pandemics, the negative impact of the COVID-19 pandemic on the global economy, including the stock market, was unprecedented (Shehzad, Xiaoxing, and Kazouz, 2020; Ashraf, 2020; Harjoto, Rossi, and Paglia, 2020; Narayan, Phan, and Liu, 2020; Harjoto et al., 2021; Zhang, Hu, and Ji, 2020; Cepoi, 2020; Salisu and Sikiru, 2020; Sergi et al., 2021; Baker et al., 2020).

The outbreak of the COVID-19 pandemic triggered a violent international economic shock, which even overshadowed the most recent major financial crisis of 2007–2008 (Fernandez, 2020; Baker et al., 2020; Shehzad, Xiaoxing, and Kazouz, 2020). The economies of almost all countries, including the most developed ones, started to shrink rapidly. In the second quarter of 2020 the US GDP decreased by over 30%, whereas the global GDP decreased by 4.3% in 2020, resulting in the deepest global recession in 80 years (World Bank, 2021). These data provide evidence that the COVID-19 pandemic led to the greatest global economic disruptions since the Great Depression. This fact was also confirmed by wider analyses (Nicola, Alsafi, and Sohrabi, 2020). The unemployment rate, inflation, and the overall level of poverty began to rise sharply even in developed countries (Sergi et al., 2021). Researchers emphasise the fact that high unemployment, which deepens the economic shock, complicates a recovery from recession (Auray and Eyquem, 2020; Kong and Prinz, 2020; Jones, 2022; Wilson and Papoutsaki, 2021).

According to Harjoto et al. (2021), the impact of the COVID-19 pandemic on the global economy varied depending on the phase of the pandemic, the number of cases, and the dynamics of infections. Goodell (2020) proved that the initial phase of the pandemic was the most destructive for the world economy. However, the main problem for the economy was not the pandemic itself, but the method governments used to combat it. They applied non-pharmaceutical interventions (NPI), i.e. lockdown: social distancing,

stay-at-home orders and temporary stopping or limiting the activity of some economic sectors (Di Porto, Naticchioni, and Scrutinio, 2021; Cipolla, 1981; Hatchett, Mecher, and Lipsitch, 2007; Eichenbaum, Rebelo, and Trabandt, 2020). As a result of the international lockdown, diversified in many respects, but implemented globally by most countries or local governments, production and consumption collapsed (McKibbin and Fernando, 2021; Yilmazkuday, 2020). Interrupted supply chains later turned out to be one of the main reasons why the possibilities of rapid recovery from the global recession were limited.

The COVID-19 pandemic showed that the globalisation processes, which link the economies of individual countries, made the global recession affect not only national budgets but also the budgets of local governments. Ultimately, even the income and expenditure of communes, which are at the lowest level of the state decentralisation system, were influenced by factors beyond the control of the state (Loucanova et al., 2021). The situation was similar during the economic crisis of 2007–2009, when as a result of globalisation, the recession affected most countries, including their local governments (Stofkova and Sukalova, 2020). The report of the World Bank (2021) on the COVID-19 pandemic clearly showed that in consequence of the lockdown, the income of communes decreased even in the most developed countries. At the same time the overall expenditure level increased due to the need to combat the effects of the pandemic, or to maintain the expenditure at a similar level to the pre-pandemic time. This translated into an increase in the budget deficit and, in the long-term perspective, a higher debt. In 2020 the income of as much as 96% of the communes in the US decreased (Li and Lu, 2020). The global decrease in the income of communes around the world amounted to 10% in 2020 (Emergency Governance Initiative, 2021). As NPI tools limited budgetary revenues, it was necessary to limit expenditure in order to minimise the risk of an excessively high deficit (Soltes, Stofkova, and Durica, 2021). The analyses of the World Bank (2021) showed that local governments reduced their expenses, especially on investments. Two thirds of local governments around the world refrained from even the most important investments (Emergency Governance Initiative, 2021) because usually they were not basic needs and the possibilities of financing projects with external capital (usually the main source of investment financing) were limited during the COVID-19 pandemic (Li and Lu, 2020). However, at the same time local governments had a problem with increased expenses on counteracting the spread of COVID-19. In consequence, the expenditures of local governments increased by 5%, which also increased the debt of about 20% of communes (Emergency Governance Initiative, 2021).

Analyses of the impact of the pandemic on the structural elements of the global economy revealed a particularly strong negative influence of the lockdown on road, sea, and air transport (Zhang and Tong, 2021; Zhang, Hu, and Ji, 2020). The NPI tools temporarily or completely limited mobility. For the same reasons, tourism was one of

the most strongly affected sectors by the COVID-19 pandemic (Zhang, Hu, and Ji, 2020; World Bank, 2021). The diversified influence of the lockdown on specific sectors of the economy resulted in different effects of the pandemic in specific regions and communes (Soltes, Stofkova, and Durica, 2021) with certain specialisation in the economic structure. This fact was confirmed by Hu, Li, and Dong (2022), who conducted a case study of Chinese cities. Due to the dependence of national, regional, and local budgets on specific economic sectors (e.g. tourism), they were more severely influenced by the negative economic effects of the lockdown. The World Bank (2021) emphasised that the impact of the pandemic on the finances of local governments was diversified and mainly depended on their economic structure. The more diversified the sources of income in the commune were, the less its finances were affected by the COVID-19 pandemic. The holiday resort communes which heavily depended on one sector, i.e. tourism, were at high financial risk. When looking for specific reasons why holiday resort communes were more strongly influenced by the recession, it is important to note that developed holiday resort communes have a relatively higher share of their own income in the total income (Bovsh et al., 2021), or according to other criteria — a higher share of current income. The analyses of the World Bank (2021) showed that the lockdown either had limited business activity or led to its suspension. As the government introduced tax breaks for companies, the income of communes, including the property tax revenue, became significantly limited. Normally it is a stable source of finance for local governments with numerous accommodation facilities. Research has shown that during the COVID-19 pandemic the overall income of communes from local taxes and fees decreased by as much as 22% (Emergency Governance Initiative, 2021).

The comparison of the costs and actual benefits resulting from the application of NPI tools (Di Porto, Naticchioni, and Scrutinio, 2021) provoked a social discourse on the economic consequences of the lockdown. However, it is not easy, because the actual costs of combating the pandemic can be estimated only many years after it has ended. According to Smith (2006), the SARS pandemic (2002–2003), mainly in China, cost the world economy up to 100 billion dollars. In view of the fact that the COVID-19 pandemic has been the most destructive event to the global economy since the 2007–2008 financial crisis, most countries and regions decided to use the available tools of economic intervention to protect their economic sectors with financial resources. For example, the EU decided to create a reconstruction plan — NextGeneration worth 0.8 trillion euros (European Council, 2020). Even larger amounts were transferred in Germany — 0.86 trillion euros (Business Insider, 2020) and in the USA, where 2.6 trillion dollars turned out to be the largest aid package in history (U.S. Government, 2021). The governments' reactions were so quick that in the first two months of the pandemic the total value of aid packages amounted to approximately 10 trillion dollars — almost three times more than during the entire financial crisis of 2007–2008. At the same time, Western countries

announced the total economic support of around 4 trillion dollars, i.e. about 30 times more than the value of the Marshall Plan today (Cassim et al., 2020).

The Polish government also provided an aid package — an anti-crisis shield worth approximately 60 billion dollars. Of the total amount, about 5 billion dollars (over 20 billion zlotys) was allocated to the tourism industry, which had been strongly affected by the lockdown. According to the public finance priorities identified by the World Bank (2021) during the COVID-19 pandemic, the financial capacity of local governments should be stimulated by state authorities by supplying local economies with direct money transfers. This decision was arguable due to the fact that local governments with greater financial capacity are capable of faster and smoother economic recovery. Moreover, it turned out that the communes which were in a better financial situation or received strong support from the government during the COVID-19 pandemic absorbed income shocks more flexibly. Holiday resort communes are more independent of stable sources of financing and the share of transfers from the state budget in their total revenue is lower. This fact strengthened the belief that they could have suffered relatively greater financial losses. In response to the situation, the Polish government allocated about 250 million dollars (1 billion zlotys) to directly support over 200 communes located in the mountains (PL Government, 2021), which, in the opinion of the government representatives, suffered the most of all holiday resort communes (Polish Press Agency — PAP, 2021). Representatives of other holiday resort communes, including those located at the seaside, disagreed with this decision and protested to it. The Marshal of the West Pomeranian Voivodeship spoke many times on behalf of these communes and demanded support for all of them (Rzeczpospolita, 2021).

There should be no objections to the support offered by governments to the tourism industry, which is one of the most severely affected sectors by the lockdown. On the other hand, the support offered to the communes which can hardly be classified as holiday destinations but are nevertheless referred to as holiday resort communes may arouse controversy. The commune is a basic unit of local government, based on the principle of decentralisation of public authority. Decentralisation is understood as the transfer of certain power and responsibility to the community forming a local government (Patrzałek, 2004). This devolution is based on the principle of subsidiarity, which is an important element rationalising the function of the public sector (Dolnicki, 2012). As a result of the decentralisation of public authority, local governments were established. They represent individual communities operating independently within specific administrative territories and have their own, autonomous authorities responsible for the implementation of specific tasks (Dylewski, Filipiak, and Gorzałczyńska-Koczkodaj, 2006). A local government is an element of public administration. It has specific functions and financial resources to implement commissioned tasks (Ochendowski, 2000). The authors of reference publications usually use the term *financial independence* to refer to a certain type of

financial independence of local governments. According to Denek, Sobiech, and Wolniak (2001), financial independence is fully based on the right of local authorities to decide on their financial policy, the amount and structure of income and expenditure. Kańduła (2003) emphasised the fact that the management of local government finances cannot be perceived as full freedom, because expenditure, income, and mixed independence are regulated by legal provisions imposing some limitations.

The considerations concerning direct and indirect dependences between the commune and tourism should focus on finances, especially income. According to Miszczuk, Miszczuk, and Żuk (2007), the main sources of income for communes are: personal income tax (PIT) and corporate income tax (CIT), fees (e.g. taxes, market fees, local fees, resort taxes, administrative fees), local taxes (e.g. agricultural tax, forestry tax, real estate tax, inheritance tax, donation tax, motor vehicles tax), income on property (e.g. property sale, lease, and rental, subsidies and funds allocated for investments), and state budget resources (general subsidies and targeted subsidies). Due to the specificity of communes, their revenues differ not only in the amount but also in the structure. It is particularly interesting to analyse the situation of holiday resort communes where tourism is the primary source of income for the local community (Klonowska-Matynia and Sobko, 2018). As results from research, the condition of the local finances of holiday resort communes are better than average (Drygas et al., 2014; Kędziorek and Różycka, 2016; Sobko and Klonowska-Matynia, 2019). Researchers present the importance of tourism for local governments even more broadly, as they prove that due to the direct impact of tourism on finances this sector is one of the main determinants of local socioeconomic development (Derek, Kowalczyk, and Swianiewicz, 2005; Szpilko, Gierałtowska, and Golubiewska, 2013). Stanny (2013) emphasised the importance of tourism for development, because in many cases the transformation of agricultural communes into holiday resort communes resulted in dynamic and relatively high socioeconomic development. The relationship between tourism, the finances of communes and their development was also observed by Sobko and Janiszewska (2020), who found that local governments in holiday resorts were richer than average and well-developed. According to Sobczyk (2005), the authors of scientific publications have no doubts about the existence of a feedback loop between the financial situation of local governments and the development of communes.

Despite the knowledge of the positive influence of tourism on the finances of communes and their development, it is still possible to consider how the development of tourism in a specific area has affected the local government. The phenomenon can be easily explained because the development of tourism is accompanied by the development of entrepreneurship offering services to tourists. This factor directly influences the finances of communes and indirectly influences the building of a long-term path of local development (Kędziorek and Różycka, 2016; Zioło, 2015; Zioło, 2006). Thus, due

to the specificity of tourist services, the development of tourism causes the development of local entrepreneurship, which can be mostly observed through higher income, especially from PIT and CIT, real estate tax, local tax, resort tax, market fees, and fees on the sale of alcohol. These aspects should be taken into account when considering the finances of holiday resort communes. Various elements should be taken into account in the analysis of finances due to their multidimensional nature (Stanny and Strzelczyk, 2017). Researchers usually conduct general analyses of the finances of communes, assess their financial situation and their ability to settle current and future liabilities on time (Bury and Dziekański, 2012). According to Dylewski, Filipiak, and Gorzałczyńska-Koczkodaj (2004), basic indicators used by the Ministry of Finance to assess the financial situation are universal and effective measures for such an analysis. In practice, researchers often these use indicators to assess the finances of communes (Table 1).

Table 1. Selected examples of research on the finances of communes in Poland

Purpose of research	Input data	Source
Assessment of overall financial situation with synthetic indicator	Simple variables per capita, incl. own income, subsidies, general subsidy, income from PIT and CIT, investment expenditure	(Dziekański and Wyszkowski, 2018)
	Indicators used by Ministry of Finance to assess financial situation	(Satoła and Luty, 2016; Głowicka-Wołoszyn and Wysocki, 2017; Sobko and Janiszewska, 2020; Sobko et al., 2021; Ossowska and Ziemińska, 2010)
Assessment of overall financial situation with ANOVA		(Standar, 2013)
Assessment of overall financial situation		(Satoła, 2010; Satoła, 2015)

Source: Author's original compilation

The selection of indicators and methods may vary depending on the specific approach to finance and specificity of the commune under analysis. However, as Klepacka and Kusto (2009) and Swianiewicz (1989) noted, when analysing the finances of communes, the most important indicators should be taken into consideration, as too broad an approach to this issue may be an obstacle to reliable analysis.

2. Research methods

The study was conducted on the seaside resort commune of Mielno and the mountain resort commune of Karpacz. The two communes strongly depend on tourism. The level of this dependence is similar to other holiday resort communes in Poland (Sobko, 2021).

They have similar populations. In 2020 there were 4,881inhabitants in the commune of Mielno and 4,487 inhabitants in the commune of Karpacz. They have similar budget structures (a high share of current income in the total income: 89% in Mielno and 96% in Karpacz in 2020; a high share of revenue from the real estate tax in the current income: 34% in Mielno and 28% in Karpacz; a high share of revenue from the local tax in the current income: 7% in both communes). The analysis was based on the data from the Local Data Bank of the Central Statistical Office (BDL GUS) and annual budgetary reports of local government units (LGU) for 2010–2020.

The analysis of the possible impact of the lockdown on tourism in these communes was based on the number of tourists and the Baretje-Defart index, which is one of the most common measures used to estimate the tourist function of a region, i.e. its economic dependence on tourism (Chudy-Hyski, 2006). This indicator is expressed as the number of beds per 100 inhabitants (Warszyńska, 1985). The selected aspects of the finances of the communes were verified with specific indicators used by the Ministry of Finance in Poland to assess the financial situation of local government units (Table 2).

Table 2. Indicators used to assess the financial situation of local government units

Indicator type	Indicator name	Formula	Legend	Interpretation
Financial	WB_1	$\frac{I_t}{I_c}$	I_t — total income I_c — current income	The share of current income in total income. The higher the value, the greater the independence of finances from the sale of property.
Financial	WB_3	$\frac{S_o}{I_t}$	S_o — operating surplus I_t — total income	The investment potential (possible increase in liabilities) or the possibility to increase current expenses. Higher values are desirable.
Financial	WB_7	$\frac{S_o + I_p}{I_t}$	I_p — property income S_o — operating surplus E_p — property expenses	The degree of financing of investments with own funds. The higher the value, the lower the risk of losing financial liquidity. A high value may also mean a low level of investment involvement in relation to the potential.

Source: Author's original compilation based on: Ministry of Finance, Indicators for assessing the financial situation of local government units in 2017–2019, Warsaw 2020.

The analysis of the finances of the communes included checking the degree to which the items of the budget which were the most strongly related to tourism were implemented in 2020. This enabled assessment whether changes in the budget had been planned or had been caused by the events which had not been taken into account before, such as the COVID-19 pandemic.

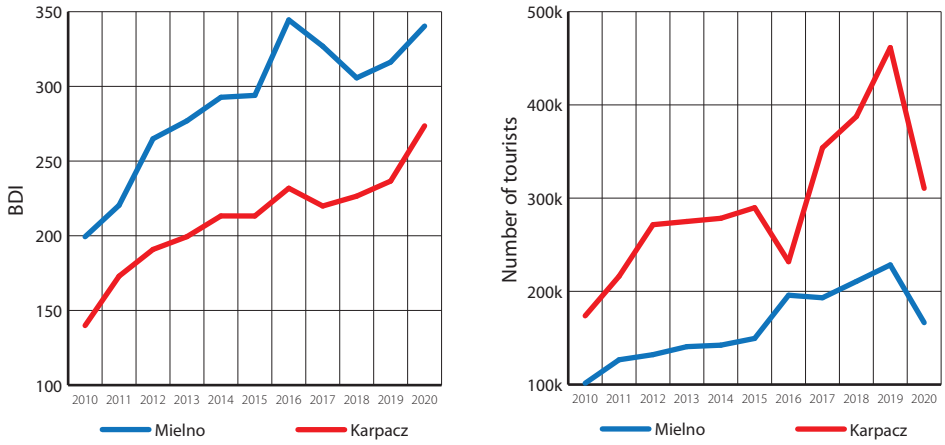
The aforementioned events were analysed with the descriptive statistics method. The least squares method was used to estimate the parameters of linear regression (Yan and Gang Sun, 2009; George, Seber, and Lee, 2003). As a result, models describing the total income and total expenditure in both communes were created. The forecasts from the models were used to find differences between the actual and estimated income and ex-

penditure. Deviations from the forecasted values were assumed to have been caused by the COVID-19 pandemic.

3. Results

The analysis of the significance of the lockdown for the finances of holiday resort communes should be preceded by verification whether their situation actually affected the tourist traffic and thus their main source of income. The Baretje-Defart index, which is a measure of tourism development, and the intensity of tourist traffic (the number of tourists visiting the communes per annum) were used to compare the tourist function of the communes. As the former indicator takes relatively stable variables into account, only the latter measure showed that tourism had actually slowed down in 2020. The number of tourists in the commune of Mielno decreased by 27%, whereas in the commune of Karpacz — by 33% (Figure 1).

Figure 1. The Baretje-Defart tourist function index (BDI) and the number of tourists in the communes of Mielno and Karpacz between 2010 and 2020



Source: Author's original compilation based on the BDL GUS.

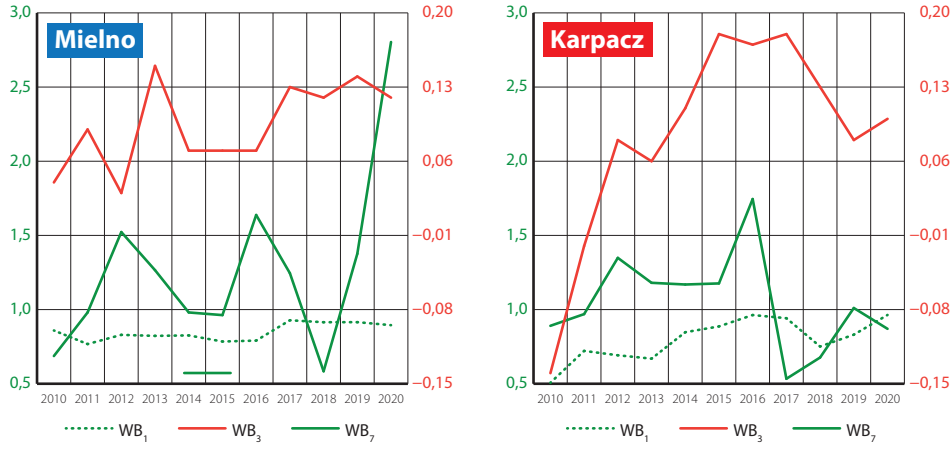
The first stage of assessment of the effect of the COVID-19 pandemic on the finances of local governments involved estimation of the values of the WB_1, WB_3, and WB_7 indexes (Figure 2). The measures spanned a period of eleven years to avoid errors in interpretation and to better present the phenomenon.

In 2020 there was a y/y decrease in the WB_1 (–2%) and WB_3 (–9%) indexes in the commune of Mielno. It is noteworthy that these values followed the trend occurring

since 2017. For this reason, it can be assumed that the direction changes in the values of variables in 2020 was not affected by the lockdown. The WB_7 index (103%) exhibited a different, positive growth trend, but it was also in line with the trend occurring for three years. The relatively high value of the WB_7 index in 2020 may have resulted from a relatively strong reduction in the capital expenditure during the pandemic and, consequently, from the unused investment potential. This assumption was confirmed by detailed analysis of the budget (Table 3).

The situation in the commune of Karpacz was slightly different. In 2020 there was a trend-breaking increase in the WB_3 (30%) and WB_7 (–14%) indexes. The first value marked a positive change, which may have been caused by a limited amount of real estate sold in a period of high uncertainty. Paradoxically, the local government could not obtain the assumed revenues from the sale of property due to the pandemic, which ultimately resulted in the desired change in the value of WB_3 (see Figure 3). On the other hand, there was an unfavourable negative change in the value of WB_7. This means there was an increased risk of the loss of financial liquidity. It may have been caused by higher capital expenditure, lower property income, and a lower operating surplus (lower current income or higher current expenditure). During the pandemic the reduction of capital expenditures seemed to be the dominant phenomenon, but the value of the WB_7 index shows that there was a proportionally greater reduction in the sum of the operating surplus along with the property income. A more detailed budget analysis confirms the fact that the value of the ratio was relatively strongly influenced by a sharp decline in the property income (Table 3). The change in the WB_1 index (16%) was the only increase following the three-year trend.

Figure 2. Selected indicators of the financial situation of the communes of Mielno and Karpacz between 2010 and 2020.



Source: Author's original compilation based on the BDL GUS

It is noteworthy that while the changes in the values of the WB_1, WB_3, and WB_7 indicators may have resulted from the decisions planned by the local authorities (e.g. the sale of assets or starting a large investment) rather than the lockdown, the degree of implementation of certain items may be a measurable effect of the pandemic. A relatively large deviation of the indicator from the forecasted values in the budget of the commune directly indicates sudden, unplanned circumstances which hindered the implementation of some budget categories. The lockdown was undoubtedly such a situation. Therefore, in the next stage of the study individual amounts in the budget were analysed. Apart from the basic means, the budget included income specific to holiday resort communes, e.g. income from PIT, CIT, real estate tax, local tax, alcohol sales fees (Table 3).

Table 3. The income and expenses in the communes of Mielno and Karpacz during the pandemic — selected measures

Commune		Mielno				Karpacz			
		Year 2019	Year 2020	Increase y/y	Degree of implementation*	Year 2019	Year 2020	Increase y/y	Degree of implementation*
Income	Total income [million zlotys]	52.22	54.13	4%	109%	45.71	38.54	–16%	93%
	Property income [million zlotys]	7.56	5.69	–25%	380%	7.73	1.40	–82%	4%
	Current income [million zlotys]	47.79	48.44	1%	100%	37.97	37.14	–2%	96%
	Income from PIT [million zlotys]	5.17	5.08	–2%	97%	5.20	5.01	–4%	97%
	Income from CIT [million zlotys]	0.18	0.05	-70%	107%	0.21	0.20	–4%	81%
	Income from property tax [million zlotys]	15.78	16.50	5%	102%	11.93	10.27	–14%	90%
	Income from local tax [million zlotys]	3.72	3.58	–4%	95%	2.92	2.58	–12%	97%
	Income from alcohol sales fees [million zlotys]	1.10	1.09	–1%	99%	0.80	0.89	12%	114%
Expenses	Total expenses [million zlotys]	51.35	46.16	–10%	78%	45.59	39.32	–14%	93%
	Current expenses [million zlotys]	40.70	41.74	3%	85%	34.44	33.26	–3%	85%
	Property expenses [million zlotys]	10.65	4.42	–58%	44%	11.15	6.06	–46%	15%

*The degree of implementation in relation to the originally adopted budget.

Source: Author's original compilation based on annual reports on budget implementation in the communes of Mielno and Karpacz.

The degree of implementation of selected budget categories was analysed to investigate the possible impact of the lockdown on the finances of the two communes. The income in individual categories may have decreased for reasons other than the pandemic. For example, the property income in the commune of Mielno decreased by a quarter, but not as a result of the pandemic. A closer look at the budget implementation showed that the planned income had been highly exceeded — it amounted to 380%. It is noteworthy that the most important items in the budget are usually planned in such a way that the degree of their implementation exceeds 100%. For this reason, it was assumed that an anomaly resulting from lockdown would produce a fulfilment value not exceeding 96% (see bolded text in Table 3). There were excessively high deviations in 4 out of 11 cases in the commune of Mielno and in 8 out of 11 cases in the commune of Karpacz. The average deviation of the anomalies from the full implementation in the commune of Mielno was 25 percentage points, whereas in the commune of Karpacz it was 30 percentage points. In both communes the degree of expenditure implementation was an anomaly. Only in the commune of Karpacz the degree of implementation of specific items of income was lower than 96%.

The table above shows which items of the budget were more strongly affected by the lockdown and the consequent decline in tourism. However, this is not sufficient to empirically prove the impact of the lockdown on the finances of communes, because it is difficult to clearly determine to what extent the deviation from the assumed budgetary amounts occurred as a result of the pandemic, and to what extent due to other factors. For this reason, the least squares method based on 11 periods (2010–2020) and the variables shown in Table 3 was used to construct econometric models in order to estimate the empirical significance of the lockdown for the total income and expenses of the communes under study. As the first ADF test indicated a problem of non-stationarity, the variables were transformed into the first increments of logarithms (ld). While this ensured stationarity, the data transformation made the interpretation of absolute values impossible and a relative interpretation had to be applied instead. This enabled the creation of the best-fitted, statistically significant models (Table 4), characterised by the normal distribution of the random component, the absence of residual heteroscedasticity, and the stability of the structural parameters.

The four linear models constructed with the OLS method enabled the comparison of the forecasted values with those actually recorded in 2020, which showed the losses caused by the lockdown. The analysis consisted in comparing the actual values of total revenue and total expenditure in 2020 in the communes of Mielno and Karpacz with the values estimated in the models. The analysis showed that in comparison with the value estimated in the model, the local government in Mielno lost about 0.5 million zlotys (less than 1% of the revenue in 2019). The authorities did not manage to expend about 8.2 million zlotys (almost 16% of the expenses in 2019). In comparison with the value

estimated in the model, due to the pandemic the income in the commune of Karpacz decreased by about 5.9 million zlotys (13% of the revenue in 2019). The town cut its expenditures by about 9.1 million zlotys (slightly less than 20% of the expenses in 2019).

Table 4. The parameters of the econometric models

X	Y= ld_ total income in commune of Mielno**	Y= ld_ total income in commune of Karpacz**	Y= ld_ total expenditure in commune of Mielno***	Y= ld_ total expenditure in commune of Karpacz***
const	–0.151*	0.355	0.032**	0.001
ld_ property income	0.125**	0.236**	—	—
ld_ current income	0.870**		—	—
ld_ income from PIT	0.774*	0.120	—	—
ld_ income from CIT	–0.186*	—	—	—
ld_ income from local tax	0.487**	—	—	—
ld_ income from alcohol sales fees	0.330	1.970	—	—
ld_ income from property tax	—	0.160	—	—
ld_ current expenses	—	—	0.364**	0.746**
ld_ property expenses	—	—	0.203***	0.267***
Adj. R^2	**0.960**	**0.870**	**0.980**	**0.920**

Statistical significance levels: * — 10%; ** — 5%; *** — 1%.

Source: Authors' original compilation.

4. Conclusions

The study verified the scale of the impact of the pandemic on the finances of holiday resort communes in Poland. It showed that the lockdown caused by the COVID-19 pandemic affected the finances of a typical Polish holiday resort commune located in the mountains more strongly than the finances of a typical holiday resort commune located at the seaside. Thus, the study supported the main hypothesis. Moreover, it showed that both types of holiday resort communes struggled with a relatively similar problem of significantly reduced budget expenditures, which confirmed the auxiliary hypothesis.

The study confirmed the results of previous analyses, including those of the World Bank (2021) and the Emergency Governance Initiative (2021), showing that in various countries around the world both the income and expenditure of communes had been reduced due to problems with the implementation of projects and the avoidance of too high budget deficits. The author of the study discussed the problem which so far had been omitted in scientific publications. The research showed that holiday resort communes

with similar socioeconomic structures could have been affected in a slightly different way by the COVID-19 pandemic due to the seasonal nature of tourism. This was the main reason why the global recession during the lockdown affected the commune located in the mountains more strongly than the commune located at the seaside.

Our investigations can be used as the introduction to further research on this important issue — analyses conducted on a larger number of communes and based on different methods. Problems of local governments in holiday resorts could be analysed on a wider scale, e.g. regional. There is no doubt that tourism has been strongly negatively affected by the lockdown. Therefore, research is necessary to prove that this sector has received due support from the state or that there have been errors in the government's policy, which need to be corrected. Our research led to the conclusion that although that holiday resort communes located in the mountains were affected by the lockdown more strongly, other holiday resort communes, whose finances had also been reduced, should receive support from the government as well, as recommended by the World Bank (2021). Decisions taken by the government could be more effective if they were preceded by analyses such as the one conducted in this study.

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Biographical note

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PART II
COVID-19 IMPLICATIONS — MACRO APPROACH

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The Stabilisation Policy and Its Macroeconomic Consequences During the COVID-19 Pandemic in Poland[1]

Abstract. When the COVID-19 pandemic began, the first infections occurred in Poland at the beginning of March 2020. Their multi-aspect consequences played a specific role in the economy. Although these processes were caused by a specific biomedical situation, the stabilisation activities implemented under such conditions should coincide with the actions taken during the period of changes in business activity, generated by economic factors. They require quick and adequate fiscal and monetary instruments. The aim of this study was to analyse and assess the fiscal and monetary tools applied in Poland in order to stabilise the macroeconomic situation during the COVID-19 pandemic, i.e. between March 2020 and June 2021. The analysis of the macroeconomic situation encompassed the phenomena and processes occurring in the real and the nominal spheres of Poland's economy. Special attention was paid to business fluctuations in the GDP series, investments, consumption, unemployment, inflation-induced changes and disturbances in the state budget. There are two parts of the study. The first part discusses the aims of stabilisation instruments used in market economies as well as the tools applied in anti-crisis shields. They were supposed to support Poland's economy affected by the consequences of the COVID-19 pandemic. The second part is an analysis of the macroeconomic effects of these measures under a limited amplitude of business fluctuations, unemployment, inflation, and the aggravating situation of the state budget.

Keywords: monetary policy, fiscal policy, pandemic, macroeconomic stabilisation

JEL classification: E30, E31, E32, E52, E62

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Introduction

In December 2019 the COVID-19 epidemic broke out in Wuhan, China. The Sars-CoV-2 virus spread around the world very quickly. In early March 2020 the first cases of the epidemic were recorded in Poland. The COVID-19 pandemic had multi-aspect consequences, especially in the economy, which declined deeply. Although the genesis of this breakdown was exogenous and resulted from biomedical conditions, the stabilisation measures should coincide with the steps taken during the period of changes in business activity, generated by factors resulting from the economic system.

The aim of the article was to analyse and assess the tools applied in the fiscal and monetary policy in Poland in order to stabilise the macroeconomic situation during the coronavirus pandemic. The article consists of two parts. The first part discusses the aims and instruments of the stabilisation policy. It also describes the monetary and fiscal stabilisation tools which were applied in anti-crisis shields introduced to counteract the negative effects of the coronavirus epidemic on the economy in Poland. The second part analyses the measurement of the effectiveness of these stabilisation tools. The study concludes with an assessment of the effectiveness of stabilisation measures undertaken so far in the nominal and the real spheres of Poland's economy.

1. Aims and tools of macroeconomic stabilisation policy in market economies — review of scientific publications

The stabilisation policy is an important task for state institutions. This policy includes all the measures whose aim is to create and maintain the conditions of general economic equilibrium, i.e. to counteract or mitigate the impact of short-term and medium-term changes in economic activity. A stabilisation policy is not meant to prevent any kind of economic fluctuations, but it should ensure that they cancel each other out rather than reinforce each other (Despres et al., 1975). The main goal of a stabilisation policy is to achieve market equilibrium. However, it does not only mean a general equilibrium between the effective demand and total supply in the goods and services market, with the preservation of the partial equilibria. A stabilisation policy is also supposed to neutralise the effects of cumulative processes in the economy so as to maintain a high economic growth rate, counteract excessively deep breakdowns as well as affect the growth dynamics and proportions in the supply of factors of production (Barczyk, 2004). The main goal formulated in this way refers to the ideal state with the optimal situation in the economy. However, when the stabilisation policy is brought closer to the economic reality, we can say that its goal in the market system is to achieve a high and sustainable

economic growth, a high employment level, a stable value of money and, in an open economy system — balance in international relations. In this way, the quadrilateral of stabilisation goals was formulated. It is frequently supplemented with additional goals, such as fair distribution of the national income and capital, ecological sustainability (Mussel & Pätzold, 2012), and a balanced state budget (Kołodko, 1993).

Regardless of the assumed conception of the stabilisation policy goals, in practice, the implementation of the stabilisation process is hampered mainly for two reasons:

- stabilisation policy goals are interrelated and some of them have the trade-off nature (one thing in return for another),
- the stabilisation policy is a kind of conglomerate of different types of economic policy (Urbanowicz, 2014, p. 251).

Trade-off makes it impossible to accomplish all stabilisation policy goals simultaneously. Achieving one of the goals creates an opportunity cost, i.e. resignation from the accomplishment of another goal. For example, a higher rate of economic growth may contribute to higher employment, but at the same time, it will increase inflation, as indicated by the Phillips curve, defined by Akerlof as "probably the single most important macroeconomic relationship" (Mankiw & Taylor, 2009, p. 372). A negative slope of the Phillips curve in the short run excludes the possibility to simultaneously achieve price stability and full employment, which indicates the substitutability of those two goals[2]. This conclusion gave rise to a dilemma concerning the stabilisation policy. According to some economists, the course of the Phillips curve in the short term indicates that reduction of unemployment by means of monetary expansion is possible at the price of only a moderate increase in inflation (Godłów-Legiędź, 2005). However, Friedmann (1968) proved that in the long term the Phillips curve was vertical. This means that the achievement of equilibrium in the labour market by means of monetary expansion is impossible and dangerous because in the long run it will only end in higher inflation (Hübner, 1992; Winniecki, 1986; Welfe, 1993; Pollok, 2000).

Moreover, the stabilisation policy is primarily a set of tools applied in monetary and fiscal policies as well as exchange rate, income, and supervisory policies (Urbanowicz, 2014). For this reason, it is a problem to coordinate decisions made by various institutions responsible for specific areas of state interventionism. Each of the aforementioned policies has its own, specific, primary goals which can be directly referred to individual goals of the stabilisation policy (Przybylska-Kapuścińska, 2008). In accordance with the trade-off phenomenon, the implementation of the primary goals of individual types of

[2] For more about the Phillips curve see: (Phillips, 1958; Samuelson & Solow, 1960; Blaug, 2000; Bludnik et al., 2009; Bludnik, 2010).

the economic policy may, or may not, indirectly foster the achievement of the other goals of the stabilisation policy. Therefore, the problem of coordination of decisions taken as part of the stabilisation policy should also be considered in the context of the hierarchy of importance of the tasks to be accomplished (Urbanowicz, 2014). The main goal of the monetary policy is to stabilise prices. The main goal of the fiscal policy is to maintain taxes at the level optimising the rate of growth and satisfying the financial needs of the state. The fiscal policy has far-reaching goals, touching on economic aspects as well as social and demographic aspects related to them. Moreover, the monetary policy goals are incorporated in highly important legal acts, whereas the goals of the fiscal policy in its broad sense are not precisely defined and may be changed when the government changes. Both the monetary and the fiscal policy are pillars of the economic policy. Therefore, they should be coherent, well-coordinated and implemented in an uninterrupted manner. Unfortunately, sometimes the government's fiscal policy is in disagreement with the monetary policy. Moreover, the government sometimes exerts a political pressure on the monetary policy, which has to co-exist with the goals that are competitive to stability, i.e. an increase in output or reduction of unemployment. The shaping of the national policy mix, which is a combination of the monetary and fiscal policies, is not an easy task (Przybylska-Kapuścińska & Szyszko, 2017).

The following fiscal instruments are used as stabilisation policy tools (Owsiak, 2005, p. 361):

- budget expenses on goods and services,
- dynamics and structure of transfer expenses,
- changes in the tax policy.

The public spending policy plays a significant stabilising role because it directly determines changes in the demand not only for consumer goods but also for investment goods. Changes in the consumer demand are conditioned by personal and social spending and, partly, by transfer expenses. The demand for investment goods is shaped by material budget expenditures and subventions. This influence is more direct, because no savings are generated to modify the investment demand. However, the stabilisation policy encounters some barriers in this case, too (Pätzold, 1991). Transfers to individual business entities are also a component of budget expenditures which stabilise the economy. This instrument of the fiscal policy is more flexible to operate than investment expenditures. However, the possibilities to increase them are restricted by the situation in the state budget.

In the market economy the tax policy used as an instrument of stabilisation is oriented at the income of consumers and investors, or at their business activity. However, its influence on consumers' income is indirect and can be exerted through additional tax

burdens or exemptions, or through changes in tax rates on consumer goods, e.g. VAT or excise tax. State bodies may also use the tax policy to influence the demand for investment goods. Investment bonuses are an important tool used in this area. Non-permanent investment bonuses cover only profit-making firms, whereas permanent bonuses cover all businesses, regardless of their financial outcome. The state may also allow investment funds in enterprises as part of the tax policy. Investment funds are created from the profit and accumulated in special accounts to be used at the time of low business activity (Teichmann, 1988)[3].

The second group of stabilisation policy tools comprises monetary policy instruments. The most important of these instruments in Poland are (The National Bank of Poland Act of 29 August 1997, 2005, item 938):

- open market operations,
- deposit and credit operations,
- minimum (required) bank reserve.

The National Bank of Poland uses the aforementioned instruments to determine the interest rates which will maximise the probability of reaching the assumed inflation target. Communication between the central bank and other institutions plays an important role in the contemporary monetary policy. Transparent communication under forward guidance is supposed to shape the expectations of market participants and accelerate the transmission of monetary impulses to the economy.

Since the 1990s the new neoclassical synthesis has been the theoretical basis for the stabilisation policy. This trend is based on the assumption that the inflation target is a priority. This means that other stabilisation goals can be supported to an extent which does not interfere with the achievement or maintenance of price stability. For this reason, the monetary policy is attributed the dominant role in the stabilisation policy. The 2007 crisis revealed on a global scale that standard monetary policy instruments were unable to effectively overcome the negative consequences of the collapse of economies. This was reflected by the lack of the expected effects of drastic cuts of interest rates. Liquidity on the interbank market did not improve nor did the lending activity of commercial banks increase. Due to the ineffectiveness of traditional monetary policy instruments, central banks were forced to loosen the monetary policy solutions they were using by applying

[3] Neck et al. (2021) researched the effectiveness of budget expenditures in stimulation of the economy in a case study of Slovenia. They proved that budget expenditures affected both the demand and supply. They were particularly effective in stimulating the real GDP and increasing employment, as compared with the expenditures which affected the demand only. This is due to the fact that operations affecting the supply increase not only the real but also the potential GDP. Expenditures on research and development as well as funds spent on the improvement of qualifications of workforce proved to be particularly effective. Moreover, the research showed that employment could be effectively stimulated by reducing income tax rates and social insurance premiums.

quantitative and qualitative easing, i.e. they had to use non-standard tools in the monetary policy (Przybylska-Kapuścińska, 2012)[4]. In the face of the limited effectiveness of monetary policy, large-scale fiscal stimulus packages were also introduced in most countries in the world, which largely contributed to reversing the effects of the crisis. These events were accompanied by a noticeable change in the assessment of the effectiveness of the monetary and fiscal policies in the post-crisis stabilisation (Urbanowicz 2014; Gajda-Kantorowska, 2011).

When the pandemic started, it turned out again that the monetary policy tools alone would not be able to stop the negative economic effects (especially when combined with the low interest rates). The heads of the largest central banks demanded again that the economies should be supported by higher budget spending. The independence of central banks from political influence was to guarantee that inflation would be kept low. The introduction of the 'inflation-safe' fiscal policy by the governments of individual countries was supposed to ensure the introduced prudential thresholds within the budget deficit and public debt (The Economist, 2020). However, although the struggle with the consequences of the financial and economic crisis in 2007 by means of a strong monetary and fiscal expansion did not result in increased inflation, this risk appeared during the pandemic[5].

2. Macroeconomic stabilisation policy tools applied in Poland during pandemic

After the end of the global crisis Poland's economy reached the trough point in the first quarter of 2013. This initiated the phase of high growth dynamics in the business cycle. The growth phase came to an end in the second quarter of 2019, because the GDP and consumption dynamics reached the maximum values then. The maximum dynamics of investment activity had ended two quarters earlier.

In the first quarter of 2017 the prices of goods and services started to increase slowly, whereas the unemployment rate was decreasing until the third quarter of 2019. At the end of the first quarter of 2020 the first coronavirus infections were recorded in Poland. The government introduced a lockdown and started to prepare and implement anti-crisis shields in order to curb the negative consequences of the pandemic in the economy.

[4] For more information see: (Kołodziejczyk, 2012).

[5] The pandemic sparked a discussion on its effect on economic theory, including the economic policy. For more information see: (Banaszyk et al., 2021; Bonatti, Fracasso & Tamborini, 2020).

2.1. Anti-crisis shields and financial packages

Anti-crisis shield 1.0 was a package of government acts approved in early March 2020 to protect Poland from the crisis caused by the coronavirus pandemic. The shield was based on five pillars (COVID-19 Prevention, Counteraction, and Combat Act of 31 March 2020, 2020, item 568):

- job security and employees' safety (maximum expenses of 30 bn zlotys),
- business financing (maximum expenses of 74.2 bn zlotys),
- health protection (maximum expenses of 7.5 bn zlotys),
- strengthening of the financing system (maximum expenses of 70.3 bn zlotys),
- public investments (maximum expenses of 30 bn zlotys).

The first shield was to stabilise the economy and give it an investment impulse, with the total expenditure of approx. 212 billion zlotys (10% of Poland's GDP). The support provided under this shield amounted to:

- the government cash component — 67 bn zlotys,
- the government liquidity component — 75.5 bn zlotys,
- the NBP liquidity package — approx. 70 zlotys.

The first pillar of the shield provided:

- wage subsidies in case of threatened jobs, stoppage, or reduction of workload,
- assistance to the self-employed, employees working under specific task contracts or fee-for-task agreements (80% of the minimum remuneration),
- additional carer's allowance for children up to 8 years of age,
- bank loan repayment deferral by 3 months.

The second pillar of the shield covered the financing of enterprises and provided:

- non-returnable loan for businesses maintaining permanent employment,
- automatic revolving credit,
- loan guarantee programme for micro- , small, and medium-sized businesses,
- Capital for Security and Growth of the Polish Development Fund (PFR).

The third pillar covered health protection and supported the health service by:

- combating the coronavirus,

- creating new information channels in the health service,
- building a medical infrastructure,
- digitisation of the healthcare system.

The next pillar strengthened the financial system. It consisted of two packages:

- the regulatory package of the Polish Financial Supervision Authority (KNF) and the Ministry of Finance (MF) (the package included lower capital buffers or recommendations of the Financial Stability Committee and reduced the requirements for banks' capital or liquidity),
- the NBP financial package to improve the liquidity of banks, lower the base interest rates and the required reserve rates.

The last pillar of the shield covered public investments. The Public Investment Fund was used to develop the infrastructure, modernise schools and hospitals, for energy and digital transformation, biotechnology, pharmaceutics, and environmental protection.

Individual business entities showed some distrust when shield 1.0 was introduced. They were particularly concerned about the organisation, forms and scope of assistance, as well as the amount of cash benefits. Therefore, in April 2020 the government prepared shield 2.0. The most important solutions approved in this package included greater financial assistance for the self-employed, employees working under specific task contracts or fee-for-task agreements. The period of additional carer's allowance paid to parents with children under 8 years of age was also extended. Moreover, another allowance was introduced for parents under obligatory quarantine, epidemiological surveillance or hospitalisation. The system of social assistance for people remaining in isolation due to a suspected infectious disease or total incapacity for work was simplified. The validity of certificates of total incapacity for work was extended. The payment deadlines of perpetual usufruct fees and the transformation of perpetual usufruct into ownership were shifted.

Nevertheless, all those solutions were still insufficient for some business entities. Therefore, they were modified and another two shields with new solutions were introduced, i.e. shield 3.0 in May 2020 and shield 4.0 in June 2020.

Shield 3.0 altered 47 acts, including:

- conditions for receiving stoppage allowances,
- extension of the conditions of paying insurance premiums to the Polish Social Insurance Institution,
- conditions for receiving micro-loans.

The following solutions were included in Shield 4.0:

- interest rate subsidies on bank loans,
- simplified restructuring procedures,
- rules for remote work,
- supervision over the takeover market transferred to the President of UOKIK (Competition and Consumer Protection Office).

The stabilisation measures also included a financial shield, which was a part of the anti-crisis shield, implemented by the Polish Development Fund. The financial shield was addressed to microenterprises (employing 1–9 people), small and medium-sized enterprises (10–249 employees) and large businesses (with over 250 employees) to secure employment. The amount of money allocated to this project was nearly 100 billion zlotys, including up to 60 billion zlotys as non-returnable support.

Subventions for microenterprises (maximum 25 billion zlotys) were planned. The maximum sum paid could not exceed 324,000 zlotys. The amount of support depended on the decrease in income and the number of employees (70,000–90,000 zlotys on average). It was assumed that 75% of the subvention could be non-returnable and 25% should be returned if the enterprise continued operating for 12 months after receiving the support. Moreover, an extra 50% could also be non-returnable if the enterprise maintained its average employment for 12 months. The remaining amount of the subvention needed to be repaid within 5 years. The financial aid could be used to pay the costs of the company's activity, especially to pay salaries, whereas 25% could be earmarked for the earlier repayment of the loan.

The maximum value of the programme for small and medium-sized enterprises was set at 50 billion zlotys. The amount of non-returnable funds was 32 billion zlotys. 75% of the subvention was non-returnable, where 37.5% depended on the loss in sales and the other 37.5% was earmarked to maintain the current employment for 12 months. The subventions were 4%, 6%, or 8% of the yearly sales, whereas the maximum amount was 3.5 billion zlotys (19 million zlotys on average).

The maximum amount of financial support for large enterprises employing over 250 people was 25 billion zlotys, including 12 billion zlotys of non-returnable funds. The following three forms of the financing were possible:

- liquidity financing (two-year loans or bonds, up to 1 billion zlotys),
- preferential financing (three-year loans, partly non-returnable, depending on the amount of the financed loss and the maintenance of employment, up to 750 million zlotys per entity),
- investment financing — capital instruments in the enterprise which the state can overtake as shares on the stock exchange or as public assistance, up to 1 billion zlotys per enterprise.

During the second wave of coronavirus, further stabilisation solutions were approved in Poland, i.e. the sectorial shield of the Ministry of Development, Labour, and Technology, as well as anti-crisis shields: 5.0 in September 2020, 6.0 in December 2020, and 7.0 on 28 February 2021. In January 2021 the Polish Development Fund approved financial shield 2.0 to support 38 branches of the economy with 35 billion zlotys. All those solutions were mainly addressed to microenterprises and small enterprises, which were exempt from paying insurance premiums to the Polish Social Insurance Institution, received additional one-off stoppage benefits, and a subsidy of 5,000 zlotys. Apart from that, the regulations extended the number of economic sectors which could apply for financial support from the state.

Due to the ongoing coronavirus pandemic, on 28 February 2021 shield 8.0 was launched. It was addressed to enterprises in specific branches, which were affected by pandemic restrictions. Shield 8.0 prolonged and extended shield 7.0 and provided the following support:

- employment security benefits,
- successive stoppage benefits,
- subsidies to cover the running costs of business,
- exemptions from paying social insurance premiums.

On 26 April 2021 shield 9.0 was launched — the aid provided by the state was extended over 16 new branches. Moreover, starting from 4 May 2021 applications could be submitted for exemptions from insurance premiums for March and April 2021. This solution also offered employment security benefits and subsidies to cover the current costs of running a business.

As results from the analysis of the stabilisation programmes implemented in Poland's economy during the COVID-19 pandemic, their primary aim was to prevent the rapid growth of unemployment, i.e. to reduce the increase in the dynamics of supply disequilibrium on the labour market. At the same time, the shields were introduced to improve the financial situation of individual entities, curb the dynamics of decrease in the disposable income of consumers, especially those losing their jobs, raise the liquidity of enterprises and reduce the rate of their bankruptcies. Those measures were applied to slow down the GDP decline rate. Other stabilisation aims were not formulated, especially those regarding inflation, state budget result or macroeconomic equilibrium in international relations.

The programmes were mainly based on fiscal tools, such as increased expenditures on subventions for consumers, investments in the public sector, and health protection, especially to combat the coronavirus. This means that much less attention was paid to the income part of the budget, which led to a rapid growth of the budget deficit and increased the public debt. The instruments used by the central bank to lower interest

rates and guarantee credit operations of commercial banks were much less important. This bank paid relatively less attention to the implementation of the anti-inflation policy.

Individual economic entities often negatively responded to the implemented legislative solutions because they were incomplete and delayed. The financial support was insufficient, especially when compared with the other EU member-states. These opinions about the stabilisation activities were confirmed by frequent modifications of the approved legislation.

2.2. Methods of analysis of accomplishment of selected stabilisation aims in Poland during pandemic

The accomplishment of the stabilisation aims during the pandemic in Poland was analysed against a longer period of time, i.e. from the first quarter of 2003 until the second quarter of 2021. The following indicators from the nominal and the real sphere were selected from the available time series showing the measurable effects of macroeconomic stabilisation:

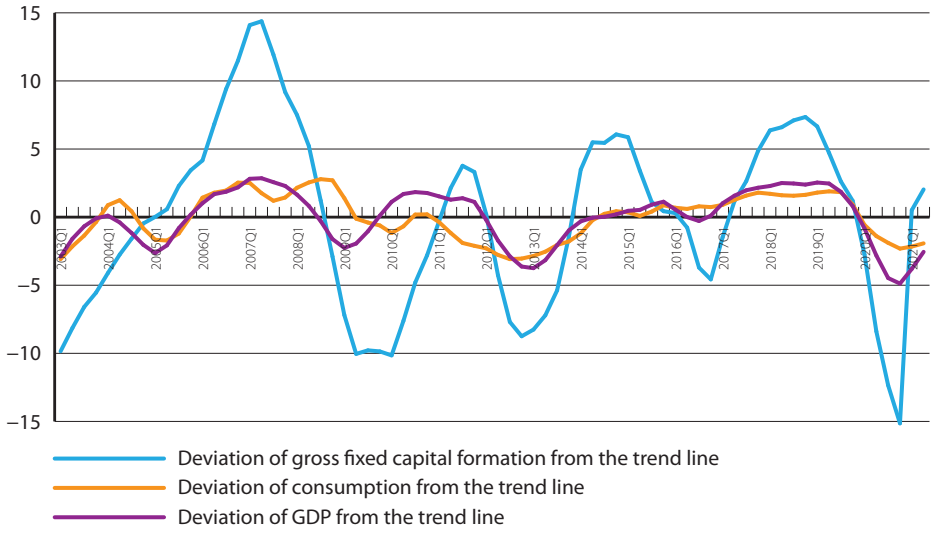
- indexes of the GDP dynamics, consumption, and gross fixed capital formation in constant prices on a quarterly basis (analogical period of the previous year = 100) — they show the process of economic growth and business fluctuations,
- quarterly data of registered unemployment rates, whose changes indicate disequilibrium in the labour market,
- indexes of the dynamics of prices of consumer goods and services on a quarterly basis (analogical period of the previous year = 100) — they show the extent to which the NBP inflation target was accomplished,
- public debt indexes in relation to the GDP on a quarterly basis — they show the indebtedness of Poland's economy[6].

The analysis of time series should be based on correctly prepared empirical data. Due to this fact, the source material broken down into quarters was decomposed. The TRAMO/SEATS procedure, recommended by the Eurostat, was applied to remove seasonal and random fluctuations from the initial series of data, i.e. indexes of dynamics in the GDP, consumption, gross expenditures, unemployment rates and inflation (Gomez & Maravall, 1996). Next, the direction of changes was determined for the series of GDP, consumption, expenditures and unemployment by means of trend line estimation. Then, deviations of the empirical values from their trend line were calculated for these time

[6] For this indicator, the analysis covered a period from the first quarter of 2003 to the first quarter of 2021 due to the unavailability of data for the second quarter of 2021 at the time the article was being written.

series. Deviations of the inflation index from the inflation target of 2.5%, set by the NBP, were estimated. For the public debt in relation to the GDP, its deviations from the EU public debt prudential threshold (i.e. 60%) were calculated. These calculations were used to assess the stabilisation processes in the areas of economic growth (Figure 1), labour market and inflation (Figure 2), and indebtedness (Figure 3).

Figure 1. Deviations of the indexes of the GDP, consumption, and gross fixed capital formation from the estimated trend line in Poland between the first quarter of 2003 and the second quarter of 2021

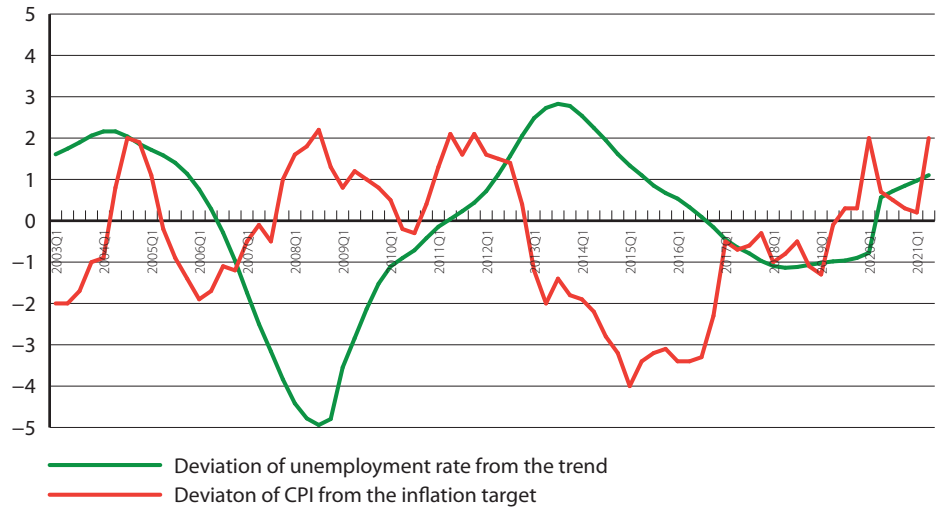


Source: Authors' calculations (the GRETL program) based on data from the Central Statistical Office (GUS).

The analysis of Figure 1 showed that during the period under study the economic growth in Poland was progressing in a relatively stable manner. Although the graph shows fluctuations in the deviations, their increases or decreases were within a certain fluctuation band, i.e. they were neither violent nor stifled. However, during the coronavirus pandemic there was a noticeable downturn. The consumption and investments decreased, too, but the latter declined much more. The data proved that the assistance programmes offered by the government did not sufficiently support the investment activity, but they mostly maintained the consumer demand in Poland's economy. However, this tendency changed in the first six months of 2021. Deviations in all of the three indexes increased, with the highest growth in gross capital formation. This may have been caused by entrepreneurs' optimism, who saw a smaller number of COVID-19 infections and deaths, as well as by optimistic prognoses that the third wave of the coronavirus pandemic in the economy would soon come to an end. However, it is always necessary to think whether such expectations are justified and how long they can be maintained.

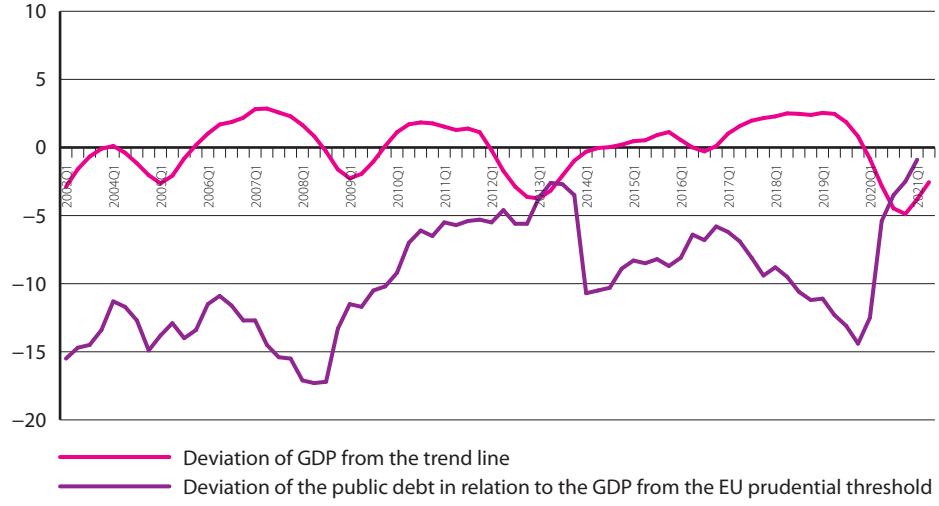
Near the end of the second quarter of 2021 there were increasing fears concerning the time, force, and duration of the fourth wave of COVID-19.

Figure 2. Deviation of the unemployment rate from the trend and deviation of the CPI from the inflation target in Poland between the first quarter of 2003 and the second quarter of 2021



Source: Authors' calculations (the GRETL program) based on data from the Central Statistical Office (GUS)

Figure 3. Deviation of the GDP index from the trend line and deviation of the public debt in relation to the GDP from the EU prudential threshold in Poland between the first quarter of 2003 and the first quarter of 2021



Source: Authors' calculations (the GRETL program) based on data from the Central Statistical Office (GUS) and Eurostat

Figure 2 shows progressive stabilisation of the labour market. Fluctuations in employment rates seemed to be stifled, i.e. they were decreasing. As results from the data on the labour market, there were not large imbalances during the pandemic. This may have been caused by the fact that the support the government provided with the anti-crisis shields was conditional, i.e. it was obligatory to maintain the current level of employment. This fact was confirmed by the results of the report provided by the SGH Warsaw School of Economics and the Economic Forum (2022). Its authors indicated the relative effectiveness of the economic policy, which between 2020 and 2021 secured employment in Poland and other countries of Central and Eastern Europe (Bulgaria, Croatia, the Czech Republic, Estonia, Lithuania, Latvia, Romania, Slovakia, Slovenia, and Hungary)[7]. As regards inflation, the graph shows alternating periods of deviation beyond the allowed fluctuation band approved by the NBP. The NBP set the inflation target at 2.5%, with a possible deviation of 1%. This means that the target was achieved if the inflation ranged between 1.5% and 3.5%. The graph shows price index deviations from the level of 2.5%. If the graph was a straight line, at the 0 level, or if the deviations were ± 1 p.p., this would indicate that the target set by the NBP was accomplished. However, there were alternating periods of stronger deviations beyond the permissible limit. Nevertheless, the amplitude of these deviations was not very high. This means that throughout the whole period under analysis, including the initial period of the pandemic, the inflation level was not higher than that of creeping inflation, which is relatively safe for economic stability. Nonetheless, some economists expressed their concerns due to the relatively high dynamics of prices, while the central bank decided to maintain interest rates at a low level. Simultaneously, the Polish government declared to continue this expansionary policy and supported the economy with the money from both the national and the EU budget. Unfortunately, recent data seem to confirm those concerns because since the beginning of 2021 prices have been growing at a noticeably higher rate[8]. Despite this noticeable growth of prices, the NBP (at the time this article was being written, i.e. in September 2021) did not raise interest rates to restrain the possible further growth of prices. They argued that the main cause of inflation in Poland was the growing prices of energy, which could not be influenced by the policy of the central bank. This graph seems to confirm the conclusions resulting from the course of the short-term Phillips curve, i.e. that an expansionary monetary policy may help the labour market at the expense of moderately higher inflation in the economy. The question when the 'short' term will come to an end remains unanswered. It is also uncertain whether the prolonged maintenance of too

[7] For more information on the assessment of the macroeconomic situation of Poland against other EU member-states, see: (Gorynia & Polowczyk, 2022).

[8] These concerns were also expressed in the report provided by the SGH Warsaw School of Economics and the Economic Forum (2022, p. 22). At the time Poland was among the EU member-states with the highest growth of prices.

expansionary monetary and fiscal policies will not result in stepping or even galloping rather than moderately high inflation, which would have an unfavourable impact on the labour market.

The results of some studies showed that the strongly expansionary fiscal policy of the governments of individual countries could be blamed for the rising inflation during the pandemic. By contrast, since the beginning of the financial and economic crisis the governments of other countries with developed economies have been implementing a soft monetary policy, which did not interfere with the achievement of their inflation targets. Only the exceptionally strong fiscal stimulus during the pandemic caused price spikes (Banerjee et al., 2022; The Economist, 2021).

The last graph helps to assess the indebtedness in Poland's economy, which increased due to the need to combat the consequences of the COVID-19 pandemic. As can be seen, there were deviations of the indebtedness index from the EU prudential threshold, which is equal to 60% of the GDP. If the graph was a straight line at the 0 level, the indebtedness would be equal to 60% of the GDP. Its swings above the 0 level would indicate higher indebtedness than the obligatory 60% threshold, whereas swings below the 0 level would indicate fulfilment of the EU requirements concerning the level of indebtedness. As can be seen, throughout the whole period under analysis Poland did not exceed the 60% threshold of debt in relation to the GDP. In order to facilitate interpretation, the course of the public debt was presented against the course of GDP deviations from the trend line. As can be seen, the positive GDP deviations from the trend, i.e. the periods of accelerated growth, were accompanied by a decrease in indebtedness and vice versa. This tendency was particularly distinct during the period of struggle with the consequences of the global financial and economic crisis (the indebtedness started to increase in the second half of 2008) and during the struggle with COVID-19 (a marked growth of indebtedness at the end of 2019). However, during the latter crisis the indebtedness grew higher, i.e. it was closer to the prudential threshold, than during the former one[9].

The increasing prices and indebtedness in Poland's economy combined with low interest rates seem to be particularly dangerous. The increased indebtedness of the Polish economy caused by combating the consequences of COVID-19 was nothing unique on the international arena. In consequence of the pandemic, fiscal assistance programmes launched by governments caused the global debt to increase by about 15 p.p. in relation to the global GDP between 2019 and 2021 (Banerjee et al., 2022). The high increase in debt raised the concern of some economists, who warned governments of a growing threat to the maintenance of price stability in the future (Summers, 2021). Others reassured them saying that if prices started to increase, the problem could be solved by changing the

[9] For a detailed analysis of the course of indebtedness in Poland during the COVID-19 pandemic see: (Jarosz, 2022).

monetary policy from expansionary to restrictive (Krugman, 2021). These consequences of the COVID-19 pandemic can be fully assessed only in the future, as the fight against its negative economic effects does not seem to have finished (Kołodko, 2021; Kowalski, 2021; Christl et al., 2021).

Conclusions

The stabilisation policy implemented in Poland's economy during the COVID-19 pandemic only partly converged with the actions taken during changes in the phases of the business cycle. The similarity is fragmentary because neither fiscal nor monetary tools directly influence the genesis of economic breakdown, which has exogenous nature. These actions only indirectly determine the sources of decline, as they focus on economic effects and measures to combat them.

The main aim of the stabilisation measures implemented during the economic breakdown was to maintain equilibrium in the labour market. They only indirectly focused on the fair distribution of GDP, i.e. guaranteeing income to consumers, especially those losing their jobs. The state authorities attempted to reduce the dynamics of decline in business activity, but they practically did not take any significant action to restrain the dynamics of inflation, maintain ecological balance, or appropriately develop international relations.

Poland's economy was dominated by fiscal tools related to the budget expenditure policy, whereas the taxation policy was much less significant. As a result, the budget deficit and public debt increased. Unfortunately, the expenditure policy mainly determines the dynamics of consumption, whereas capital expenditures are affected to a much lesser extent. The state bodies practically did not create conducive conditions to the private sector to increase investments by reducing economic, political, and social risks.

During the coronavirus pandemic monetary policy instruments seemed to be less important. The central bank strived to facilitate the lending activity of commercial banks by reducing interest rates, increasing the money supply in the market, and extending the credit guarantee system, but paid relatively less attention to the implementation of the anti-inflation policy. The stabilisation actions taken to support the economy in Poland were incomplete and delayed. The absolute values of the financial support were too low, especially when compared with the support provided in the other EU member-states. This fact was proved by numerous amendments to legal acts.

Braunerhjelm (2022) noted that a traditional stabilisation policy may indeed mitigate fluctuations in business activity, but above all it influences aggregate demand. However, according to the researcher, such measures are insufficient to mitigate the effects of the COVID-19 crisis, which affected both the demand and the supply. Moreover, when the pandemic broke out, the monetary policy in many countries was at or close to a li-

quidity trap. Thus, the burden of stabilisation was shifted to the fiscal policy, but the actions were taken in an ad hoc and often experimental manner.

It is difficult to unambiguously assess the stabilisation instruments applied in Poland during the pandemic. The occurrence of COVID-19 and the economic consequences of this disease should induce revision of the origins of factors destabilising the economic system. New macroeconomic stabilisation goals should be adopted, e.g. a broader approach to the nominal sphere and more flexible tools of the monetary and fiscal policies.

Some authors expressed the opinion that the stabilisation policy should include measures strengthening entrepreneurship, broadening knowledge, the development of companies and their innovativeness. Corporate taxes should be used to increase the resilience of enterprises to crises, increase investment and encourage start-ups. The state should provide support on condition that workers are committed to broaden their knowledge. If such actions are taken at the microeconomic level and supported by the macroeconomic stabilisation policy, they can more effectively level the fluctuations of the business cycle, increase the potential for long-term growth and facilitate the restructuring of the economy, which usually follows a crisis (Braunerhjelm 2022).

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China-United States Trade in the Long Term. Implications for the World Economy

Abstract. The aim of this chapter is to present the historical paths and determinants of the development of China (P.R.C.)-United States (U.S.) trade against the background of their bilateral relations. The essay discusses the origins and consequences of China's opening up and then moves forward to consider the evolution of its trade relations with the U.S.. This encompasses China's accession to the WTO, implications of the 2007/8+ global financial crisis for these relations, as well as the global impact of the COVID-19 pandemic. This discussion is accompanied by an analysis of the political environment that led to the opening of China's economic relations with the U.S. in 1978, including earlier political contacts and negotiations. Evolution of the China-U.S. trade balance, the growing P.R.C. export surplus as well as P.R.C. and U.S. trade policies are then considered as the source of increasing global current account imbalances and, consequently, the trade war between these two countries. The 2019–2021 sub-period has also been scrutinised to highlight the global economic effects of COVID-19 and its impact on international trade as well as P.R.C.-U.S. bilateral economic relations. The discussion in this essay is presented within a framework of the four following interrelated issues: the process of the opening up of the Chinese economy and the role of America, sources of international payment disequilibrium, the China-U.S. trade war, and the impact of COVID-19 on international and U.S.-China trade. It concludes with the key role of multilateral cooperation as a crucial factor to fight growing protectionism in international trade.

Keywords: China (P.R.C.), United States (U.S.), world economy, international trade, trade policy, trade balance, market transformation, international payment disequilibrium, COVID-19, trade war

JEL classification: F13, F21, F41, F51, O19, O24, P33

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1. Introduction

To understand China — U.S. long-term trade relations, including the COVID-19 period and trade war, their analysis must be put in a historical context. This requires taking a broad perspective on long-term trends in China-U.S. economic relations, acknowledging the key role that the U.S. has played in the development of China's economy and foreign trade after 1978, including China's accession to the WTO.

Furthermore, more recent developments, and in particular the U.S.-China Economic and Trade Agreement concluded in February 2020, require attention as their protectionist nature can be regarded as a factor limiting the further development of China-U.S. trade

relations. This could also affect their WTO trade partners. These historical as well as more recent events set the stage for viewing the effects of COVID-19 on China-U.S. trade relations.

This chapter, both in its theoretical and empirical layers, mainly applies the analytical-descriptive method, but also uses the normative when the author shares his conclusions and opinions. Comparative analysis was used in commenting on the historical path of China's development, its long term economic relations with the U.S. economy and their implications for the global economy. This was done bearing in mind political factors and the changing geopolitical environment.

The focus of the analytical section is predominantly on trade in goods, as this plays a key role in the build-up of China's export surplus, which consequently leads to a widening of the international payment disequilibrium. Therefore, the bilateral trade balance and the factors shaping it in the long term are analysed. It is argued that its growing imbalance in favour of China has substantially contributed to international imbalances of payments and consequently to the P.R.C.-USA trade war.

While theoretically and methodologically the chapter is located in the area of international economics, application of an interdisciplinary approach and analysing how changing patterns of global political relations increasingly affect international economic relations is the key contribution of this chapter. In this context, the author builds on prior research on the opening mechanism of the Chinese economy, the specifics of its market transformation, theoretical and practical aspects of international payment imbalances as well as factors and determinants of China-U.S. economic relations within the changing pattern of the world economy and global political environment.

2. China's departure from the autarkic development model

Defining the economic essence of opening up the economy in the process of transformation, in this case China's, and considering the open development strategy it pursued within this framework, requires prior reference to the autarkic economy model, specific to a planned economy. As a criterion distinguishing these two models, the presented concept of opening up the economy adopts foreign trade functions, respectively, *passive* for the autarkic model (essential imports *vs.* exports of surpluses) and *active* for the open model in which import becomes a factor adjusting the structure of national income to the needs of economic development, and export serves to discount the benefits of the economies . In the case of China, this results in a corresponding shift in trade balance from an import surplus to an export surplus. This is accompanied by the accumulation of foreign exchange reserves (Starzyk, 2009).

The autarkic model of development resulted in extensive development of the Chinese economy until the end of the 1970s, without its integration into the international divi-

sion of labour, while taking into account criteria of international specialisation based on Ricardian comparative cost theory, and through the use of the appropriate foreign economic policy tools to stimulate and rationalise foreign trade flows. Flows of production factors were virtually non-existent. Capital imports were rare and only took place in the form of investment loans granted by socialist countries, especially the USSR (until the end of the 1960s).

In such a model, also typical for the other communist planned economies, there is no assumption of an economically justified relationship between internal prices and export and import prices, which distorts the accounting of foreign trade efficiency. The problem has already been pointed out by Szczepanik, author of the first scientific analysis of China's balance of payments. This analysis shows that the part of the balance of payments for 1950–1960 that is best documented by Chinese statistics is the balance of trade in goods divided into market economies ("Non-Communist countries") and planned economies ("Communist Countries"). In 1950–1952, China's trade with the former was virtually balanced with a negligible export surplus. In 1950, a small export surplus in trade with the United States, Canada and Western Europe helped to offset the negative balance of trade with other East Asian countries. Interestingly, Szczepanik begins his analysis, finished in 1962, with a thesis treating China as a developing country (Szczepanik, 1962, p. 113).

The objective of the import function, and this is where the analysis of the autarkic economy model should start, is to reduce purchases of goods necessary for the internal market, while the objective of the export function is to balance imports through the sale of production surpluses. The possibility of using imports as a stimulus for the industrialisation of the economy and discounting benefits of increasing scale of production through exports is therefore not assumed. Thus, there is no component in this model regarding the transformative function of foreign trade enabling an adjustment of national income in relation to the developmental needs of the economy. In addition, no assumption has been made regarding the efficiency function of foreign trade, externalized in value added in the form of growing supplies of goods and services increasing the international competitiveness of the economy (Starzyk, 2009).

The Chinese economy operated according to the autarkic model from the creation of the P.R.C. in 1949 until the political opening in 1978, which is regarded as the beginning of China's economic transformation. Its initiating impulse was an economic opening coupled with a political one, accompanied by a new accessibility to trade with the U.S. and other capitalist countries.

It should be emphasised that the beginning of the Chinese market transformation is directly dependent on political factors. The 3rd Chinese Communist Party Plenum held in December 1978, which announced a programme for the modernisation of the economy, opening up to the world and allowing the entry of foreign investment, was

a political and economic turning point in China (Starzyk, 1988). The political decisions of this plenum marked a fundamental shift in China's geopolitical concept of international economic relations. The political preference for Third World countries was abandoned and replaced by the development of economic relations with all countries irrespective of their political system, with all the economic benefits that derive from an open economy, with no consideration of ideological or political conditions in mind (Starzyk, 1987).

The key factor that accelerated China's economic transformation was establishing political relations with the U.S. The visit of the U.S. president, Richard Nixon, to China in February 1972 was a turning point in the then political situation of both countries, which was generally characterized by mutual distrust. On the one hand, its main importance lies in the political opening of the way for diplomatic relations, both bilateral and, as was evident in the period following the visit, multilateral relations. In a joint communiqué the P.R.C. and the U.S. confirmed the principles of normalizing bilateral relations, but also expressed separate positions on important global issues, including Taiwan (Joint Communique, 2021). In 1973, the U.S. government established a liaison office in Beijing, which in 1979 was transformed into the U.S. embassy. This happened after the U.S. (J. Carter's administration) recognized in December 1978 the state authorities of the P.R.C. as the legal government of the P.R.C. and, as a result, established official diplomatic relations with the P.R.C. in 1979 (the so-called second joint communiqué). At the same time, the J. Carter administration suspended diplomatic relations with the Republic of China (Taiwan). In order to maintain American interests in Taiwan, as well as to ensure Taiwan's security, the U.S. congress passed the Taiwan Relations Act in April 1979. The recognition of the P.R.C. and the establishment of diplomatic relations at the embassy level had far-reaching geopolitical implications and afterwards impacts on trade. In particular, this affected the perception of China by countries within the U.S. sphere of influence and common political interests. Following the example of the U.S., diplomatic relations were established by, among others, Germany, the United Kingdom and Japan. It should be mentioned that the P.R.C. conducted intensive diplomacy during this period, regardless of relations with the U.S. In the 1970s, the P.R.C. established official diplomatic relations with a large number of countries in Africa, Latin America, the Middle East and Southeast Asia.

3. The nature of Chinese market transformation

Market transformation, along with globalisation and regionalisation, is among the main processes shaping the modern world economy and its shifts. It has encompassed the national economies of the former communist states, whose combined population is now

over 40% of the world's population. A key position among them is occupied by China (approx. 19,5% of current global population).

The Chinese case suggests that market transition is possible without a parallel transformation of the political system. The opposite case is that of Central European Economies, where systemic political and institutional changes initiated the market transition processes. Thus, China represents a specific model of market transition, *the socialist market transition*. Its main objective, the rise of economic efficiency, has been achieved by gradually introducing market mechanisms into the planned economy. Hence with regard to its main objective, the rise of economic efficiency, there is no substantial difference as compared to the capitalist model of transition applied by Central and Eastern European countries (CEE).

The Chinese pattern of transition can be called gradual, where the main socio-economic and political objective is to build a market economy while adhering to the single-party authoritarian political system (Chinese capitalism). It has fundamental implications for the very process of market transformation, making it gradual without a clear formulation of systemic goals at the outset of the process (Starzyk, 2018). In consequence, the Chinese market transformation develops throughout the course of two liberalization processes, which have not been synchronized as in the case of CEE. The first process (external liberalization), has been ongoing from the very beginning of transition (1978) when foreign trade began to be liberated, thus allowing greater flow of goods and services, as well as the import of new technologies thanks to political decisions to open the economy to foreign capital and technology. Some five years later this was followed by decentralization of economic decisions giving room for the gradual building of market mechanisms. This was coupled with substantial abolishment of price and trade controls, as well as the privatization of state enterprises. Thus, in the case of China, so called internal liberalization occurs as a secondary issue as compared to external liberalization gradualism.

Despite this specific sequence of transition priorities, which determines the nature of the gradual model of transformation, the main goal of the Chinese economic transition, the rise of economic efficiency, is being realized — a fact reflected by increased GDP, technological change, internal and external equilibrium, international competitiveness and wealth.

One of the main prerequisites (preconditions) for Chinese market transformation is the move away from an autarkic model of development to an open market model, the essence of which is the opening up of the economy, which can be defined as the process of linking the development of a given economy with the world economy in order to increase economic efficiency and in this way international competitiveness leading to a higher position in the world economy.

4. Opening up of the Chinese economy

The concept of opening up an economy differs from that of an economy's openness; the former has a dynamic dimension, the latter a static one. However, these concepts are interrelated and are characterised by similar quantitative economic indicators.

The concept *economy openness* shows the state of an economy's foreign linkages. It is defined by a series of quantitative indicators illustrating the relationship between foreign trade and other aggregates of an economy. In international economics, it is defined as the share of foreign trade in GDP (exports + imports / GDP), which most generally defines the place of foreign trade in an economy. In the case of China, this indicator was 33.6% in 2017, which placed China among the open economy countries given the size of its GDP (NBSC, 2017). Additional indicators more closely defining the openness of the economy include e.g. export and import income rates, which show the ratio of exports and imports to GDP.

The concept *opening up the economy* defines an economic process of linking the development pattern of a given economy with those of the world economy through appropriately influenced investment processes, while taking into account foreign supply and demand, in order to increase economic efficiency manifested in GDP growth, technical progress, external and internal balance, increased competitiveness and, as a result — increased prosperity. Thus, the phenomenon of the opening up of the economy is dynamic in nature and gravitates towards the notion of its development and internationalisation, as it involves growth and the qualitative transformation of an economy in conjunction with foreign trade flows that influence investment processes and, as a result, the dynamics and structure of GDP (Starzyk, 2009). In the author's opinion this process has now enabled China to occupy the second position in the world economy.

There are a number of economic indicators specifying opening up of the economy which include income elasticities of exports and imports. In the case of China, the foreign trade volume grew faster than GDP, the elasticity indices were higher than 1, which signifies an increase in the share of foreign trade in GDP and indicates the opening up of the economy. Another indicator specifying opening up of the economy is the increasing level of exports and imports per capita. In 1978, the value of merchandise exports per capita in China was approx. 10 billion USD. Two years later, in 1980, it was already almost double that — 18 billion USD, and it continued to increase in subsequent years (USD: 1985 — 26, 1990 — 55, 2000 — 197, 2007 — 923, 2008 — 1082. At that time, China is assumed to have surpassed the indicator value qualifying a country as an open economy) (Starzyk, 2009). Between 1978 and 2017 China's foreign trade grew on average by 14.1% annually, much faster than elsewhere (Li & Jiang, 2018).

Taking into account the criterion of balance of trade, three phases in the opening up of the Chinese economy can be distinguished: pro-import phase; intermediate phase;

pro-export phase. The pro-import phase of the opening up of the economy is characterised by an increase in economic turnover, especially faster imports, leading, on the one hand, to an increase in production and economic efficiency thanks to technology transfer (mainly through production cooperation, FDI in particular). However, on the other hand, it tends to create an import surplus. This was the case in China between 1978 and 1989. The second phase of economic opening up, the *intermediate phase*, is characterised by the achievement of an equilibrium trade balance, which took place between 1990 and 1995. The third phase of economic opening up, the pro-export phase, has been characterised, since the mid-1990s, by a sustained trade balance surplus which encouraged China to further liberalise its trade policy and to be more open in its foreign economic policy.

In the third phase of economy opening the pro-export phase (Ex > Im), we see the predominance of liberalising elements in foreign economic policy. This is, on one hand, a logical consequence of export expansion, and on the other, a deepening of integration processes of the Chinese economy into the world economy, marked by China's accession to the WTO in December 2001. The accession led to the liberalisation of foreign trade enabling all Chinese companies to conduct foreign trade, reducing tariffs and eliminating or simplifying non-tariff barriers, such as import licenses and quotas (Li & Jiang, 2018). Despite trade liberalisation, China's integration in the world economy was accompanied by an accumulation of foreign exchange reserves as a result of a sustained export surplus. In 2015, these amounted to USD 3.4 trillion, which at the time represented 29.08% of global foreign exchange reserves (Skopiec, 2017, p. 47). This favourable situation for the Chinese economy, however, has a negative impact on the further development of the global economy, especially when we consider the problem of international payment disequilibrium, an intensification of which was observed after the 2007/8+ financial crisis.

5. China-U.S. trade balance and the international payment disequilibrium

Since the turn of the century, there has been a rise in protectionist tendencies in the world economy, resulting in a slowdown in international trade and, consequently, in globalisation processes. One of the main sources of this phenomenon have been growing international payments imbalances, which have intensified in the wake of the 2007/8+ global financial crisis. This is a result of the structural changes in the world economy, which have led to the emergence of a group of surplus economies on the one hand and deficit economies on the other.

5.1. Surplus economies as a source of international payment disequilibrium

The group of surplus economies currently consists primarily of the emerging economies of East Asia. They pursue, especially China, export oriented development strategy and are thus characterised by growing export surpluses and growing foreign exchange reserves. These economies, referred to as surplus economies, use protectionist instruments, mainly those classified as strategic trade policy, which lead to an increase in their international competitiveness. This currently applies to China in particular. On the other hand, in parallel, a group of deficit economies emerged at the turn of the century, among which are the U.S. and some Western European countries, which, in turn, are characterised by growing trade balance deficits an consequently, current account deficits.

This phenomenon is accompanied by a shift in the development of the world economy away from highly developed countries, especially the U.S. and Western Europe, to the emerging economies of Asia, especially China and, since the turn of the century, India and the Gulf countries. Following Brzezinski (2008, p. 113), this constitutes, along with common global problems, such as poverty and terrorism, the most important phenomenon affecting the transformation and prospects of the contemporary world economy (as seen from the perspective of the first decade of the 21st century).

Following the trends generally outlined above, a major problem for the development of international trade is the breakdown of the balance of payments in the triangular trade relationship: U.S. – East Asia (mainly China) – Western Europe. This situation, worsening since the turn of the century, was to become one of the main causes of the 2007/8+ global financial crisis (Starzyk, 2012).

A return to an international balance of payments as a condition for avoiding another crisis therefore requires an increase in the competitiveness of developed economies and a corresponding increase in their exports. Thus, it is also associated with an increase in imports of surplus economies, especially China, e.g. through RMB revaluation as postulated by the U.S. It should be noted in this context that the trade and exchange rate policies pursued by China after its WTO membership in 2001 have been described as mercantilist and a driving force of currency war (Brunet & Guichard, 2011). In addition, they have also become a significant cause of the China-U.S. trade war (see section 6 of this chapter).

The complexity of the current breakdown in the international balance of payments and the rise in protectionism associated with it also lies in the fact that the perpetrators of this breakdown are, on the one hand, the deficit developed economies, which have traditionally played a dominant role in the international transfer of goods and services and factors of production while also playing a key role in the technological transformation of the world economy and in shaping the mechanisms of international economic interdependence. On the other hand there are the "catching-up" surplus emerging economies, especially China, which already account for approx. 50% of world GDP and similarly

of international trade. In this respect we are dealing with two comparable economic potentials which currently begin to compete contrary to their complementarity in the past. This situation, and the consequent increase in trade protectionism poses a new research challenge for economic science, especially international economics. Due to its geopolitical dimension, it is also becoming an important issue for political science and international relations in particular.

5.2. The Nature of international payment disequilibrium and its phases

The concept of international payment disequilibrium, the opposite to international payment equilibrium[1], is generally understood as a state of international economic relations that makes it impossible in the long term to really balance the international payments of a group of economies with a significant share of world trade (which hereinafter will be referred to as leading economies). These currently include both developed economies and some emerging economies, mainly in East Asia. They currently account for around 80% of world trade. The leaders are the U.S. and China, respectively. It is therefore important to emphasise that large economies, both surplus and deficit ones, are responsible for international payment disequilibrium, although the role of the latter is much greater, as it is the trigger and determinant of the phases of international payment disequilibrium.

We will refer to the phenomenon of unbalanced trade balances in the group of leading economies, treated in this paper as a source of international payment disequilibrium and the rise of protectionism (both to deficit economies, i.e. with a growing negative balance of trade over the long term, and to surplus economies, i.e. with a positive balance). It can be argued that the latter are now more than ever responsible for the breakdown of the international payment equilibrium. Thus, it can be assumed that the abandonment of protectionist practices by deficit economies, especially the U.S., will depend on corresponding changes in the trade policy of emerging economies, especially China.

Depending on the size and dynamics of the build-up of negative and, respectively, positive trade balances of leading economies, analysing the causes and consequences of the global financial crisis 2007/8+, five phases of the build-up of international payment disequilibrium can be distinguished, i.e.: *shaking up – collapse – breaking up – crisis – recovery* (Starzyk, 2012). Here, manifestations of protectionism occurring in the individual phases are discussed in the context of the current realities of the global economy and China-U.S. trade in particular, including the trade war.

[1] The concept of international payment equilibrium in the Polish economic literature was first formulated by Zbigniew Kamecki, who defined it as a state of international economic relations enabling the real balancing of the current accounts of the economies responsible for the processes of the world economy (Kamecki, Sołdaczuk, & Sierpiński, 1964, p. 384).

The first phase, *shaking up*, is conjunctural in nature. It is manifested by some countries developing a negative while others a positive balance of trade with an increasing tendency towards growing trade deficit by the former. In a market economy, such a situation is a normal phenomenon and is related to the autonomous nature of transactions within the current account. It does not yet constitute a reason for the application of protectionist trade policy tools. This phase occurred in the mid-1990s in the form of a growing trade balance deficit, especially of the U.S. and some European economies, being accompanied by a growing export surplus of some Asian emerging economies, especially China, but also South Korea, Taiwan, Singapore and Hong Kong. This leads to an increase in their official foreign exchange reserves.

The next phase of international payment disequilibrium, *collapse*, occurs when the *shaking up* phase lasts beyond the middle term and is accompanied by a growing negative balance of trade of other deficit economies. This then represents the beginning of conflicting interests of deficit and surplus economies in the areas of trade in goods, services and financial transactions, resulting in an increased use by deficit economies of protectionist measures, primarily non-tariff ones. This occurred in the first half of the decade of the 21st century and is particularly true of the U.S., whose trade deficit in 2005 amounted to approximately USD 800 billion (this represented approx. 7% of U.S. GDP and more the 2% of world GDP at the time).

It is important to emphasise that the next, *break-up* phase also requires an adequate response from the governments of surplus economies.[2] It then becomes necessary to implement appropriate trade policy tools on both the export and import side. In the case of exports, this mainly involves the reduction of export subsidies and other strategic trade policy tools. In the absence of an adequate response in the break-up phase of the international balance of payments by both deficit and surplus economies and the IMF, a breakdown occurs (which occurred in the second half of the first decade of the 21st century and was instrumental in the outbreak of the global financial crisis). In this context, Lutkowski (2006) raised a question concerning the scale of tensions generated by such a large and long-lasting trade imbalance, especially between the U.S. and China but also other East Asian and oil countries that the current international monetary system can resist. He stressed the importance of this problem, as it is a question of preserving the systematic ability to facilitate trade and capital exchanges and promote global economic growth. As he argued, this condition would not be met if maintaining the existing rules of the system came at the expense of high exchange rate volatility, volatile and high

[2] This was pointed out much earlier by Rączkowski (1984), e.g. his consideration of the responsibility both of deficit and surplus countries for bringing the balance of payments into equilibrium. When this is linked to international payment disequilibrium it becomes clear that it is in the interest of both deficit and surplus economies to remove the above distortions, especially if they involve leading economies. It is the surplus economies which should also shoulder the burden of adjustment processes (Rączkowski, 1984, p. 261).

interest rates, recession and stunted growth with accompanying deflation or inflation (Lutkowski, 2006).

In a scenario where the *break-up* phase was sustained over a longer period of time by the U.S. or other open economies there would be a financial crisis which, if not resolved, could evolve into a global economic crisis covering the spheres of production, exchange and consumption more and more deeply and spreading to all other economies open to international economic exchange.

Change in the exchange rate policy of surplus economies could be important for the recovery from the *break up* phase of the international payment disequilibrium. This mainly concerns China and the revaluation of the RMB, which could result in an increase in imports and a relative reduction in the country's exports. It is worth noting that the undervaluation of the Chinese currency and the related currency war was one of hot topics discussed in the wake of the 2007/8+ financial crisis (The Economist, 2010). At the time, the author of this chapter wrote about the problem — "the ongoing currency war may lead to a deepening of protectionist phenomena, leading to economic nationalism. This, in turn, could lead to a trade war, which would manifest itself not only in a decline in trade, but also in capital, which would undercut the foundations of East Asian development and could lead to another global economic crisis triggered by the emergence of new perturbations on global financial markets" (Starzyk, 2012, p. 544). Today, it is not too late to try to prevent this situation from materialising. It is essential to forge a U.S.-Chinese consensus on the RMB exchange rate to curb the effects of a currency war, as well as to attempt to renegotiate the China-U.S. trade agreement (from February 2020).

6. U.S.-China trade war: the trade balance perspective

Foreign trade is a tool for economic expansion, including geopolitical expansion. In this context, trade cannot be seen through the usual, simplified trade-tariff/non-tariff barrier relationship. Recently, trade expansion has been increasingly used to achieve long-term strategic policy objectives. Building competitive advantages in trade, under certain economic conditions, requires the implementation of a variety of other instruments, the purpose and scope of which is not always visible at first glance. For example, the policy stimulating the development of joint ventures had a completely different dimension and goals in the case of CEE countries and China. In the first case, the aim was, in particular, to stimulate domestic production, while in the second it was often about acquiring or pursuing an unfriendly take-over of technology and then developing it for the exclusive use of Chinese controlled companies (and consequently weakening the competitive advantages of the country that developed the original technology).

Analysing the real problems raised by exporters, it can be concluded that equal market access remains only in the sphere of economic theory, often in limited relation with free trade agreements and WTO membership. These regulations focus on trade issues, which in fact are shaped by a number of other regulations and policies on which trade arrangements have a limited impact. Returning to the previous example of the joint venture, a policy in this area can be implemented in the conditions of well functioning intellectual property protection regulations or in the absence of such regulations (USTR, 2022). As a result, both political intentions and economic effects, seemingly of the same concept, can be extremely different.

Thus, one should see the U.S.-China trade war in this broader context and bear in mind that it did not start with the presidency of Donald Trump, but was proceeding with varying degrees of intensity for many years. It has both a local dimension, i.e. affecting the economies of the U.S. and China, but also a regional one, affecting economic relations in other countries and regions.

One of Donald Trump's main presidential campaign slogans was to protect American jobs against excessive imports from China and to achieve a balancing of U.S.-China trade. Just one year after being sworn in as president, the Trump administration launched protectionist measures to reduce imports from China in order to improve the trade balance with that country and to develop its own manufacturing and related job creation (Hanson, 2021).

The trade war between the U.S. and China intensified at the beginning of 2018. In February 2018, the U.S. increased tariffs on imports from China of products such as photovoltaic panels and white goods (the value of these imports is approximately USD 50 billion). In the following months, decisions to increase tariffs on further products took place affecting an estimated $436 billion of Chinese products (Cooray & Panilevel, 2022). In response, China also raised tariffs on selected U.S. products estimated to be valued $160 billion (Cooray & Panilevel, 2022). These actions proceeded with varying intensity and effects until the end of 2020. The effect of the increased tariffs was partly offset by changes in their tariff policies towards other countries. In order to normalise mutual trade relations, the two sides decided to sign an agreement, which came into force in February 2020.

The Economic and Trade Agreement Between the Government of the United States of America and the Government of the People's Republic of China (2021) was a culmination of the policy pursued towards China by the Donald Trump administration. The agreement is unique in its nature, given both the mechanism of mutual commitments and its material scope. In its commercial essence, it is a manifestation of protectionism. Below are examples of some of the elements it contains:

- Trade expansion — e.g. China's commitment to import certain goods and services by no less than USD 200 billion over the next two years;

- Agriculture — reducing various types of trade barriers and China's commitment to purchase a certain value and category of products;
- Technology transfer — basing technology transfer on voluntary and market principles, e.g. China's move away from regulations forcing technology transfer by U.S. companies operating in China to Chinese companies;
- Intellectual property — e.g. China's commitment to measures aimed at reducing IPR infringements;
- Macroeconomic policy and exchange rate issues — e.g. China's commitment not to use targeted devaluations of RMB to impair the competitiveness of U.S. imports. With regard to the exchange rate, it is worth noting that in August 2019, the U.S. Treasury Department, based on its investigation, identified China as an exchange rate manipulator, the first time this has happened since the mid-1990s. (U.S. Department of the Treasury, 2019)

A significant doubt with respect to the impact of the implementation of the agreement in question relates to the question of whether it is able to stem the build-up of international imbalances of payments by changing the unfavourable balance of trade for the U.S. Providing a competent answer to such a generally formulated question requires further research beyond the scope of this paper.

The objectives of the Agreement, however, have not yet been met. Based on an analysis of the Peterson Institute for International Economics, which is tracking U.S.-China trade in relation to the agreed obligations, China purchased only 57% of the total U.S. goods and services exports over 2020–21 that it had committed to buy (Brown, 2022).

The trade war between the USA and China cannot be perceived as a bilateral conflict as it brings about worldwide consequences reflected in a decrease of international trade and global GDP. Taken together with the COVID-19 pandemic it constitutes a major challenge for international community (Żukrowska, 2020).

7. COVID-19 and China-United States trade

7.1. COVID-19 global effects

In December 2019, The World Health Organisation (WHO) issued a warning about a new virus attacking the respiratory tract that had emerged in China. By its slowing down and disorganisation of international trade, the COVID-19 pandemic has negatively affected the world economy, i.e. globalisation, regionalisation and market transformation. It has caused the collapse of industrial production on a global scale and disrupted the system of logistics and financial linkages (Brilliant, Danzig & Oppenheimer, 2021).

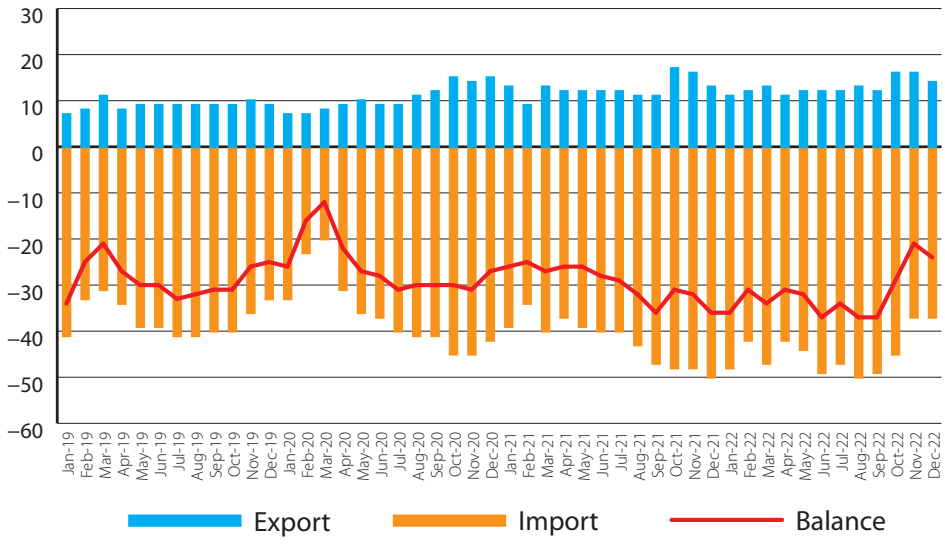
According to the World Trade Organisation (WTO), there was a 5.3% decline in the volume of global merchandise trade in 2020 (compared to 2015). The value of global exports in 2020 fell by 7.5% to USD 17.6 trillion. Merchandise imports saw a 7.6% decline in value to USD 17.8 trillion. The impact of the pandemic on global trade became particularly evident in the second quarter of 2020, when the volume of global merchandise trade declined by 15% compared to the second quarter of 2019 (in the second quarter of 2020, compared to the second quarter of 2019, the value of exports decreased by 21.3% and imports by 20.6%).

In the second half of 2020, as a result of the decline in infections and as a result of vaccination, there was a loosening of the restrictions imposed, which was reflected among other things, in an increase in the value of exports and imports in the third and fourth quarters of 2020. In the third quarter of 2020, the value of exports increased by 20.8% compared to the second quarter and stood at USD 4.5 trillion. Meanwhile, imports increased by 18.3% to USD 4.5 trillion. The fourth quarter of 2020 saw a further increase in the value of global merchandise trade compared to the previous quarter, with exports increasing by 10.0%, to a volume of USD 4.9 trillion, and imports increasing by 9.7% to USD 5.0 trillion.

7.2. COVID-19 and U.S.-China trade

The COVID-19 pandemic has significantly impacted the U.S.-China trade. China-U.S. trade in 2020 saw a stagnation in trade against 2019.

Figure 1. U.S.-China trade monthly trends for the period 2019–2022, USD billion



Source: U.S. Census, Trade in Goods with China, own elaboration.

The figure below illustrates U.S.-China trade on a monthly basis. It can be seen that the years 2022 and 2021 represent growth in total trade compared both to 2020 and 2019 (in some months well above the corresponding period in 2019). In 2022, despite trade restriction measures implemented both by the U.S. and China, the U.S. trade deficit with China further deepened.

During the COVID-19 pandemic there was a decline in the trade balance deficit, which may be related to the decline in U.S. imports from China, although it is premature to draw broader conclusions given the short period of the analysis in question. In addition, bilateral trade has been affected by other significant factors, including trade restrictions (trade war), the war in Ukraine (2022) and the revival of global trade (2021/2022).

Table 1. U.S.-China trade yearly trends for the period 2019–2022, USD billion

	Export	Import	Turnover (Export + Import)	Balance	Balance as % of turnover
2019	106,5	449,1	555,6	–342,6	–61,7%
2020	124,5	432,7	557,2	–308,1	–55,3%
2021	151,4	504,9	656,4	–353,5	–53,9%
2022	153,8	536,8	690,6	–382,9	–55,4%

Source: U.S. Census, Trade in Goods with China; own elaboration.

To identify sectors which share of the U.S.-China trade changed most, a detailed analysis has been made based on SITC 3-digits trade data (in total 263 product categories).

Table 2 presents a summary of the analysis.

In the first step, shares in trade were calculated. Then, in the second step, based on variation of share in trade turnover in 2019 and 2022, sectors with significant shares in trade turnover and sectors with the largest changes in shares in total import and export were identified. Within such a defined data set it can be concluded that, exports to China: sectors with the largest share increase include maize and oil seeds, decrease — aircraft & associated equipment; imports from China: sectors with the largest share increase include toys and sporting goods; decrease — office and telecommunications equipment.

Thus, despite certain set-backs in the import of hi-tech imports from China, driven by security motives rather than the pandemic, the value of trade between the countries is rising as other categories of goods are compensating for this decrease. It is yet to be seen if this rise can be sustained in the long-term. Some authors (Elia et al. 2021; Cooray & Palanivel, 2022) suggest that supply chain problems caused by COVID-19 will lead to increased diversification of international sourcing which might be further exacerbated by current geopolitical uncertainty.

It is to be remembered that the tensions between the U.S. and China, although heightened by COVID-19 are part of a broader power game between the two countries which

has political and human rights connotations (Cooray & Palanivel, 2022) and as such will not end with the pandemic.

Table 2. Structure of U.S. exports and imports with China, % (calculated based on USD billion, % is the share in total export /or import/), selected product categories

Sector	Export				Import			
	2019	2020	2021	2022	2019	2020	2021	2022
Aircraft & associated equipment	9,8%	3,5%	3,1%	3,6%	0,1%	0,1%	0,1%	0,0%
Articles of apparel of textile fabrics	0,1%	0,0%	0,0%	0,0%	1,9%	2,2%	2,1%	1,6%
Crude oil	2,8%	5,5%	4,0%	4,5%	0,0%	0,0%	0,0%	0,0%
Electrical machinery and apparatus	0,7%	1,0%	0,6%	0,6%	3,1%	3,3%	3,0%	3,5%
Furniture & bedding accessories	0,1%	0,1%	0,1%	0,1%	4,9%	4,5%	4,0%	4,1%
Maize (not including sweet corn) unmilled	0,1%	1,0%	3,3%	3,4%	0,0%	0,0%	0,0%	0,0%
Medicaments (including veterinary medicaments)	1,5%	2,0%	1,6%	1,8%	0,1%	0,1%	0,2%	0,2%
Medicinal products, except medicaments	2,6%	1,9%	2,9%	4,4%	0,5%	0,5%	0,6%	0,8%
Miscellaneous chemical products	2,3%	2,1%	2,0%	2,2%	0,3%	0,3%	0,5%	0,4%
Office machines	0,2%	0,2%	0,2%	0,1%	1,2%	1,2%	0,7%	0,6%
Oil seeds and oleaginous fruit	7,6%	11,5%	9,4%	11,7%	0,0%	0,0%	0,0%	0,0%
Telecommunications equipment	1,2%	0,9%	0,8%	0,7%	15,2%	15,3%	14,3%	14,1%
Television receivers	0,0%	0,0%	0,0%	0,0%	2,3%	2,5%	1,9%	1,8%
Toys and sporting goods	0,2%	0,1%	0,1%	0,1%	5,1%	5,7%	6,1%	7,5%

Source: U.S. Census, Standard International Trade Classification (SITC, 3-digits), own elaboration.

8. Conclusions

The COVID-19 pandemic disrupted the globalisation processes of the world economy, caused a decline in world GDP and disorganised international trade. In conjunction with the China-U.S. trade war, it has also hampered economic relations between these two major players in the world economy and has also been the cause of growing protectionism in China-U.S. trade and thus in international trade. If the trade war continues, it will pose a serious threat to the development of international trade and the continued growth of the global economy. It should, however, be taken into account that despite the applied protectionism measures China-U.S. trade has steadily grown. This could be interpreted as a weakness of the applied measures, including the weakness of U.S. policymakers to influence China to change its trade policy.

Moving away from confrontation in China-U.S. economic relations and embracing greater international cooperation in the economic and social areas affected by the pandemic is becoming a sine qua non for the continuation of globalisation processes in the world economy and international business.

Nevertheless, disruptions in supply chains caused by both protectionist measures and the COVID-19 pandemic are initiating a chain reaction in the area of strategic trade policy (Ambroziak, 2021). In the U.S., China and other countries, we can observe intensification of actions aimed at supporting the expansion of domestic industry, including through the relocation to the home country of existing production infrastructure located in other countries. This is often done as part of the so-called building resilient supply chains and striving for economic self-sufficiency. As a result, as also argued by Ciravegna and Michailova (2022) we can observe deglobalisation tendencies.

Due to the complexity of trade relations, it is currently difficult to clearly determine whether global imbalances are deepening and whether they are permanent. In this context, analysing imbalances at both the aggregate level and the bilateral level is important. The example analysed in the most detail in this paper is P.R.C.-U.S., but there are also many smaller countries where the trade deficit has a relatively much larger dimension and impact on their economies.

One such example is Poland, where on an aggregate level, imports have been more or less equal to exports in recent years, but the situation has been completely different on the bilateral level — in relation to China. According to Eurostat data, for the period 2020–2021 in current EUR prices: imports of goods from China increased by 4.5x; exports to China increased by 2.5x; the trade deficit increased by 4.9x; the ratio of exports to imports decreased from 18% to 10%. In such a situation both — the much lower competitiveness of the Polish economy compared to the U.S., as well as limited possibilities of Poland to influence the EU's trade policy in relation to China, raise important questions, e.g. — are we dealing with a permanent imbalance trend? To what extent does the trade deficit with China weaken the overall competitiveness of economies like Poland? How will it impact them in the long term?

China's gradually growing presence in developing countries as reflected by initiatives, such as the Belt and Road Initiative or the Asian Infrastructure Investment Bank, may allow China to continue its quest for power despite pressures from the U.S. or other Western countries triggered by human rights or political concerns (Cooray & Palanivel, 2022)

As noted by *The Economist* (The road, 2022), China is reorganising its global *Belt and Road* infrastructure programme to focus on greener projects. The United States and other members of the G7 have launched a rival programme, *the Partnership for Global Infrastructure and Investment* (June 2022), which aims to encourage investment in eco-friendly infrastructure in developing countries by 2027. Climate collaboration between the United States and China would help bring down the costs of green technology by integrating supply chains, and allow more efficient planning and financing of climate related projects in poor countries.

Due to the significant impact of global financial imbalances on the world economy, further research is required. This relates, however, to both to large and small economies.

One of the areas of research that is crucial for assessing the cost-benefits of trade is the question of ownership of the means of production, in particular capital. Currently, statistical analyses are carried out in relation to country A — country B, i.e. companies registered in country A — companies registered in country B. This analysis completely disregards the nationality of the investors who own these entities. Part of this issue is covered by analyses of incomes within the balance of payments analysis framework, but this seems to be insufficient. In particular, this applies to countries with a large share of foreign capital, facing the challenges of building domestic capital and domestic competitive advantages.

Other further research areas may include, e.g., the impact on international intra-branch division of labour, international competitiveness, foreign and international trade policy. Bearing in mind the politically necessary trade restrictions imposed on Russia, it may be worth investigating any similarities with the U.S.-P.R.C. trade war with regard to the impact on global financial imbalances.

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Cointegration Between Capital Flows and GDP in the Visegrád Countries. Implications for the Post Pandemic Era

Abstract. This chapter verifies presence of long-term co-integration between net capital inflows and GDP of the Visegrád Group countries (Czechia, Hunagary, Poland and Slovakia). Its aim is to investigate whether the GDP of the Visegrád (V4) countries and capital flows between the V4 and developed countries (in particular the European Monetary union) were integrated in such a way that they did not diverge from some equilibrium in the long term. The existence and strength of these relationships may be important for determining conditions for GDP growth in the post-pandemic era. Using the autoregressive distributed lag model (ARLD) the level of cointegration between push factors (current account and banks' net cross-border positions) and the net capital flows of the Visegrád countries is established. Furthermore, taking push factors as fixed regressors, and applying the ARLD model, the cointegration level between net capital flows and GDP, for the different time periods, is estimated for each of the V4 economies. The current account of the EMU was identified as a push factor for net capital flows in Czechia, Poland and Slovakia. Bank net cross-border positions of the EMU turned out to be push factors in Poland and bank net cross-border positions of the developed countries were statistically significant as push factors in Hungary and Slovakia. Using the ARLD model, cointegrations of current account and bank net cross-border positions with GDP were found in each of the V4 countries in the whole period 1995–2019. The strength of these cointegrations was the greatest in the last ten years i.e., in the period 2009–2019. No cointegration was found when calculated for 1995–2008. The analysis of data for the years 1995–2019 is extended by presenting recent changes of net capital inflows in the EMU and the V4 countries. The dynamics of the changes during the time of the pandemic (2020–2022) is discussed against the background of the results of cointegration. From the perspective of the past relationships between net capital flows and GDP in the V4 countries, changes in net capital flows observed in 2020 and later indicate potential threats to the recovery of GDP growth after the shocks caused by the pandemic and the war in Ukraine. If these shocks do not change the long-lasting cointegration between net capital flows and GDP then sudden and substantial changes of net capital flows in the V4 countries should be treated as an impediment to the recovery of sustainable GDP growth. Presumably, a corrected policy mix must therefore be adopted in order to avoid creating conditions for stagflation.

Keywords: current account, bank cross-border position, GDP growth, cointegration, pandemic

JEL classification: C29, E 44, F32, F43

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Introduction

At the beginning of the 90s increasing liberalization and globalization stimulated a surge of capital flows. The liberalization of the global financial markets was accompanied by growing capital account openness, flourishing financial innovations and deepening financial integration. This phenomenon, together with the rising volatility of rapidly mounting gross cross-border financial flows, caused a capital flow upsurge which continued until the global financial crisis (GFC) in 2008 and the Economic and Monetary Union's (EMU) debt problems in 2011. These two shocks changed the dynamics of capital streams and were characterized by simultaneous sharp declines in both capital inflows and outflows (Brockmeijer, Marston & Ostry, 2012; Cardarelli, Elekdag & Kose, 2009; ECB, 2012; Lane & Milesi-Ferretti, 2014; McKinsey, 2013; Reinhard, Ricci & Tressel, 2010; Reinhart & Reinhart, 2008; Viñals & Moghadam, 2011).

Capital movements, their level and dynamics are recorded in current, capital and financial accounts, which formally constitute a country's balance of payments. Consequently, by definition, the current account balance representing net capital flows is an outcome (in a given period) of net exports, income balances and capital transfers. As explained by Borio and Disyatat (2015) the current and capital account is "simply telling us whether a country is, on net, releasing resources to the rest of the world (if in surplus) or drawing on it for those resources (if in deficit)". If the economy experiences excessive and prolonged net capital inflows cointegrated with GDP this could indicate structural problems, e.g., low export competitiveness[1]. Therefore, cointegration between current account and GDP, if it exists, points to a specific long-term relationship between economic growth and foreign savings and at the same time unveils the risks of such long-term linkages for economic growth.

The current account balance shows the level of savings crossing borders, but not the method of financing a country's income and expenses. There are bank cross-border capital flows which address economy specific financial transactions. "Historically, cross-border capital flows mainly reflected transactions of goods or services with other countries. Over time, however, the financial aspect of capital flows has taken on a bigger significance" (Regling, 2017). Indeed, in the last decades cross-border flows have increased much faster than world trade and world GDP. This dramatic rise coincided with the financial deregulation in the global capital markets of the late 1990s and the early 2000s (Regling, 2017; Roy & Kemme, 2020). It entailed rising financial integration but also created thedanger of certain shocks, such as capital surges, stops, flight and re-

[1] We also acknowledge M. Obstfeld's three (related) reasons why prolonged and excessive current account deficits may lead to financial vulnerabilities, these are: (1) "sudden stops" and/or sudden retrenchment in capital flows; (2) a deterioration in the position of net foreign liabilities and (3) macroeconomic imbalances due to high demand elasticity of imports and low competitiveness of exports (Obstfeld, Shambaugh & Taylor, 2008; Obstfeld, 2012).

trenchments (Forbes & Warnock, 2011; Habib & Venditti, 2019). Despite arguments in favour of the pro-growth effects of capital flows, in reality "financial openness has proven a double-edged sword" (Carney, 2019). Capital inflow can increase economic growth, but capital flow volatility may do the opposite and finally reduce GDP in a period of increasing propensity to risk and hunt for yield. Potential costs associated with a cross-border flood of capital include misallocation of resources, pro-cyclicality or increased volatility (Forster, Vasardani & Ca'Zorzi, 2011). Cross-border financial flows could destabilize the global economy and lead to excessive current account divergence, as they make financial conditions more correlated across borders, consequently becoming hazardous channels for contagion (Allison, 2013; Cassidy, 2009; Lynn, 2011). Considering only the OECD countries, about 40% of the 75 large capital inflow episodes ended in a sudden stop and in either a banking or a currency crisis (Błaszczuk & Sawicki, 2017; OECD, 2011).

Medium sized open economies, like those of the Visegrád Group (V4) countries, are strongly interrelated with the external world through commercial and financial relations. It is vital therefore to recognise the dependence of the development of their economies on the dynamics of capital flows[2]. Relatively few studies have addressed this relationship so far, whether in the V4 countries or in other contexts (Gruber & Kamin 2005). In particular very few studies deal with the relationships between bank cross-border positions and economic growth. This study extends scarce research on these relationships and discusses the implications for postpandemic policy. It contributes to research both methodologically and by regarding the subject of the study. This is achieved by analysing the relationship between domestic capital flows in the V4 and capital changes in the environment using cointegration, a technique different from traditional regression. Next, the co-integration between GDP, the current account and net cross-border flows in each of the V4 is analysed. If such co-integration is a long term feature of these economies it will affect the recovery path from the current crisis.

The chapter is structured in the following way. After providing an overview of extant research on capital flows and economic growth, net capital flows in the European Monetary Union (EMU), the developed countries[3] and the V4 countries over the last 25 years are examined. Next, cointegration between push factors and the V4 countries net capital flows is calculated using the autoregressive distributed lag model. Then, having identified world push factors as fixed regressors, the cointegration between the V4 countries current accounts and bank net cross-border positions and their GDP is examined. After presenting the results, implications for the post-pandemic period are discussed.

[2] In the text net capital flows are defined as the current account of the balance of payments and after BIS banks' net cross-border positions on residents.

[3] As developed countries we adopted BIS classification.

Literature review

Capital flows as push factors

Net capital flows are the results of different causes. The IMF suggests that "although the importance of different "push" factors varies across studies, a consensus has emerged on the role of U.S. monetary policy, global risk aversion supply and global liquidity (especially in U.S. dollars)" as important factors that shape capital flows (Cerutti, Claessens & Puy, 2015). The IMF names the following variables as push factors in their reports: (i) the US VIX (S&P 500 Volatility Index) (ii) the average GDP growth rate in core economies (USA, Euro Area, Japan, and UK), (iii) changes in the expected U.S. policy rate, (iv) the slope of the U.S. yield curve (the difference between the 10 years and the 3-month U.S. government T-bill yields) and (v) the U.S. real effective exchange rate (REER) (Cerutti, Claessens & Puy, 2015). Some researchers add to that list a commodity price index (Kang & Kim, 2019) and the VIX (CBOE Volatility Index published by the FED). The VIX affects asset prices and capital flows in global markets and is closely related to conventional measures of investors' risk aversion. It is one of the so called "push factors" which exist in the global financial market, invariant across countries, influencing capital flows especially to peripheral countries. "Global risk, in particular, is significantly associated with extreme capital flow episodes and its role of global factors in international liquidity flows overshadows that of domestic ones" (Habib, 2019). Cerutti, Claessens & Puy (2015) analysing push factors for the EM economies distinguish the relative importance of different types of capital flows.

The change in the above factors collectively affects the dynamics of net capital flows recorded in the balance of payments of selected regions (the EMU and developed countries). Since the current account of these two regions and the V4 differs in scale, it is assumed that the net capital flows of the EMU and developed countries are the drivers of changes in the V4 countries (push factors).

Bank cross-border flows (CBF) enhance financial inclusion but have also proved to be one of the major financial channels through which stresses in the international financial system were transmitted (Takáts, 2011). An important element influencing the dynamics of the bank cross-border capital flows is the size and variability of the supply and demand of the so-called safe assets issued by financially safe countries ("risk heaven") (Sastre & Viani, 2014). This makes cross-border financial flows potentially as important as trade flows (or current account) in determining the dynamics of exchange rates and interest rates (Forster, Vasardani & Ca'Zorzi, 2011). This proved to be the case during the Global Financial Crisis (GFC) and during the EMU debt crisis or 2013 "taper tantrum" triggered by the FED policy. Therefore, bank net cross-border flows, if cointegrated with domestic capital movements, could increase or neutralize the effect of internal or external shocks. On the other hand, shock, if created by cross-border flows could strongly influence the

functioning of the international banking and capital market system, the structure of transmission channels and their role in capital flow creation. Based on this rationale, it can be argued that apart from the current account of the EMU and developed countries their bank net cross-border flows also constitute push factors for net capital changes in the V4.

Net capital inflow and GDP changes

In open economies GDP growth is correlated with capital flows as they change the level of resources used by the economy (Aizenman, Jinjarak & Park, 2011; Staehr, 2018)[4]. It is vital therefore to recognise the dependence of an economy's development on the dynamics of different capital flows. Various aspects of the importance of net capital flows for a country's GDP performance have been econometrically investigated. The World Bank has studied the relationship between foreign capital inflows and economic growth for many developing countries extensively (World Bank, 2000). Cross-country regressions found a positive relationship between capital flows and the growth of real gross domestic product per capita. Other aspects were also investigated, such as, volatility of capital flows, absorptive capacity, productivity and capital market integration. Also, the IMF has investigated capital flows and growth for many years e.g. (Mishra, 2001; IMF, 2016a). A number of empirical investigations were carried out by IMF staff (Phillips et al., 2013; IMF, 2016b) and EU analysts, especially after the onset of the financial crisis in 2008 and then of the following sovereign debt crisis in the Economic and Monetary Union (EMU) in 2010. Mody and Murshid (2011) regressed the average long-run (in 1980–2003) growth rate of real GDP per capita on a set of controls and the average capital inflow in 61 developing economies. They found the expected growth-enhancing role of foreign capital in a low volatility situation, while in high volatility conditions, capital inflows were negatively correlated with growth. Aizenman, Jinjarak & Park (2011) investigated the influence of the components of financial accounts on GDP within 100 emerging markets in the period 1990–2010. The relationships between GDP growth and lagged capital flows depended on the type of flows, economic structure, and global growth patterns were analysed. Edwards (2002) in his paper specified that substantial positive changes of current account (CA) have a negative influence on GDP. On the other hand CA changes are only indirectly dependent, through the level of investment, on GDP. Moreover, he statistically proved that CA balance changes are correlated with economic crisis.

In connection with the growing imbalances of the CAs in the United States, in 2005 Gruber and Kamin (2005) analysed a panel regression of the CA-to-GDP ratio for 61 countries from 1982 to 2003.Their studies confirmed a strong link between crisis and the CA

[4] Selected recent empirical investigations concerning capital flows and GDP relationships are presented in Błaszczuk and Sawicki (2017)

balance and also explained growing imbalances in the global financial market. As argued by Jordà, Schularick & Taylor (2010) an increasing negative ratio of CA-to-GDP was an important factor of financial crisis, though with a much smaller effect as compared to the credit-to-GDP ratio. A different approach was presented by Bagnai (2010), who confirmed a statistically significant positive relationship between the CA-to-GDP ratio and the State-Budget-deficit-to-GDP. Frankel & Saravelos (2012) in turn found that the CA balance had no significant effect on GDP, while the impact of external debt on the level of GDP turned out to be statistically significant. There are also dynamic balance-of-payments analyses within the framework of intertemporal theories (Gourinchas & Rey, 2013). In the intertemporal approach to the balance of payments it is assumed that the accumulation level of net foreign liabilities is limited in time by the terms of their repayment. The conclusions reached in a number of works are not unambiguous for determining the scale and relationship direction between current account and GDP and especially the long-term cointegration between balance of payments changes and GDP.

Only a few studies have focused on the relationships between bank cross-border positions and their impact on the real economy. The influence of the US versus the EMU as a push factor on EMU bank cross-border flows (CBF) was investigated (Cerutti, 2019). Lane and Milesi-Ferretti (2018) conducted research on the motives for bank cross-border flow dynamics. Choi, Furceri & Yoon (2018) investigated the international spill overs of fiscal shocks via banks' cross-border lending channels on the recipient economy. These studies also do not show whether and what long-term relationships existed between CBF net capital flows and GDP. They also fail to recognise whether and what long-term relationships existed between CBF net capital flows and GDP. In turn Bilas (2020a) using ARLD models, limits analysis of cointegration to the relationships between foreign direct investment (FDI) and GDP in the EU13. Results of cointegration tests indicated that there is no long-run equilibrium relationship between quarterly GDP growth rate and any of the FDI series in Croatia.

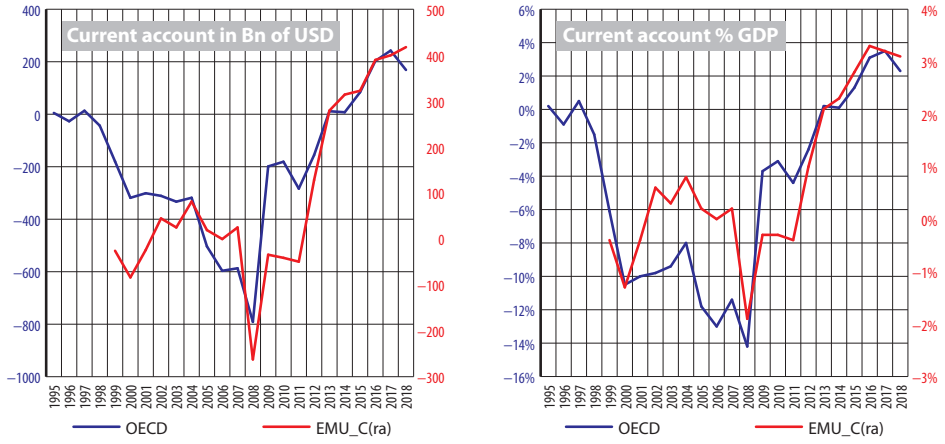
This chapter contributes therefore to the literature concerning long term relationships between net capital flows and GDP changes. This is achieved by means of a cointegration analysis between current account and bank net cross-border flows and GDP for the V4 economies in the period 1995–2019 and two subperiods 1995–2009 and 2009–2019. It is investigated whether different capital flows in V4 were integrated with GDP in a such way that they did not diverge from equilibrium in the long term.

Analysis of push factors for V4 capital flows

Current account of the balance of payments as a push factor

Since the current account of the EMU was selected as a push factor, the dynamics of this variable against the background of the OECD data deserve closer scrutiny (Figure 1)[5]. It is worthnoting the changing role of capital flows in the EMU within the analysed period.

Figure 1. Current account in the EMU and the OECD



Source: IMF Data Warehouse

From the beginning of the 2000's current account deficits of the EMU grew dynamically. The downward trend of the current account was halted by the global financial crisis (GFC) in 2008. Following the GFC, a similar change in current account balances can be noticed in both regions. The nominal expansion of the net capital flows was interrupted in around 2011, but the upward trend continued. In the OECD the results were affected by current account deficits registered in the USA, Australia, Canada, and Turkey, although the share of deficits in GDP in these economies slowly diminished. As for the EMU, the current account balance for the vast majority of the economies was positive and reached its nominal and relative maximum value in 2016 (3.3% of GDP). From this year on it slowly decreased, amounting to 2.8% of GDP in 2019, mainly due to a surplus of net exports of goods and services (2.1% of GDP).

[5] As the EMU countries are included in the OECD group the differences between the dynamics of these two region's current accounts show how OECD economies outside the EMU influenced results.

Bank cross-border flows position as a push factor

From the mid 90's the world[6] dynamics of cross-border capital flows began to change rapidly. These flows, as reflected by cross-border positions[7] rose from 53 trillion USD in 1995 to 192 trillion USD in 2006 (BIS, n.d.). In the period 2008–2013 these flows declined and amounted on average to minus 21 trillion USD. From 2015 to 2019, on average, net CBF amounted to 81 trillion USD. When their share in the world GDP8 is analysed, the importance of global bank cross-border flows becomes visible. In relation to world GDP, it was 49.1% GDP in 1995 and, 89% GDP in 2010. In the last 10 years this share fell to 62%. This could mean that in the period after the GFC world GDP dependency on bank cross-border flows has decreased. There are two reasons to support this thesis. The first is the growing importance of domestic capital. The second involves a slight increase in domestic currency loans provided by the international banks to local affiliates. However, we can also attribute this trend to statistical distortion as "investor exposures are increasingly distorted by firms' choices of where to establish legal residence and from what location to issue securities" (Bertaut et al., 2018). Analysing the subject structure of bank cross-border flows within the entire period 1995–2019, we notice that total bank cross-border claims were always always bigger than liabilities. On average, the position of liabilities exceeded claims by about 11%. The difference grew from 8% in 1995 to 14% in 2007 but in the following years it decreased to 6.6% by 2019. The question is whether a similar dependency change happened in the V4. There is also the important observation that while the volatility of gross flows has increased, net capital flows also registered as bank net cross-border positions of assets (difference between claims and liabilities) have become more stable.

Below gross and net bank cross-border positions[9] (BIS, Locational statistics, n.d.) against two geographical areas: the European Monetary Union EMU and developed countries[10] are reported (Figure 2).

Figure 2 shows (left figure) the share of gross (left axis) and net[11] (right axis) claims and libilities in the GDP of developed countries and the EMU (right figure). There has been a growing decoupling between gross and net flows since the late '90s, which means "that

[6] All countries reporting international banking statistics BIS

[7] FX and break adjusted change (BIS calculated)

[8] World Bank: https://data.worldbank.org/indicator/NY.GDP.MKTP.CD

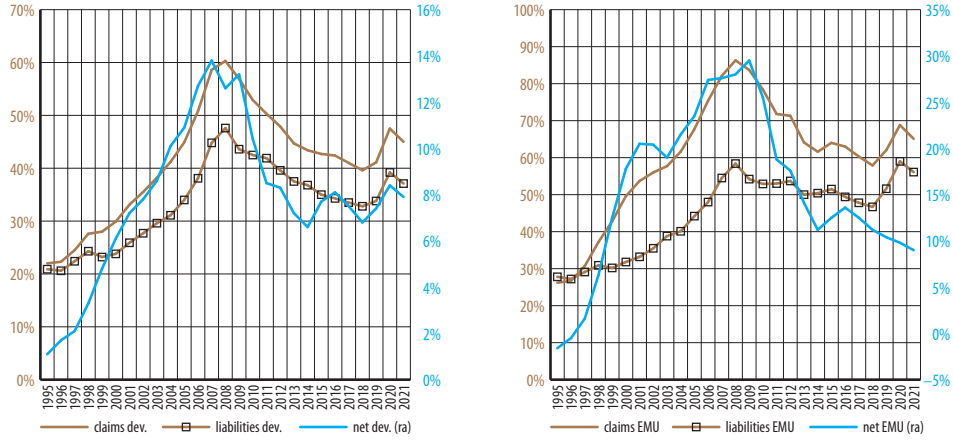
[9] "Position on a non-resident — for example, claim on or liability to a counterparty located in a country other than the country where the banking office that books the position is located" — see BIS Papers.

[10] BIS lists as developed countries: Australia, Austria, Belgium, Brazil, Canada, Chile, Chinese Taipei, Denmark, Finland, France, Germany, Greece, Guernsey, Hong Kong SAR, Ireland, Isle of Man, Italy, Japan, Jersey, Korea, Luxembourg, Macao, SAR Mexico, Netherlands, Philippines, South Africa, Spain, Sweden, Switzerland, United Kingdom, United States.

[11] Defined as the difference between cross-border claims and liabilities.

surplus countries do not necessarily "finance" deficit countries, and economies with a balanced current account may still get important financing from abroad and be vulnerable to sudden stops" (Guichard, 2017). The gap between claims and liabilities in both regions grew in the years preceding the economic crisis of 2008. The GFC brought a sudden stop to the sustained rise over the past decade in international financial integration. The significant gap between cross-border claims and liabilities was mainly the result of the flows registered in the non-banking sector. The question arises of how CBFS in the V4 behaved against the background of the decrease of CBFS in the EMU and the developed economies (push factors).

Figure 2. Cross-border positions in developed and EMU countries



Source: BIS Cross-border positions, by residence and sector of counterparty outstanding at the end of the second quarter 2021; share in GDP.

The Visegrád countries net capital flow fluctuations

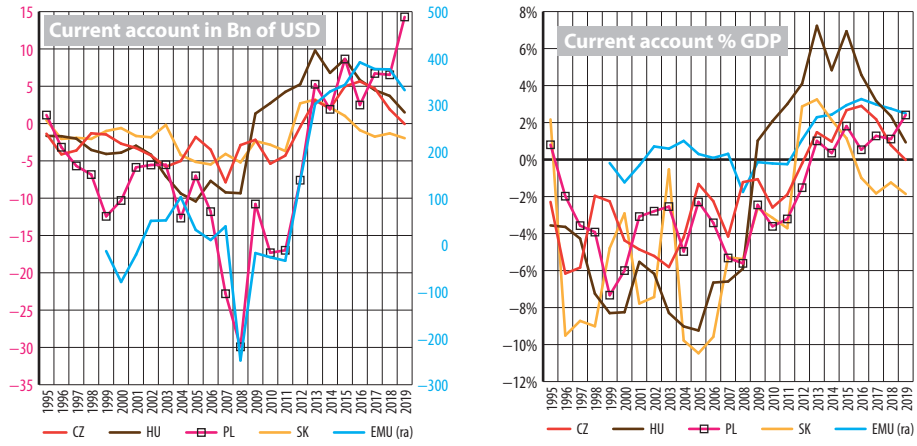
Current account changes in the V4 economies

A brief look at the changes of net capital flows of the V4 economies is due. First, the current account developments in the V4 economies against the EMU need to be scrutinised (Figure 3).

It can be noticed that the changes of the current account in the V4 countries show quite distinctive differences across the examined period. The share of current account in GDP was volatile throughout investigated period. Up to 2009 all the V4 countries were net importers of capital but in the following years this trend was reversed. On average, from 1995 to 2008 current and capital account deficits amounting to 4.89% GDP (±2,58%) were registered in the V4 countries, whereas between 2009 and 2019 there was a surplus

in the current account which amounted on average to 0.84% GDP (±2,63%). The balance improvements began differently in each of the examined countries. Hungary started building a current account surplus in 2010, the Czech Republic in 2014 while Poland was a net capital exporter in 2017 and 2019. It should be noted, however, that the results recorded in the current account of the balance of payments are directly dependent on capital transfers (mainly from the EU). Capital transfers in the V4 countries ranged from around 0.1% in 1995 to over 3% of GDP in 2015. In 2019, capital transfers amounted to 1.3% GDP. Furthermore, the importance of current account for GDP in the EMU countries was much lower than in the V4 economies. Only in Hungary, in recent years, did the current account surplus play a similar role in generating GDP as in the eurozone. It should also be noted that changes in the Polish current account balance were strongly correlated with current account changes in the eurozone (Pearson's r = 0.71). This is important for the cointegration phenomenon (if it exists) between a current account and GDP growth. If the pandemic shock changes the structure and dynamics of a current account e.g., diminishes the net exports (other things being equal) and historical cointegration between current account and GDP exists, then GDP can be expected to behave in line with its historic reaction.

Figure 3. Current account of the V4



Source: IMF and OECD data

Bank's net cross-border positions in V4 countries

As indicated before, increasing financial integration within Europe led to growing bank cross-border capital flows to Central Europe. These flows financed substantial current account deficits. Bank cross-border claims were more substantial than bank cross-border liabilities throughout the entire period and net BCF were positive (Figure 4).

Figure 4. Cross-border stock in the V4 countries % GDP

Source: BIS data; Author's calculations

The average bank net cross-border position varied significantly. Over the 1995–2919 period they amounted on average to 9,6% GDP in the Czech Republic, 24,5% GDP in Hungary, 8,8% GDP in Poland and to 13,5% GDP in Slovakia. Prior to 2000 these two series advanced in a similar way in all the V4 economies but they decoupled around two years before the V4 countries joined the eurozone. From that moment on, bank net cross-border flow positions co-moved with gross claims in all the V4 countries (Hungary being in some years an exception). The upsurge of gross cross-border claims was halted by the GFC, and cross-border lending to the V4 countries declined during and after the crisis. The immediate decrease of cross-border capital flows channelled the shock to each of the V4 economies in a varying degree. "The European Bank Coordination Initiative, known

as the "Vienna initiative", has helped to limit the degree of retrenchment of the euro area banking sector, particularly from the subsidiaries and offices situated in the most vulnerable countries" (Forster, Vasardan & Ca'Zorzi, 2011). It had a stabilizing effect on the financial shock created by the GFC. The restoration of bank cross-border claims after the GFC was to prevent the effects of the crisis, also for the investors. Gross bank capital outflows were smaller than anticipated, and the position of steady liabilities also played a stabilizing role (BIS, 2010). After 2012, in Hungary as well as in Poland net claims and liabilities began to fall. In Poland the bank net cross-border position was 50% lower in 2019 as compared with 2011.

Research methods

In order to verify if there exists a cointegration of the V4' countries GDP with current account and the bank net cross-border position, cointegration between these countries' current account and bank net cross-border position with push factors must be calculated. For this purpose unidirectional Granger causality tests were run to establish if push factors can be used for predicting current account and bank cross-border positions in V4 countries.

In order to evaluate cointegration between world push factors and the V4 current account and cross-border flows the ARDL (p, q) bound test model[12] is used, which in a generalized form is specified as follows:

$$(1) \quad \Delta C_t = a_0 + \sum_i^p \alpha_i \Delta C_{t-i} + {}_i\Delta P_{t-i} + \beta_1 C_{t-1} + \beta_2 P_{t-1} + \varepsilon_t$$

C — is a dependent variable; it denotes current account and bank net cross-border position; P — indicates push variables which constitute explanatory variables.

Dependent variables are the current accounts (C_) of each of the V4 countries; where the current account for the Czech Republic is denoted as (C_CZ), for Hungary as (C_HU), for Poland as (C_PL) and for Slovakia as (C_SK). Then, a separate model is estimated where dependent variables are the bank net cross-border position for each economy (CB_); dependent variables for each country are marked respectively as (CB_CZ), (CB_HU), (CB_PL) and (CB_SK).

P-push variables constitute explanatory variables; for each of the models these are: (a) the euro zone's current account (EMU_C), (b) net cross-border liabilities of the developed countries (NETCB_D) and (c) net cross-border liabilities of the EMU countries (NETCB_E).

[12] The ARLD model is described with the relevant literature in EViews10 User's Guide II Chapter 27; also: (Giles, 2018; Pesaran & Shin, 1995; Khan & Sajjid, 2005).

In order to evaluate cointegration between GDP and the V4 current account and cross-border flows again the ARDL (p, q) bound test model was used. To estimate cointegration between GDP and the V$ current account the model can be specified as follows:

$$(2) \quad \Delta GDP_t = a_0 + \sum_i^p \alpha_i \Delta GDP_{t-i} + {}_i\Delta C_{\_t-i} + \beta_1 GDP_{t-1} + \beta_2 C_{\_t-1} + \varepsilon t$$

To estimate cointegration between GDP and net cross border capital flows the ARLD model was used in the following form:

$$(3) \quad \Delta GDP_t = a_0 + \sum_i^p \alpha_i \Delta GDP_{t-i} + {}_i\Delta CB_{\_t-i} + \beta_1 GDP_{t-1} + \beta_2 CB_{\_t-1} + \varepsilon t$$

Where:

GDP is a dependent variable;

*C_* and *CB_* indicate current account and bank net cross-border position;

ε denotes shock,

a_0 is a constant term,

α and β are respectively the coefficients associated with lags of dependent variables and regressors;

p, q signify lags, respectively lags of dependent variables and regressors; p and q are determined using AIC, SC, HQ13;

t = 1995–2019;

The model is solved by assuming the absence of trend (with some exceptions); lags p and q are determined automatically by EViews10[14].

The model's results demonstrate the long-run equilibrating relationship between the variables represented by the error correction term CointEq(−1) and the effect of short run relationships[15]. The CointEq(−1) indicates the speed of adjustment to the steady state. It specifies percentage points of correction of the departure from equilibrium between net capital the departure of equilibrium between net capital and GDP. It should satisfy the following dependency CointEq(−1) ⊂ (−1,0); in CointEq(−1) < −1 the system oscillates around the state of equilibrium.

Long-term relationships resulting from the error correction model occur when the specified requirements expressed by *F* and *t tests* are met (Pesaran et al., 2001). Once the existence of cointegration is confirmed it can be inferred that the analysed variables move in the same direction. In other words when push factors and a country's net capital

[13] Akaike Information Criterion (AIC), Schwarz Bayesian Criterion (SBC) or Hannan-Quinn Criterion (HQC).

[14] EViews 10 is used to automatically select the number of lags for all variables.

[15] The short run results are not presented as not to interfere with the logic of the presentation.

flows deviate from a long-run relationship they adjust at a given (CointEq(-1) rate. The same reading should be applied to cointegration calculated between the V4 net capital flows and their GDP.

Research results

Cointegrations of the V4 net capital flows with push-factors

Cointegration (CointEq(−1)) for all statistically significant pairs of variables (push factors and current account as well as bank cross-border position of the V4 countries) is presented in Table 1. The results which meet conditions of the ARLD models using bounds tests are statistically significant. As the pairs of variables presented in Table 1 were cointegrated, the error correction term, as expected, was negative and highly significant. When more than one variable met such conditions the result with the greatest adjusted R-square was selected. The results of the ARLD models were also tested using the serial correlations LM test, the heteroscedasticity Breusch Pagan-Godfrey test and the stability diagnostics CUSUM test.

Table 1. Coinegrations between push factors and country's capital flows

X/Y	**C_CZ**	CointEq(−1)	**CB_CZ**	CointEq(−1)	X/Y	**C_HU**	CointEq(-1)	**CB_HU**	CointEq(−1)
EMU_C	5%	−1.16			EMU_C				
					NETCB_D			1%	−0.65
					NETCB_EMU			5%	−0.59

X/Y	**C_PL**	CointEq(−1)	**CB_PL**	CointEq(−1)	X/Y	**C_SK**	CointEq(−1)	**CB_SK**	CointEq(−1)
EMU_C	10%	−0.56	1.0%	−0.30	EMU_C	5%	−0.69		
NETCB_EMU	1%	−0.91			NETCB_D	1%	−1.46	2.50%	−0.57
					NETCB_EMU	3%	−1.62		

Source: Author's calculations; percentages represent the level of statistical significance

When the current account of the EMU (EMU_C) was considered as a push factor, cointegration existed between this variable and current accounts in all the V4 countries except Hungary. In the Czech Republic (EMU_C) was also cointegrated with the Czech cross border flows.

The net cross-border stock of the EMU (NETCB_EMU) was cointegrated with the Polish current account. The bank net cross-border position in Hungary (CB_HU) was cointegrated with net cross border flows of the EMU as well as developed countries. In Slovakia (NETCB_EMU) and net cross border flows of developed countries (NETCB_D)

were cointegrated with the current account. The cointegration coefficient was lower than −1 which means that the variables oscillated around equilibrium.

Therefore, taking into consideration the statistical significance of these results it is possible to say that in the Czech Republic current account was cointegrated with the net capital flows of the EMU. Similarly, in Poland the current account and net cross-border flows are cointegrated with the net cross border position of the EMU. In the case of Hungary there was long term interdependence between the bank net cross-border position and the bank net cross-border position in developed countries. In the Slovak Republic the current account of the EMU was cointegrated with the Slovak current account where bank net cross-border flows of the developed economies were loosely corelated with the Slovak bank net cross-border positions.

Summing up, current accounts and banks' net cross-border positions of the EMU and developed countries had been push factors in all V4 economies. Therefore, net capital flows in the individual V4 countries, although to different degrees, were dependant on the worldwide capital flows.

Cointegration between gdp and net capital flows in the V4 economies.

Cointegrations between the V4 GDP and their current account and bank cross-border positions, as previously, were solved using ARLD model's EViews10 specifications. Push factors were used as fixed regressors. No trend or a restricted trend were selected, depending on the dynamics of the raw variables. The number of lags for all variables was automatically chosen by EViews for the whole period and set of a maximum two lags for two shorter periods 1995–2008 and 2009–2019 was implemented. Results are presented in Table 2.

Table 2. Cointegration between GDP and net capital flows of the V4 countries

Cointegration GDP with current account					Cointegration GDP with cross-border flows				
	1995–2019					1995–2019			
	CZ	HU	PL	SK		CZ	HU	PL	SK
CointEq(−1)	−0.66	−0.58	−0.63	−0.49	CointEq(−1)	−0.55	−1.16	−1.00	−0.20
	1995–2008					1995–2008			
	CZ	HU	PL	SK		CZ	HU	PL	SK
CointEq(−1)					CointEq(−1)	−0.70		−0.24	
	2009–2019					2009–2019			
	CZ	HU	PL	SK		CZ	HU	PL	SK
CointEq(−1)	−2.25	−1.43	−0.72	−1.79	CointEq(−1)	−0.20	−1.78	−0.97	−0.62

Source: Author's calculations

With respect to the long-term relationship in the period of 1995–2019, the cointegration of GDP with the current account balance is at a similar level in all V4 countries. The recovery period after the current account shock is around two years. There was no cointegration between current account and GDP in the period 1995–2008 in any of the V4 economies. In the past ten years, cointegration between current account and GDP was similar to that registered in the long term only in Poland. In the remaining economies cointegration coefficients were ambiguous as they indicate the occurrence of oscillations between GDP and current account — cointegration coefficients were below minus 1 ($\lambda < -1$).

The strength of the interdependency between GDP and bank net cross-border flows varies. A close relationship in the years 1995–2019 existed in Poland and Hungary, when a return to equilibrium, following a shock, had taken place within a year. Weaker cointegration was seen for Slovakia, where 4 years were needed to return to equilibrium. In the years 1995–2008 a long-term dependence between net cross-border position and GDP was registered only in the Czech Republic and Poland. In the last ten years all the economies were cointegrated with bank net cross-border positions. The closest dependence was registered in the Czech Republic. In Hungary the cointegration coefficient was the smallest, which indicates the longest adjustment period.

Focsuing on the recent years, up to 2019, it can be noticed that, especially in Poland, the trend of changes in GDP was closely related to the trend of changes in net capital inflows. Only for this country were both current account and cross border flows statistically associated with push factors. This would indicate a significant dependence of Poland's GDP on changes of net capital inflows compared to the other V4 countries.

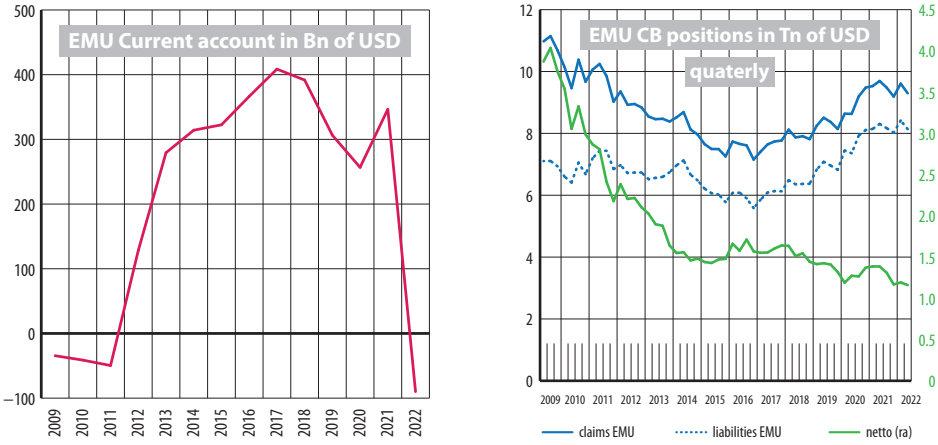
Discussion of recent developments

Bearing in mind the above findings, the following questions can be asked with respect to the COVID-19 implications for the V4 economies. (1) To what extent will the pandemic shock change the capital flows observed in the outside environment, (2) to what extent will the pandemic shock disturb the flow of capital movements between the external environment and the V4 economies and (3) how will these changes, assuming the existence of the observed cointegration between GDP and net capital flows, affect GDP in a post pandemic era characterised by energy and climate shocks.

Recent push factor changes

To discuss these topics, changes of the EMU's current account and bank net cross-border capital flows since 2009 need to be considered (Figure 5).

Figure 5. Current account and bank cross-border flows in the EMU



Source: Author's calculations; BIS and EUROSTAT data; 2022 Forecast;

With hindsight of the last 10 years, it can be observed that while the EMU's current account measured as a share in GDP fluctuated in 2020 and 2021, from January to October 2022 the EMU reported a EUR 86.7 billion gap, compared with a EUR 253.0 billion surplus during the same period of 2021.

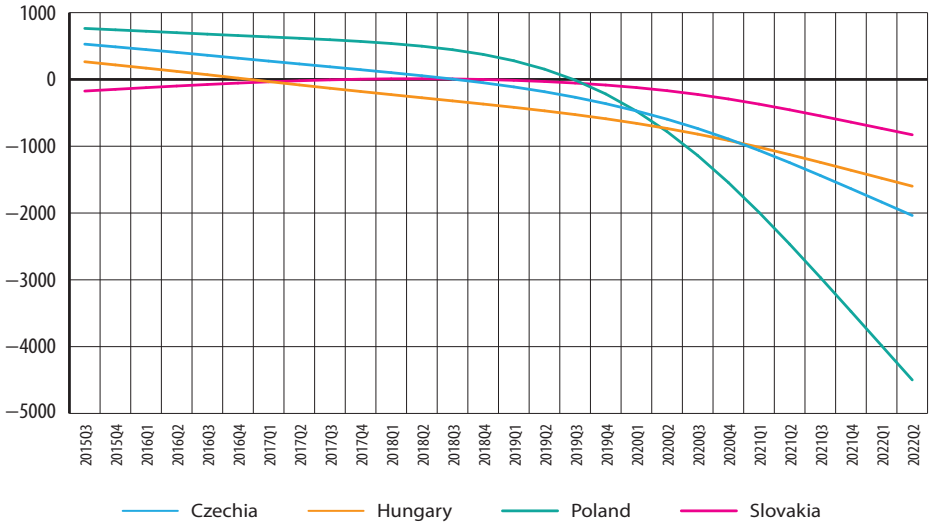
The EMU's net cross-border flows also fell due to faster rising liabilities. Comparing the last two years with the average registered for 2015–2019, net flows decreased by 13%. It is not possible to say if winding down the financial programmes implemented during the pandemic and energy crisis will not have an adverse impact on net capital flows to the EMU, as was the case in the past. However, the Fed decision of 2013 known as the taper tantrum did not stop capital flows (Davis, 2022); on the contrary, after 2013 a rising trend of bank net capital flows in the EMU was observed. Nevertheless, with further deterioration of the EMU current account and diminishment of the EMUs CBFs one cannot expect that push factors will support net capital inflows to the V4 countries.

Recent net capital flows in the V4

As regards current account development in the V4 countries, increasing surpluses were observed in the past, mainly due to a rising share of the balance of goods and services in GDP. This, along with the EU capital transfers, shaped the dynamics of their balance of payments in 2010–2019, when foreign trade was vital for GDP growth in each of the V4 economies. More recently, the pandemic and energy shocks caused a decline in GDP. At the time of writing this chapter, slightly negative developments of external balances in

the V4 can be observed. The trends of the balance of payments (Hodrick-Prescot — HP) presented in Figure 6 are influenced by the negative changes already registered in 2021 and 2022, especially in Poland. If the current account declines further, this could be attributed to particularly weak V4 net exports. If additionally, EU remittances are stopped or restricted in some countries and the cost of money increases, current account in the V4 countries could weaken further and existing cointegration between current account and GDP may slow economic growth.

Figure 6. Current account changes trend HP (1600)



Source: Author's calculations, EUROSTAT data

It is widely accepted that changes in bank net cross-border flows are not fully aligned with current account development. They could fall when the current account is being rebuilt. However, bank cross-border flows are not only a source of financing current account deficit, they are also an instrument of financial integration of an economy with capital markets. If bank cross-border flows decline when world non-bank flows stabilise or even increase that could suggest decreased interest of foreign investors. In turn, the substantial current account surpluses which occurred i.a., in 2020, accompanied by falling bank cross-border flows could signify certain structural changes between economic activity, bank cross-country capital flows and domestic finances. If CB flows in the V4 countries during the last three years are compared (Table 3) it becomes apparent that inflows have only increased in the case of Czech Republic. In Hungary they decreased by 50%, and in Slovakia even more. In Poland the net CB flows position decreased slightly.

Table 3. Share of net bank cross-border changes in GDP (USD)

	1995–2019	1995–2008	2009–2019	2020–2022	2020	2021	2022
CZ	9.6%	4.6%	15.9%	23.9%	24.6%	21.8%	25.2%
HU	24.5%	24.0%	25.1%	13.4%	12.5%	15.4%	12.3%
PL	8.8%	3.2%	15.9%	9.0%	9.4%	8.9%	8.7%
SK	13.5%	10.5%	17.3%	4.0%	4.2%	3.9%	4.0%

Source: Author's calculations; BIS data; data for 2022 cover first two quarters

The existance of cointegration between the bank cross-border position and GDP must be taken into account, particularly when considering changes in credit expansion over the last few years. The European financial sector, thanks to post-GFC recovery and the active support of central banks, was not infected by the pandemic. This was reflected in the credit activity in the V4 (Table 4). As can be noticed, the average of credit impulse in 1998–2019 was similar. The biggest differences are observed within the last three years.

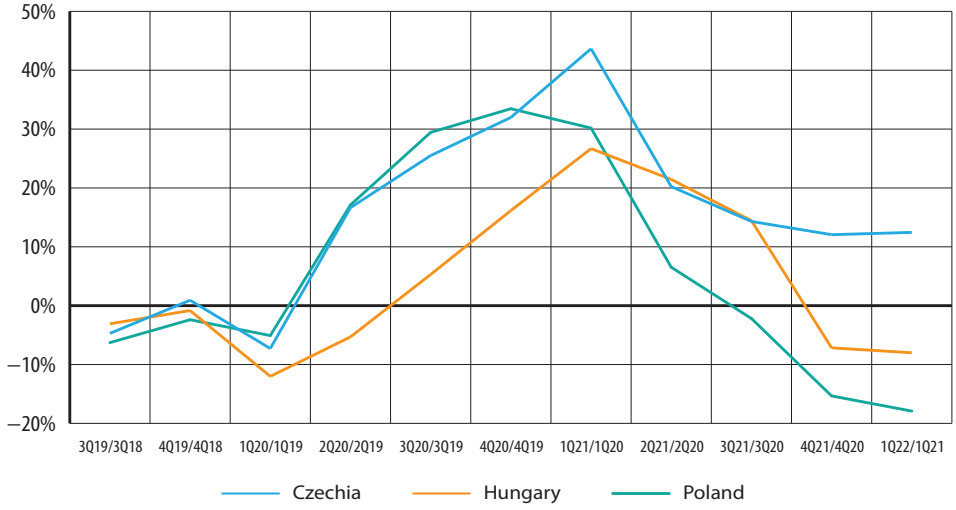
Table 4. Average credit impulse in Poland (%GDP)

% GDP		CZ			HU			PL	
average	NFS	GG	Banks	NFS	GG	Banks	NFS	GG	Banks
1998–2019	110.4	32.9	41.1	161.4	70.5	40.3	112.5	49.0	40.4
1998–2008	91.4	24.1	32.6	136.6	61.0	36.5	89.9	43.4	28.6
2009–2019	128.2	41.1	49.0	184.5	79.5	43.9	133.1	54.0	51.3
2000–2021	127.6	40.7	52.9	167.9	76.4	36.4	135.3	56.6	48.5
change	NFS	GG	Banks	NFS	GG	Banks	NFS	GG	Banks
2019–2020	3.2	6.3	1.8	19.3	10.7	5.5	8.3	9.5	–2.7
2021–2022	–2.7	–0.1	0.5	–6.3	–11.4	–1.1	–17.8	–11.4	–4.4

Source: Author's calculations; BIS data; NFS — non financial sector, GG — general government, Banks — credit to private non-financial sector from Banks

Up until 2019 the credit impulse in non-financial corporations and in general government rose in the Czech Republic, Hungary and in Poland. Similarly, credit to the private non-financial sector increased substantially. At that time, cointegraion between CB flows and GDP played an important role in all V4 countries. The pandemic crisis, causing lockdowns in most countries, seriously affected the real economy. Economic activity during the pandemic was stimulated by fiscal policy and supported by banks financing public expenses. It also increased the role of credit in the economy. But this shock forced, especially governments, into making a swift and strong response to protect vulnerable sectors. A particularly strong credit impulse in the general government sector was observed in Hungary, but it was also significant in Poland. The dynamics of general government debt diminished in subsequent quarters as a result of tensions in public finances (Figure 7).

Figure 7. Quarterly changes of outstanding debt issued by the public sector in Czech Republic, Hungary and Poland



Source: Authors calculations, BIS data

It becomes apparent that the shock that affected the V4's GDP in 2020 did not result from or cause dramatic changes in net capital flows. However, it did lead to significant changes in the structure of loans issued to the non-financial sector. An increase in the involvement of the financial sector in financing the public sector was observed (Table 4). This is related to the protective measures introduced for the real sector by the financial authorities — monetary and fiscal. But the falling share of CB positions in GDP during 2020–2022 in all the V4 countries (except for Hungary), accompanied a falling credit impulse and falling GDP dynamics. As CB flows, which indicate financial competitiveness of the economies, were cointegrated with the V4's GDP, a revival of banking activity in the private non-financial sector could be essential for sustaining long-term growth. Meanwhile, a small or even declining share of bank crediting went to the non-financial sector.

Conclusions and recommendatons

This chapter demonstrates that cointegration between foreign and domestic capital flows was present in all V4 countries. This means that domestic net capital flows are in the long-term strongly related to changes abroad. Particularly important is the long-term dependence of the current account of the V4 countries on changes in the euro area current account. Hungary is an exception in this regard.

When it comes to internal relationships, in all V4 countries the co-integration coefficient between GDP and their current account and CBF was statistically significant in both periods 1995–2019 and 2009–2019. In the case of Poland, the coefficient indicates a fairly strong relationship between GDP and the current account. In the remaining countries, there is no clear direction of these relationships, as the coefficients indicate the oscillation of these two variables around the equilibrium, suggesting much longer than a year adjustment period. This specific structural feature will be an important condition for GDP growth in the post-pandemic and energy shock period, more in the long than in the short term. Assuming that the cointegrations which existed up to 2019 continue, this feature could be accommodating for the restoration of sustainable development, provided that the net capital flow dynamics recorded up to 2020 are maintained. However, the net capital flow changes recorded in 2021 and 2022 are not clear. If the pandemic shock causes a downward trend in the balance of payments, then a growing deficit may deter growth, especially in the medium term. In turn, if prior cointegration between net bank cross-border flows and GDP continues, the present dynamics of the CBF in the Czech Republic and Slovakia will support their GDP growth rate. In the case of Poland and Hungary, if the observed decline in the bank net cross-border position continues, it will make GDP growth progressively dependent on domestic financial sources.

It is too short a time to assume that cointegration between net capital flows and GDP was broken by the pandemic and energy crisis (causing structural changes in the Main Street sector). Should the existing cointegration be broken as a result of these shocks, the relationship between capital inflow and GDP will change. Growth of GDP both in the short and long term may require an increase in the share of non-residents in financing government expenditures in foreign currencies and an increase in foreign capital imports (current account deficit deepening).

Should the cointegration between GDP and the net inflow of foreign capital continue, then the decline in the inflow of cross-border flows and the deepening deficit in the balance of payments will hamper growth in the long term. From the recent data presented above, it can be seen that so far these crises have (1) inhibited lending to private non-financial enterprises (measured as a share of GDP), and (2) caused a build-up of the trade deficit. If the level of financial integration, measured by the flow of cross-border capital of banks further decreases, it will appear as a significant factor hampering growth, especially in conjunction with the dynamic increase in current account deficits. Since the credit exposure of the public sector can increase as a result of COVID emergency support programmes, investment plans (climate, energy, defence spending) or attempts to limit the inflation, this will limit the credit exposure of the domestic financial sector to private enterprises. Effectively, this may have long-term effects for investments as the public sector will displace the private sector from the credit market. If negative changes in the dynamics of the current account occur and/or the decrease in net cross-border flows

continues, a further increase of issuance of domestic credit (public or semi-public) could have negative consequences for future financial stability.

When presenting the above conclusions, it is necessary to point out the research limitations that allowed only some general long-term relationships between capital flows and GDP to be identified. More in-depth research on the relationship between capital flows and growth in the period preceding the current shocks (overlapping effects of COVID, war in Ukraine, climate change) should cover gross flows such as FDI, debt or gross inflows of bank flows. Such additional research would enable more specific recommendations for economic policy. The study of long-term relationships between capital movements in GDP should also be supplemented with a parallel estimation of short-term relationships (Błaszczuk & Sawicki, 2017). In turn, when exploring long-term relationships, it would be important to examine the sensitivity of the existing cointegration to changes in the periods for which this relationship is estimated, while a panel study for the V4 or other cross-sections would show the occurrence of common trends and dependencies for the selected population.

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Biographical note

Janusz Bogdan Sawicki received a PhD in international trade theory in 1977 from the Faculty of International Trade, Warsaw School of Economics, where he subsequently worked as an assistant professor at the Department of Planning and Foreign Trade. From 1980 he was employed at the Ministry of Foreign Trade, after which he served as an Undersecretary of State at the Ministry of Finance. There he was responsible for Poland's foreign finances, including negotiations with creditors from the Paris Club and from the London Club. In 1991, as a government plenipotentiary, he signed an agreement with the Paris Club concerning Poland's debt reduction. A private entrepreneur since 1992, he has also worked at IKCHZ, a think tank focusing on international trade (later renamed IBRKK). He has published numerous analytical works as well as research papers, which have been published, among others, in National Economy, Ekonomista, Wspólnoty Europejskie as well as edited volumes. Among his key contributions is the book "Economic and Monetary Union — road to a debt trap" concerning the importance of debt for sustainable development. His research interests include the country's external financial equilibrium, balance of payments and game theory in credit negotiations.

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Excess Death Rate in Eastern European Countries and Countries of the Former USSR during the COVID-19 Pandemic in the Years 2020 and 2021

Abstract. Measuring the impact of the COVID-19 epidemic on mortality on the basis of deaths reported by statistical offices by cause may be challenging due to the often poor quality of data. Therefore, this study analysed the level of excess mortality, regardless of the cause, to measure the true impact of the epidemic on the number of deaths. The analysis focused on selected countries from Eastern Europe, the Caucasus and Central Asia as well as the Russian Federation, and was limited to the period 2020–2021. Time series analysis methods were used in order to account for seasonal fluctuations in mortality throughout the year. It was determined that some of the studied countries were "blind" to the development of the coronavirus epidemic in selected periods. The findings from this study allow the true scale and extent of the COVID-19 epidemic to be assessed correctly. Taking into account excess deaths would lead to substantial increase in the number of deaths attributed to the COVID-19. In the case of the 19 countries surveyed this number should be increased from the level of nearly 800,000 officially reported deaths to over 2 million excess deaths. The actual scale of deaths experienced during the COVID-19 pandemic has had grave ramifications both for society and various sectors of the economy

Keywords: pandemic, excess deaths, mortality, Eastern Europe, Caucasus, Central Asia

JEL classification: C5, I1, J1

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1. Introduction

In early 2020, a new virus, SARS-COV-20, which causes the acute respiratory system illness COVID-19, spread first in China and then in other parts of the world. In Europe, the first recorded outbreaks of this virus occurred in Italy, where on February 21 the first confirmed COVID-19-related death was recorded (Blangiadro et al., 2020). As early as March 21, the World Health Organisation announced a global pandemic, though at that time most confirmed deaths were being registered only in China (WHOa, 2020). During subsequent months, the pandemic triggered a health-related, social and economic crisis in many countries of the world, which gravely affected people's lives worldwide. In the

light of official statistics, by the end of 2021, nearly 300 million infections and 5.5 million confirmed deaths had been recorded globally (Coronavirus Resource Centre, 2021). State governments implemented a variety of non-standard measures, initially to limit the spread of the disease and then to mitigate its economic consequences.

The COVID-19 pandemic forced authorities in many countries to constantly update the monitoring of the development and consequences of the disease in the form of, inter alia, daily infections and numbers of deaths — statistics which allowed the assessment of the pandemic's scale in particular countries. However, precise measurement of the pandemic's intensity through an analysis of only directly reported COVID-19-related deaths is in some countries hindered on account of the fact that the official data may understate the total number of the virus's victims. As a consequence, the official COVID-19-related-deaths statistics may be unreliable, which is shown in the findings of some studies, e.g. in Great Britain, where analyses of the level of excess deaths, excluding COVID-19-related deaths, display a rapid increase in deaths caused by dementia and other erroneously defined illnesses which may have partly resulted from undiagnosed COVID-19 cases in which the virus exacerbated the earlier condition (Raleigh, 2020). The numbers of reported infections and deaths may also have been affected by the reporting policy and a given country's testing capability (in particular the availability of tests whose shortage was reported early on), which may additionally hinder comparative studies among countries. Some countries only examined patients requiring hospitalisation, others recommended examining every person who showed symptoms, irrespective of the need for hospital care. There are also countries which have still not implemented mass testing (Silva, Jardim and Brito dos Santos, 2020). Furthermore, statistical offices may vary in their ability to store information correctly and may apply different methods of registering causes of death. States identify causes of death in various ways, in accordance with their own domestic terminologies. This affects the comparability of international-statistics as different countries have adopted different COVID-19-related-death definitions, i.e., some of them register only confirmed COVID-19-related deaths, whereas others also include those cases where the disease is only suspected. Some governments may also have purposefully concealed some information (Danilova, 2020). Studies indicate that many countries have understated the numbers of COVID-19-related deaths, suggesting that the figures may have been at least 1.6 times higher than those reported (Karlinsky and Kobak, 2021). On account of these limitations, a detailed analysis of the level of excess mortality, irrespective of cause of death, was carried out for the needs of the present study, attempting to measure the pandemic's actual impact on mortality figures in selected states.

The course of the COVID-19 pandemic differed in many countries in terms of territorial coverage, duration and the extent to which they were affected. The present study aimed to assess the levels of excess deaths during the COVID-19 pandemic in Eastern European countries and countries formerly constituting part of the Soviet Union, Russia

in particular. The notion of Eastern Europe is not unequivocally defined and, depending upon the classification adopted, may include various countries. Therefore, the UN's specification was adopted for the purpose of the study, which includes Belarus, Bulgaria, Czechia, Moldavia, Poland, Romania, Russia, Slovakia, Ukraine and Hungary. The list of the states examined was also extended by the inclusion of former USSR republics, such as Uzbekistan, Kazakhstan, Georgia, Azerbaijan, Lithuania, Latvia, Kirgizstan, Armenia and Estonia (Tajikistan and Turkmenistan were omitted on account of lack of data). It was found on the basis of the author's earlier studies that the statistics of the detectability of COVID-19-related deaths clearly deviated from other countries of Europe and the world (Murkowski, 2022). In the light of the findings it may even be claimed that some of the countries under investigation were, in the periods of time covered in the study, more or less 'blind' to the spread of the coronavirus pandemic. Hence, another aim of the study was to find to what extent COVID-19-death statistics are understated and then to thoroughly analyse this issue in selected cases and to attempt to identify the causes of the differences in this regard. The relation between the number of excess deaths estimated by the author and the officially reported number of COVID-19-related deaths was used for this purpose. The pandemic has hugely affected and will continue to affect social, cultural and economic processes, e.g. it has slowed the pace of economic growth, particularly in the year 2020. Thus specifying its actual extent and impact on demographic processes should constitute the starting point for further analyses in other areas.

2. The notion and measurement of excess deaths

In compliance with the recommendations of World Health Organisation, COVID-19-related mortality should be shown broadly and it should include all likely or confirmed cases, unless there is a conspicuous alternative cause of death which cannot be related to COVID-19 (e.g. an injury). Furthermore, there should be no time-period of complete recovery from COVID-19 between infection and death. Those deaths should not be attributed to other diseases, e.g. cancer; they should be counted independently of previously existing illnesses suspected of triggering an acute course of COVID-19 (WHOb, 2020). Despite this, many states apply different methods of counting COVID-19-related deaths, which renders the data concerning pertinent deaths, published by different states, incomparable. In some countries, such as Italy, all infected deceased individuals are classified as victims of COVID-19, whereas in other states this may not be the case (Danilova, 2020). A similar situation concerns the number of confirmed COVID-19 infections because these statistics largely depend on test availability and testing policy. Therefore, in official statistics in different countries some COVID-19-related deaths may have remained undiagnosed and unreported e.g. owing to a shortage of tests or erroneous classification of this disease,

or possibly other causes. Therefore, a different death-rate measurement, which would be unaffected by the above-mentioned problems, should be applied for international comparisons. Thus, an accurate assessment of the pandemic's impact on the mortality rate should not only refer to officially registered COVID-19 cases and consequent numbers of deaths, but it should also allow for the total number of deaths regardless of their cause.

There is an academic consensus (Kontis et al., 2020; Beaney et al., 2020; Leon et al., 2020) which advocates that the most objective way of comparing numbers of deaths in different countries during the pandemic is an index that records the number of excess deaths, regardless of their cause. This index is also commonly applied by many countries' statistical offices, such as Eurostat, research organisations, international institutions, analytical organisations and leading publications, e.g. The Financial Times, The Economist or New York Times (Timonin et al., 2020). It is also highlighted in the literature that direct and indirect assessments of excess deaths during wars and epidemics have a relatively long history and the very notion of 'excess deaths' has been commonly used before (Beaney et al., 2020; Leon et al., 2020). Researchers in fields such as epidemiology or public health who assess the pandemic's impact on mortality use the notion of excess mortality which shows that mortality (regardless of cause) exceeds the level which would have occurred in standard conditions, i.e. in the case where the pandemic had never occurred (Vestergaard et al., 2020). Such an approach allows any potential misidentification of the cause of death, which can sometimes occur in medical institutions, to be disregarded. It also enables an accurate assessment of the real impact of the pandemic on mortality, both directly and indirectly, including those deaths attributable to other causes, such as disturbances in access to medical care in relation to other illnesses, in particular regions of a given country affected by the disease (Blangiardo et al., 2020).

Researchers who set out to estimate numbers of excess deaths caused by e.g. war or epidemic must calculate the difference between the observed and expected (in normal conditions) number of deaths (Checchi and Roberts, 2005). A positive value means that, in the given period, there were more deaths than in the referential period (Giattino et al., 2021). Excess mortality should be less than mortality only related to COVID-19 because the latter, in compliance with WHO guidelines, may include deaths not caused by COVID-19 but accompanied by this disease. The percentage of additional deaths in the examined time period relative to the referential time period is usually used as an excess mortality index. Excess mortality indexes enable the assessment of the general impact of the pandemic on mortality figures because they include not only the deaths of COVID-19-infected individuals but also undiagnosed ones and those whose death was indirectly caused by the pandemic, inter alia by reduced access to other medical-care services. During peak periods of the pandemic, temporary paralysis of the health-care system may occur and thus hinder access to medical care (ambulatory in particular),

which may also contribute to an increase in deaths related to causes other than COVID-19. Italy's experience from the initial stages of the pandemic points to the likelihood of near paralysis of local health-care due to the fact that most doctors were primarily preoccupied with COVID-19 patients (Cutler and Summers, 2020; Scortichini et al., 2020). In sum, excess mortality measures the number of extra deaths caused by all factors within a selected geographical area in comparison with what could be expected on the basis of experience of mortality in previous years. Such an approach clearly has its advantages: firstly, it is insensitive to differences in the practices of coding the cause of death; secondly, it encompasses not only infection-related deaths but also those indirectly caused by the pandemic, e.g. by limitations in the functioning of health care brought about by its intensity during critical moments of the epidemic's progress; thirdly, the sources of its estimation include commonly stored objective registration data, largely accessible in developed countries.

3. Method

In estimating excess-mortality levels, the most important challenge is to define the expected mortality in a given time period in such a way as if the pandemic were not to occur. The most often applied — owing mainly to its simplicity — method of estimating the expected number of deaths for an examined time period consists in calculating the historical mean on the basis of mortality figures from a few earlier periods (e.g. Docherty et al., 2020). However, such an approach does not allow for long-term mortality trends and does not take into account annual fluctuations in risk factors, such as weather (Scortichini et al., 2020). The estimation of the level of standard weekly (or monthly) absolute number of deaths in the period from 2020 to 2021 (or correspondingly a shorter period, depending on data availability) used the time-sequences analytical method which allows for weekly (these were available for Poland, Romania, Bulgaria, Hungary, Czechia, Slovakia, Lithuania, Estonia and Latvia) or monthly (for Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kirghizstan, Moldavia, Russia, Ukraine and Uzbekistan) seasonal fluctuations in the absolute number of deaths within the whole year, which enabled the seasonal impact of atmospheric temperature on mortality to be ascertained. In the study, an indicator method of extracting seasonal fluctuations of multiplicative character together with an analytically-designated trend was used; it may be represented by the equation:

$$y_i = (a + b \times t) \times S_{s_i} + S_y, \text{ where:}$$

a, b — parameters of linear function of total deaths number trend; t — time (corresponding quarter or month number); S_{s_i} — seasonality indicator designated for i-th quarter (or possibly month); S_y — random indicator.

For estimating seasonality indicators for weekly data with its calculation for the 53rd week of a given year, which does not always occur (in accordance with the adopted statistical terminology, the 53rd week occurred in the period under scrutiny only in 2015 and 2020) its calculation for the years 2016–2019, the mean for the 52nd week of the year under scrutiny and the 1st week of the next year were taken. The obtained results after estimating the standard total number of deaths for the years 2016–2019 displayed an estimation error for all the examined states amounting to 5.2% of mean value of the pertinent variable (from 2.3% for Russia to 7.1% for Estonia).

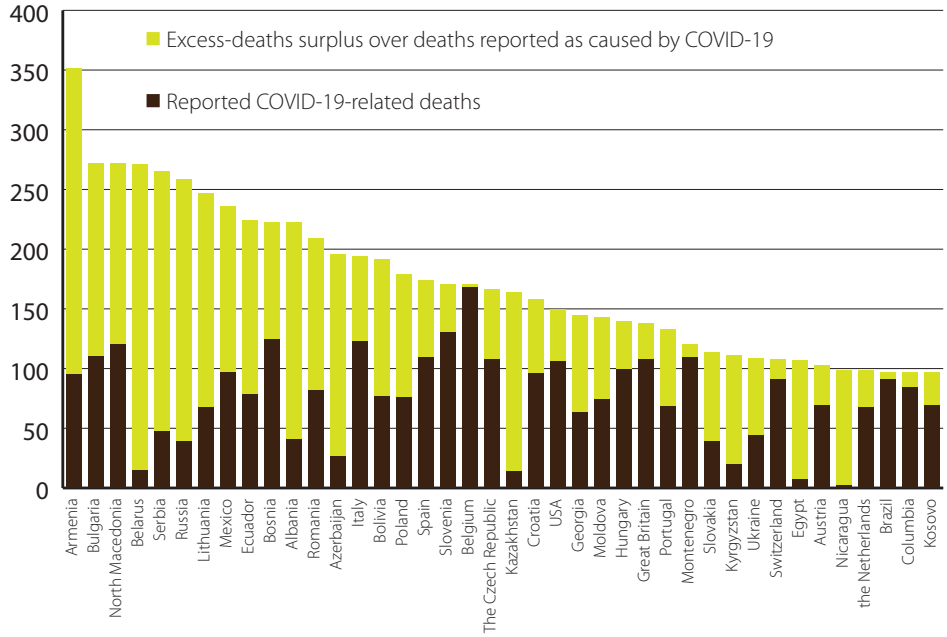
Other approaches to estimating the expected number of deaths can also be found in the literature, e.g. on the basis of the general mortality trend over recent years and seasonal fluctuations by means of the regression analysis method (Simonsen et al., 2005), the using the time series method (Németh, Jdanov and Shkolnikov, 2021), the ARIMA method (Nunes et al., 2011), Poisson's generalised linear model (Farrington et al., 1996) or on the basis of demographic prognosis taking into account the age structure of population changing over time (Karlinsky and Kobak, 2021).

The study applied data concerning the weekly (or monthly) total number of deaths published by Eurostat or other statistical offices from the data repository of the World Mortality Dataset (Karlinsky and Kobak, 2021) and data concerning infections and deaths caused by COVID-19, usually published by national health-care governmental institutions, stored in "The Johns Hopkins Coronavirus Center" database. The expected weekly (or monthly) numbers of deaths, regardless of cause, were estimated for selected countries of the world on the basis of these data. Then the observed number of deaths from January 2020 to the end of 2021 was compared to the predictions based upon these models and the number of excess deaths defined as the difference between the observed number of deaths and the number of deaths estimated on the basis of the model which would be observed in the case of the pandemic not occurring was specified. In order to calculate the numbers of excess deaths separately for the years 2020 and 2021, the weekly data were calculated for the last week of the year under scrutiny proportionately to the number of days in the given year. Furthermore, for the majority of the countries under examination the data for 2021 have an introductory character and are not complete; they may still be reviewed.

4. Findings

The findings of the study indicate that the level of coronavirus pandemic recognition largely depends on the time period (commonly referred to as coronavirus pandemic wave) in which it concerns — during the first stage of the pandemic's development in a given country fewer cases of both infections and related deaths are detected. Despite this, it is possible to identify countries in which COVID-19-related mortality statistics are

Figure 1. Forty countries with the highest number of excess deaths per 100 thousand people in 2020



Source: author's elaboration on the basis of Johns Hopkins Coronavirus Resource Center's and World Mortality Dataset's data.
Note: the level of excess deaths in appr. 80 countries was estimated in the study; the graph presents 40 states with the highest numbers of excess deaths per 100 thousand people. The brown bar expresses the level of daily reported COVID-19-related deaths in the whole year 2020. The green bar indicates the excess-deaths surplus over deaths reported as COVID-19-related in the year 2020 estimated by means of the econometric model.

significantly understated. In the light of the findings of the study (more than 80 countries whose data were available were subject to the scrutiny) it can be said that there are a group of countries which, in the pertinent time periods, were "blind" to the development of the coronavirus pandemic. It was found that Armenia suffered the highest level of excess deaths per 100 thousand people in the year 2020 (see Figure 1). It needs to be remembered at the same time that, when examining and analysing the data for Armenia and Azerbaijan, there was a war in Upland Karabakh towards the end of 2020 which, besides the COVID-19 pandemic, beyond doubt also contributed to excess mortality. The group of countries with a high number of excess deaths per 100 thousand people included mainly Eastern European states or former parts of the Soviet Union. At the same time, in these countries the level of reported COVID-19-related deaths significantly differed from the estimated number of excess deaths. For example, in Belarus only 15 COVID-19-related deaths per 100 thousand inhabitants were reported in 2020, whereas according to the estimated model of excess deaths in this country, the number, amounted to as many as 271 per 100 thousand people (see Table 1). In other Eastern European states or former Soviet states the differences between these two values in 2020 were equally large — e.g. in

Uzbekistan (2 and 43), Azerbaijan (26 and 196), Russia (39 and 268), Kirghizstan (20 and 111), Armenia (95 and 352), Lithuania (67 and 247), Slovakia (39 and 115), Estonia (17 and 33), Romania (82 and 210), Bulgaria (110 and 272). Similar differences were also observed in other countries of the world: in some Latino-American countries, such as Nicaragua, Mexico, Ecuador, Bolivia (but not all, e.g. Brazil or Columbia, see Figure 1) or in some African countries, such as Egypt (it needs to be remembered, however, that for most countries in this continent no reliable data exist).

Table 1. Number of excess deaths in Eastern-European and formerly Soviet countries during the COVID-19 pandemic in 2020 and 2021

Specification	Excess deaths		COVID-19-related deaths		Excess deaths		COVID-19-related deaths	
	01.01.2020 – 31.12.2020				01.01.2021 – 31.12.2021			
	1st, 3rd, 5th and 7th columns in thousands of people 2nd, 4th, 6th and 8th columns per 100,000 people							
Armenia	10,5	352,1	2,8	95,1	9,7[1]	326,8[1]	5,1	173,5
Azerbaijan	20,0	196,1	2,6	25,8	19,3[1]	189,0[1]	5,7	55,9
Belarus	25,6	271,1	1,4	15,1	8,0[2]	84,2[2]	4,2	44,0
Bulgaria	18,8	272,1	7,6	109,9	43,8	635,0	23,4	339,0
The Czech Republic	17,8	166,4	11,6	108,0	27,8[5]	259,5[5]	24,5	228,9
Estonia	0,4	33,2	0,2	17,3	3,4	258,0	1,7	128,5
Georgia	5,8	145,4	2,5	62,9	3,0[3]	76,1[3]	11,3	283,8
Kazakhstan	31,3	164,8	2,7	14,5	48,8[1]	257,0[1]	15,5	81,4
Kyrgyzstan	7,4	111,2	1,4	20,4	6,3[1]	95,0[1]	1,4	21,8
Lithuania	6,6	246,5	1,8	66,8	11,4	423,9	5,6	207,9
Latvia	1,2	65,7	0,6	34,0	7,1	378,7	3,9	210,8
Moldova	5,8	144,0	3,0	74,2	7,2[4]	180,1[4]	6,7	166,6
Poland	67,4	178,4	28,6	75,5	106,9	282,7	68,5	181,2
Russia	391,0	268,0	56,3	38,6	732,4	501,9	246,4	168,9
Romania	40,1	209,7	15,8	82,4	74,5[6]	389,7[6]	43,0	224,7
Slovakia	6,2	114,7	2,1	39,2	20,0[7]	366,8[7]	14,5	266,0
Ukraine	47,6	109,4	19,3	44,4	134,6[1]	309,6[1]	82,8	190,5
Uzbekistan	14,7	43,2	0,6	1,8	11,7	34,5	0,9	2,6
Hungary	13,5	140,3	9,5	99,0	28,2	292,8	29,6	307,7

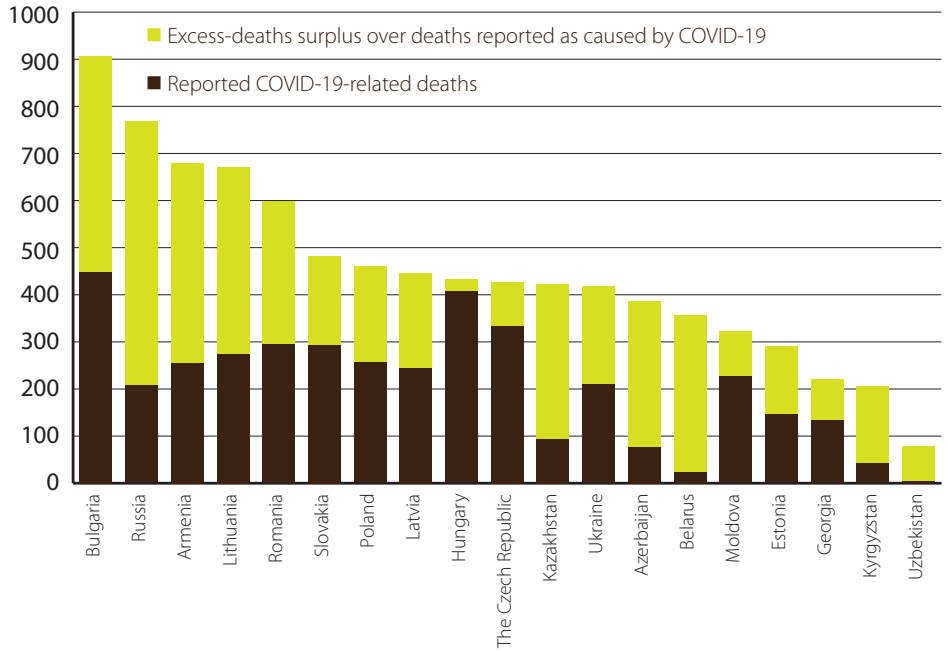
Source: author's elaboration based on Johns Hopkins Coronavirus Resource Center's and World Mortality Dataset's data.
Notes: [1]data for Armenia, Azerbaijan, Kazakhstan, Kirghizstan and Ukraine do not include December 2021, [2]data for Belarus do not include the period April–December 2021, [3]data for Georgia do not include the period July–December 2021, [4]data for Moldavia do not include the period October–December 2021, [5]data for Czechia do not include the 52nd week of 2021, [6]data for Romania do not include the period of the 48th–52nd week of 2021, [7]data for Slovakia do not include the period of the 51st–52nd week of 2021. Data for 2021 are of a preliminary nature and may be subject to review.

It seems that the course of the COVID-19 pandemic in many Eastern-European and former USRR countries has been described on the basis of unreliable COVID-19-related mortality data reported daily by their authorities. Such sizeable differences between excess mortality figures and reported COVID-19-related mortality figures may be accounted for in two ways: firstly, wrong identification of cause of death other than COVID-19, and secondly, an increase in mortality indirectly caused by the pandemic and the consequent limitations of some individuals to health-care services during spikes (Blangiardo et al., 2020). At the same time, it is unlikely that such a rapid increase in mortality figures should have resulted only from COVID-19-unrelated illnesses which directly or indirectly affected mortality, e.g. by overwhelmed health-care institutions, delays in the treatment of time-dependent diseases, such as stroke or myocardial infarction, etc. (Conti et al., 2020). Therefore, it seems more likely that in the majority of those states a large number of deaths must have been misidentified in terms of their cause, that is — COVID-19. Verifying these hypotheses will be possible after publishing full data concerning weekly or monthly data related to causes of reported deaths reported during the pandemic. Nevertheless, the analysis of solely COVID-19-related mortality statistics may lead to misleading conclusions as to the actual extent, course and scale of the pandemic. For instance, in the second quarter of 2020 relatively the highest level of excess mortality in all Europe was recorded for Eastern Europe, though the actual reported COVID-19-related mortality does not confirm this.

The ratio of excessive deaths to daily reported COVID-19-related mortality has also been calculated in the study. It should be pointed out that it is optimal if the ratio amounts to 1, for excessive mortality should equal or be lower than mortality caused by COVID-19 because it also includes other causes of death which could have increased during the pandemic. This indicator shows how many times higher the number of excessive deaths is than reported COVID-19-related deaths. High values of this indicator indicate that the daily reported COVID-19-related mortality data are unreliable and do not reflect the epidemiological situation in a given country. For example, the 2020 value of this indicator for Belarus, amounting to 18, means that the number of excessive deaths was 18 times higher than the reported deaths caused by COVID-19. It has been found in the study that the value of this indicator in Eastern-European and former USRR states was in many cases clearly higher than 1. In 2020 this indicator amounted to as much as 24 for Uzbekistan, 18 for Belarus, 11.4 for Kazakhstan, 7.6 for Azerbaijan, 6.7 for Russia, 5.4 for Kirghizstan, 3.7 for Armenia and Lithuania, 2.9 for Slovakia, 2.5 for Romania, Bulgaria and Ukraine and 2.4 in Poland. Amongst the Eastern-European countries under scrutiny the indicator for 2020 was low only in Hungary (1.4) and Czechia (1.5). In other regions across the globe high values of this indicator were also observed in Nicaragua (40.4), Egypt (14.6), Ecuador (2.9) or Lebanon (2.5). To a larger or smaller degree, in all the above-mentioned countries the statistics concerning the COVID-19 pandemic in 2020

did not reflect the actual epidemiological situation. Because most of these countries are Eastern-European or non-European but formerly parts of the USRR, they were subject to a detailed analysis in terms of statistics concerning excess deaths in 2020 and partly in 2021 (depending on data availability). For example, over 900 excess deaths per 100 thousand people were reported in Bulgaria for 2020 and 2021, while only half of that figure was reported as caused by COVID-19 (see Figure 2). In turn, as many as nearly 770 excess deaths may have occurred in Russia in the above-mentioned time-period, out of which only an average of 207 of the cases were attributed to COVID-19. In the case of Russia, similar results are also indicated by other studies in which it was found that by November 2020 the reported number of COVID-19-related deaths was in fact three times less than the actual number of deaths related to the pandemic (Kobak, 2021). The Belarus and Uzbekistan data turned out to be the least reliable in this respect; amongst all the excess deaths only a small percentage (a few cases per 100) was identified as caused by COVID-19. In turn, in Hungary nearly 94% of all excess deaths reported by December 31 2021 were identified as due to COVID-19.

Figure 2. Number of excessive deaths per 100 thousand people in 2020 and 2021



Explanations as with Figure 1
The data are not directly comparable because in the case of Armenia, Azerbaijan, Kazakhstan, Kirghizstan, and Ukraine they do not include the 12th month of 2021, for Belarus they do not include months 4–12 of 2021, for Georgia they do not include months 7–12 of 2021, for Romania they do not include the 48th–52nd week of 2021, for Slovakia they do not include the 51st and 52nd week of 2021. Furthermore, the 2021 data often have a preliminary character.

The absolute number of all excess deaths in the countries under scrutiny was highest in Russia, where in 2020 approximately 391 thousand deaths more than usual were reported, which gives a mean of 268 excess deaths per 100 thousand people (see Table 1). However, other researchers have estimated the level of excess deaths in Russia in 2020 to be 244 according to one method and 189 according to a different one (Timonin et al., 2020). Comparing only the number of deaths in Russia in 2020 to the previous years shows the scale of excess mortality: in 2020 the number of deaths in Russia amounted to 2.14 million, whereas in the years 2019 and 2018 appr. 1.8 deaths were reported. It needs to be additionally pointed out that in 2020 only 56 thousand deaths were reported by Russia to have been caused by COVID-19, which equalled less than 12% of all excess deaths. By contrast, the USA reported in the same time-period, according to the author's estimation, nearly 690 thousand excess deaths, out of which nearly 605 thousand cases were identified as caused by COVID-19. The reliability of Russian data concerning COVID-19 has been questioned by many researchers (Oxenstierna, 2021), which could only have been justified by the country's insufficient testing possibilities at the beginning of the pandemic. Some researchers have even speculated about the deliberate manipulation of data concerning mortality in connection with political pressure or avoiding sending negative messages by bureaucrats. Others have pointed out that the most likely cause of this could have been the country's principles of disease classification, which are different from those of the WHO, in the light of which doctors more often identify co-existing illness as a cause of death different from COVID-19. Even if the patient's coronavirus test was positive, the death may be reported as caused by something else (Oxenstierna, 2021).

The subsequent year turned out to be yet more adverse for Russia in terms of mortality — the preliminary statistics show that in 2021 Russia saw the death of 2.4 million people, out of which 730 thousand may be regarded as excessive — on average 502 excess deaths per 100 thousand people. Considering the fact that currently the number of annual births in Russia amounts on average to 1.5 million, the year 2021 appears to have been the worst for the country in terms of birth rate since World War II, and population decrease may amount to as many as 1 million people less. Nonetheless, the official data in Russia for 2021 show the number of deaths caused by COVID-19 to be only 246.4 thousand, which constitutes less than 33.6% of all excess deaths. As already mentioned, the relatively low percentage of COVID-19-related deaths in Russia, and probably in part also in other countries of the region, is primarily the result of a particular approach to determining the cause of death. For instance, if cancer, atherosclerosis or diabetes complicate the course of illness caused by coronavirus infection, then in most countries COVID-19 is identified as the cause or one of the causes of death, whilst in Russia it is customary to point to only one main cause, and in those cases it is usually cancer, acute vascular disease and diabetes (Oxenstierna, 2021). In essence, such definitions of causes of death are contrary to WHO

guidelines. Similar or even less reliable pertinent statistics are also observed for other countries of the region, e.g. Belarus, Uzbekistan, Kirghizstan, Kazakhstan, Azerbaijan or Armenia, where at best one quarter of excessive deaths were classified as caused by COVID-19 (see Table 1). Whereas in Hungary or in Czechia most excess deaths during the time-period under scrutiny were classified as caused by COVID-19. In the case of Hungary, in the said period approximately 42 thousand excess deaths were registered, out of which 39 thousand were reported to have been caused by COVID-19. However, in the case of Czechia over 45 thousand excess deaths had been registered by the 51st week of the year 2021, out of which nearly 36 thousand were reported as deaths caused by COVID-19.

Equally high excess-death statistics in the examined time-period occurred in Ukraine and Poland. In Ukraine, by November 2021 over 180 thousand excess deaths had been noted (mostly towards the end of 2021), out of which only a few more than 100 thousand were identified as related to the pandemic. The highest number of excess deaths occurred in Ukraine during the so-called 4th coronavirus wave, that is — during the last months of 2021, when mortality was as much as 80% higher than historically. In turn, in Poland the 2nd wave of the pandemic turned out to be the most adverse; the number of excess deaths by around the 45th week of 2020 was over 100% higher than historically. In the light of preliminary estimations, by the end of 2021 over 170 thousand excess deaths had occurred in Poland (the biggest number recorded at the end of 2020), out of which almost 100 thousand were identified as caused by COVID-19.

Considering mortality per 100 thousand people, Romania, Bulgaria and Lithuania fared very badly. Bulgaria noted high mortality statistics during the 2nd wave (in the 49th week of 2020 the number of deaths was nearly 130% higher than usual), the 3rd wave (in the 13th week of 2021 the number of deaths was nearly 130% higher than usual) and the 4th wave of the coronavirus pandemic (in the 44th week of 2021 the number of deaths was almost 107% higher than usual). This being the case, over 63 thousand excess deaths had occurred in Bulgaria by the end of 2021, out of which only 50% were registered as COVID-19-related, which constituted a total mean of 900 deaths per 100 thousand people in the time-period examined — the highest value amongst all the countries under scrutiny. In turn, the 4th wave of the pandemic proved the worst in Romania, where from the 41st to the 44th week of 2021 approximately 130% deaths more than usual were registered. As a result, in the light of the study, from 2020 until the 47th week of 2021 the number of deaths was higher by 115 thousand than normal, out of which 50% were reported to have been caused by COVID-19. In the Baltic states, Lithuania noted the worst mortality statistics; as many as 18 thousand people more than usual had died there by the end of 2021, thus since 2020 on average over 670 excess deaths per 100 inhabitants than usual had occurred there.

By contrast, the course of the pandemic in Kazakhstan, Uzbekistan and partly in Kirghizstan was different from that in Europe because the excess-mortality peak inci-

dence both in 2020 and in 2021 occurred in July and August. The pertinent statistics were also unfavourable in Kazakhstan, where mortality in July 2020 and August 2021 was correspondingly over 140% and 130% higher than normal. By only comparing the number of deaths in 2020 and 2019 one can see the scale of excess mortality in this country: in 2020 the number of deaths in Kazakhstan was 162 thousand, whereas the figure for 2019 was only 133 thousand. By November 2021over 80 thousand deaths more than normal had been registered in Kazakhstan, of which less than 18 thousand were reported as caused by COVID-19. This notwithstanding, Kazakhstan would note a clearly positive birth rate on account of high fertility levels — over 425 thousand children were born there in 2020. This is why the scale of the demographic crisis in this country will be incomparably smaller than in the other countries under examination. In the case of Azerbaijan and Armenia, excess-mortality spikes fell at the end of 2020 — in Azerbaijan there were as many as 200% more deaths in December than at normal times, while in Armenia November saw a 184%-rise relative to usual mortality. It seems, however, that it was not the pandemic that caused the increase in mortality there, but rather the war being waged between these two countries in Nagorno-Karabakh.

5. Discussion and conclusions

Summing up, in the light of the model's estimation, all the countries under examination had recorded over 2 million excess deaths by the end of 2021, of which 1.1 million occurred in Russia, though less than 40% of this figure was attributed to COVID-19. It seems that in some countries (primarily Eastern-European and former USRR countries) the course of the pandemic can be characterised by a large proportion of excess deaths, while only a relatively small number of them were reported as related to COVID-19. Identifying the states which understated the cause of mortality during the pandemic will enable a correct estimation of its scale and reach on the basis of examining excess mortality regardless of cause. Using only the statistics concerning reported COVID-19-related deaths in those countries for this purpose may be misleading with respect to the pandemic's development there. Nonetheless, in journalistic discourse one may sometimes observe an attempt to question the endeavour to estimate COVID-19-related mortality on the basis of analysing only excess deaths regardless of their cause. To illustrate this, it is contended that inhibitive measures applied in many countries (particularly in the initial stages of the pandemic's development) may have lowered the baseline mortality owing to lowering mortality due to such factors as e.g. car accidents, which would mean that the actual mortality related to COVID-19 could even surpass these estimations. Others point out that the inhibitive measures may have raised baseline mortality due to lack of exercise, economic difficulties or chronically ill patients' limitations in access to health-

care services, which in turn means that the actual COVID-19-related mortality may have been lower than excess-mortality estimations, although the findings of some studies suggest that none of these possible causes related to inhibition had a statistically significant impact on excess mortality — see e.g. analysis of variation in regional mortality in Russia (Timonin et al. 2020). One should therefore accept the statement that estimating COVID-19's impact on mortality on the basis of examining excess mortality regardless of cause is the only feasible objective solution which allows the full impact of the pandemic on mortality to be recognised, especially in countries whose statistics concerning causes of deaths are of questionable quality. Ideally, registered COVID-19-related mortality and mortality surplus should be on more or less the same level. However, on account of the low quality of the statistics concerning causes of deaths, discrepancy between legislative solutions concerning identification of cause of death or even deliberate manipulation of statistical data, these statistics often differ. Thus, applying excess mortality data for determining the COVID-19 pandemic's impact on mortality is by far a more objective and reliable approach.

The analysis has shown that a relatively low proportion of deaths caused by COVID-19 in the countries under scrutiny may have resulted from a special approach to identifying cause of death, i.e. owing to certain peculiarities of statistical accountancy. Nevertheless, the numbers of excess deaths, regardless of cause, allows an objective overview of mortality in those countries. There are also other countries that have been accused of understating COVID-19-related-deaths figures, e.g. Turkey, Iran, India, Brazil, Venezuela, Nicaragua and Mexico. If one were to take into account excess-mortality statistics, the figures in global databases would rise significantly. The data from the 19 examined countries alone indicate that the global COVID-19-death related statistics for the time-period under examination should be corrected by 1.2 million deaths — from approximately the 800 thousand reported deaths caused by COVID-19 to over two million excess deaths.

The method of calculating expected mortality as if the pandemic had not occurred is of key importance in assessing the size of excess mortality. For this purpose modelling time series taking into account seasonal fluctuations was used in the study. One of the limitations of the approach adopted was the fact that the extrapolation of excess mortality over an extended time-period (e.g. 3 years or more) may be reduced and marked by high risk of error. It seems that in such a case changes in population-age structure need to be taken into account to a greater extent, including those resulting from the pandemic and their impact on standard mortality. In addition, estimating expected mortality by means of the method applied in the study has certain limitations in small populations, where one may observe significant fluctuations of a random nature which may affect the quality of the resulting estimations. Nevertheless, for most of the countries studied, comparing the obtained excess-mortality estimations with the findings of other studies (see e.g. COVID-19 Excess Mortality Collaborators, 2022) did not demonstrate significant

differences. Thus, a group of scientists (COVID-19 Excess Mortality Collaborators, 2022) obtained very similar excess-mortality estimations for 2020 and 2021 for Russia, which amounted to 1.070 thousand deaths against the 1.123.4 thousand obtained in the present study (equally similar findings were obtained e.g. for Czechia — 49.1 against 45.6 correspondingly, Lithuania: 20.0 against 18.0; Romania: 119.0 against 114.6, or Ukraine: 181.0 against 182.2), although relatively bigger differences were recorded for Poland (214.0 against 174.3), Estonia (5.6 against 3.8), Bulgaria (82.5 against 62.2), Latvia (12.4 against 8.3) or Hungary (53.8 against 41.7).

A correct assessment of the pandemic's extent by e.g. assessing its actual impact on mortality figures should be the starting point for many other studies, those of a demographic character in particular, in which demographic processes are of vital importance. Initially, reactions to the pandemic's development in the individual countries were quite significant; various restrictions and limitations were introduced, which significantly reduced business activity, international economic cooperation, or the supply of and demand for certain goods. The impact of the pandemic was felt most severely by enterprises which were forced by authorities to limit their business activity, particularly in gastronomy and accommodation, tourism, culture, education or recreation and entertainment. The other sector of the economy directly affected by the outbreak of the pandemic was the NHS, whose overload of patients may also have translated into increased mortality. It seems that in the long run the pandemic will also adversely affect the NHS by engaging a share of its resources in treating its long-term consequences. It would be a future task worthwhile undertaking to investigate the pandemic's consequences for the health-care system and ways of financing it in the context of better efficiency of public funds involved in health care. Nonetheless, one should also bear in mind the fact that the pandemic has contributed to long-term beneficial economic changes. This may be exemplified by accelerated digitisation, automatisation and robotisation in certain sectors, or the permanent use of online work in certain areas, even after the pandemic had passed. Furthermore, the majority of COVID-19-related deaths concerned people aged 60 and older, which in the long run may turn out to be beneficial for pension systems or even the NHS. For instance, in the light of the author's other findings, in 2020 in Poland nearly 91% of excess deaths concerned people aged 60 and older (Murkowski, 2021), which is likely to reduce public insurance spending in the years to come by approximately 20 billion PLN relative to earlier prognoses (Murkowski, Szczyt, 2022).

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This edited volume discusses a wide range of COVID-19 related developments and their consequences for the economy. The topic is timely and individual chapters showcase the effects of the pandemic in diverse geographic settings (Eastern Europe, the former Soviet Republics, the USA vs China), segments of the economy (SMEs, communes, global value chains, international trade or FDI flows) and at different policy levels (local or central). The publication demonstrates a number of advantages which include its timing, multi-faceted approach and coverage of a wide range of the pandemic's consequences. Readers may find inspiration in area specific recommendations but should also be encouraged to compare and contrast the presented evidence and recommendations with other fields. The publication can be seen as a fully successful first step in examining COVID-19 and its vast range of consequences for the economy. While the first step always seems to be the most difficult, it serves as an inspiration for others to follow.

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