NIER

National Institute for Economic Research

ECONOMY and SOCIOLOGY

THEORETICAL AND SCIENTIFIC JOURNAL
founded in 1953

No.1 June 2023

ISSN: 2587-4187
E-ISSN: 2587-4195
Category „B+"

Chisinau, 2023

NIER

National Institute for Economic Research

ECONOMY and SOCIOLOGY

THEORETICAL AND SCIENTIFIC JOURNAL

founded in 1953

No. 1
June 2023

ISSN: 2587-4187
E-ISSN: 2587-4195
Category „B+”

Chisinau, 2023

EDITORIAL BOARD:

The journal „Economy and Sociology" is recognized as scientific publication, accredited of „B+" category by Decision of the National Agency for Quality Assurance in Education and Research of the Republic of Moldova, No. 8 of June 26, 2020.
The journal is indexed in the following international databases: DOAJ IDEAS, EconPapers, LogEc, SOCIONET, INDEX COPERNICUS, OAJI, RePEc, EZB, IBN, eLIBRARY.RU, CROSSREF.

Indexer and bibliographic editing: S. Gorceag. A, Catana, N. Dalinitchi, O. Chirilov, E. Migunova.

CONTENTS

CUPRINS

СОДЕРЖАНИЕ

A TRANSNATIONAL EXCHANGE MECHANISM AMONG MOLDOVAN MIGRANTS IN THE PARISIAN REGION: EXPLORING THE "POST OFFICE OF MOLDOVA"

DOI: https://doi.org/10.36004/nier.es.2023.1-01
JEL classification: F19, F22, F24, J19
UDC: 314.15+316.472](478)

Dorina ROȘCA,

PhD in economics, Assistant Professor, American University of Moldova
Associate Researcher at Laboratory of Social Dynamics and Spatial Reconstruction,
French National Centre for Scientific Research, France

https://orcid.org/0000-0002-3195-3256
e-mail: dorina.rosca@americanuniversity.md

Received 2 February 2023
Accepted for publication 25 May 2023

SUMMARY

This article delves into the phenomenon of material goods circulation in the context of international migration, specifically looking at the exchange of parcels between Moldovan immigrants in the Paris region, France, and their kin, friends, and acquaintances in Moldova. The analysis uses field data collected during an ethnographic study conducted in 2017 within the Moldovan immigrant community in Paris. It moves beyond the limitations of push-pull theories that focus solely on one-way material circulation from immigrants to their home country families or only on the economic implications of remittances.

Adopting a diverse methodological and epistemological stance, the author's inductive approach highlights the heuristic value of the field data. This data suggests that the parcel exchange between Moldovan immigrants and their compatriots carries significant social and symbolic meaning for all actors involved in this process. Over time, this exchange has evolved into a social institution, creating an ongoing link between the host country and the country of origin. The author scrutinizes the material and symbolic processes involved in the parcel transfer mechanism, whimsically referred to by the migrants as "Post Office of Moldova", the name of the national postal service in Moldova. The article explores both the commercial and non-commercial dynamics that shape this mechanism's operations and its integrative impact on the Moldovan immigrant community in the Paris region. The motivations that drive these material flows associated with migration are portrayed in terms of reciprocity, redistribution, and altruism, thereby emphasizing the reciprocal nature of these exchanges.

Keywords: *material circulation, migration, reciprocity, social exchange, parcels, transnational networks, Moldova*

Articolul de faţă analizează fenomenul circulaţiei materiale asociate migraţiei internaţionale, prin prisma schimbului de colete între imigranţii moldoveni din regiunea pariziană, Franţa, şi rudele, prietenii şi cunoştinţele lor din Moldova. Mobilizând date de teren colectate în cadrul unui studiu etnografic efectuat în 2017 în rândul comunităţii de imigranţi moldoveni din regiunea pariziană, articolul de faţă depăşeşte teoriile de tip push-pull, ce se focalizează exclusiv pe circulaţia materială unilaterală, dinspre emigranţi spre familiile lor din ţara de origine, sau doar pe valoarea economică a remitenţelor.

Pornind de pe poziţii metodologice şi epistemologice diferite, demersul autoarei este unul inductiv, ea punând accentul pe virtuţile euristice ale datelor de teren. Acestea sugerează că schimbul de colete dintre emigranţi şi apropiaţii lor din Moldova au o valoare socială şi simbolică importantă pentru toţi actorii ce participă la acest schimb. De-a lungul timpului, schimbul de colete ia forma unei instituţii sociale, care face legătura între ţara-gazdă şi cea de origine în mod continuu. Autoarea examinează procesele materiale şi simbolice implicate în mecanismul de transfer al coletelor, denumit de către migranţi, cu o doză de ironie, „Poşta Moldovei" – numele companiei naţionale de servicii poştale din Moldova. În articol, este analizată dinamica comercială şi non-comercială care încadrează funcţionarea acestui mecanism, precum şi impactul său coeziv asupra comunităţii de imigranţi moldoveni din regiunea pariziană. Motivaţiile ce alimentează fluxurile materiale asociate migraţiei sunt descrise în termeni de reciprocitate, de redistribuţie şi de altruism, accentuându-se caracterul bilateral al acestor schimburi.

Cuvinte cheie: *circulație materială, migrație, reciprocitate, schimb social, colete,rețele transnaționale, Moldova*

В статье представлены результаты исследования феномена обращения материальных товаров в контексте международной миграции, конкретно рассматривая обмен посылками между молдавскими иммигрантами в регионе Парижа, Франция, и их родственниками, друзьями и знакомыми в Молдове. Анализ основывается на данных, собранных в ходе этнографического исследования, проведенного в 2017 году в сообществе молдавских иммигрантов в Париже. Исследование выходит за рамки ограничений теорий push-pull, которые фокусируются исключительно на однонаправленном обращении материальных товаров от иммигрантов к их семьям на родине или только на экономических последствиях денежных переводов.

Принимая разнообразную методологическую и эпистемологическую позицию, индуктивный подход автора подчеркивает эвристическую ценность этнографических данных. Это предполагает, что обмен посылками между молдавскими иммигрантами и их соотечественниками имеет значительное социальное и символическое значение для всех участников этого процесса. Со временем этот обмен превратился в социальную институцию, создавая постоянную связь между страной принимающей и страной происхождения. Автор внимательно изучает материальные и символические процессы,

связанные с механизмом передачи посылок, который мигранты с юмором называют «Почта Молдовы», название национальной почтовой службы в Молдове. Статья исследует как коммерческую, так и некоммерческую динамику, которые определяют функционирование этого механизма, а также его интегративное воздействие на сообщество молдавских иммигрантов в регионе Парижа. Мотивации, которые стимулируют эти материальные потоки, связанные с миграцией, представлены в терминах взаимности, перераспределения и альтруизма, тем самым подчеркивая взаимный характер этих обменов.

Ключевые слова: *материальная циркуляция, миграция, взаимность, социальный обмен, посылки, транснациональные сети, Молдова*

INTRODUCTION

Moldova has witnessed a significant increase in migratory trends over the past three decades, indicating its escalating global integration. Nevertheless, the post-socialist reforms undertaken in the country have resulted in pervasive impoverishment, casting doubts on the legitimacy of the nascent state (Rosca, 2019). By 1999, over 70% of Moldovans were living in poverty, the GDP had plummeted to a mere 35% of its 1990 value, and the population was on the decline—a trend that persists today. According to a survey conducted in 2000 (IPP, 2000), 82% of respondents believed the country was turning in the wrong direction, 78% held trust solely in the Orthodox Church, and 55% expressed an aspiration to emigrate either temporarily or permanently. Between 2000 and 2005, approximately one-fifth of Moldovans sought employment opportunities overseas, culminating in a substantial influx of remittances that comprised 35% of the country's GDP level in 2006 (Luecke et al., 2007, p. 17). Official data suggest that around 10% of the population emigrated in the early 2000s—a figure that potentially doubles when considering undocumented emigrants. By 2007, estimates placed the number of Moldovan emigrants at about 700,000 (World Bank, 2011, p.55). By 2023, nearly one in three of Moldova's stable population of 3.5 million were living abroad for the majority of the year. Migration processes persist, and the population continues to reduce (Tabac, 2021; Gagauz, 2023). As per Tabac (2021, p.111), the population decline from 2014 to 2019 is estimated at around 7.9%. While Moldova's net emigration rates—calculated as the difference between the number of individuals entering and those leaving a country within a specific year, standardized per 1,000 inhabitants—fell to 14th place globally in 2018 (CIA, 2018), remittances continued to contribute significantly, constituting over 15% of the GDP value in 2021, with a recorded inflow of 2.17 billion US dollars in 2022 (World Bank Data, n.d.).

In parallel with Moldovan emigration, practices of social and economic exchange have developed, facilitating mutual support and individual solidarity at various levels. These practices include informal transnational crowdfunding platforms to aid migrants, peer-to-peer lending among migrant families, or parcel exchanges (Caracentev, 2020; Caracentev, 2022). Speaking about parcel exchanges, some quantitative data available, stemming from 2012 by NEXUS (Zwager & Șinţov 2014), hints at the sheer size of this phenomenon. According to these statistics, the average number of parcels sent daily to Moldova by migrants was estimated at 1,200. The monetary value of the contents of these parcels was projected to be around 43 million euros, approximately 5% of the monetary transfers from these migrants to their families. Hence, one can deduce that the average monetary value of one parcel sent by Moldovan migrants to their families was approximately 100 euros.

Such practices of material circulation have played a pivotal role in maintaining connections across borders. However, despite extensive research on these practices within broader European and transatlantic contexts, a scarcity of studies examining their implications in Moldova persists. Existing analyses often oversimplify the issue of material circulation, concentrating solely on unidirectional flows towards Moldova and utilizing rudimentary cost/benefit calculations. These calculations, rooted in neoclassical economic theory, are commonly used in migration studies to evaluate migration's positive (benefits) and negative (costs) effects on a specific country. As pointed out by Abdelmalek Sayad, the definitions of "cost" and "benefit" (where Sayad uses "profit" instead of "benefit") are subjective (Sayad 1986, p.79). This argument refers to numerous studies on Moldova conducted by international organizations such as the International Organization for Migration (IOM) or the International Agency for Source Country Information (IASCI). These studies typically focus on material circulation from emigrants to Moldova, often guided by *push-pull* theoretical constructs to shape public policy in Moldova. Despite their concentration on the inflow of monetary resources and goods due to migration and their inherent limitations, these studies still provide valuable statistical data on Moldovan migration. However, empirical evidence suggests a more intricate reality, where material circulation is multidirectional, connecting migrants both within and across countries, as well as with non-migrants in Moldova. The dynamics of this material circulation are deeply intertwined with moral, social, geographical, and transnational considerations.

In response to the identified research gap, this analysis is based on an empirical, qualitative study conducted with Moldovan immigrants in the Paris region between July and October 2017. The methodology incorporated ethnographic observation and biographical interviews – mainly focusing on the migratory episode – to broaden the analytical perspective and generate innovative hypotheses and concepts. This methodological framework included 18 in-depth interviews, with participants selected based on their involvement in the Moldovan immigrant community. The selection principles were designed to capture a diverse range of experiences, including various activities such as church gatherings, informal meetings, and collection drives for goods intended for Moldova. The research also involved participant observation at various collection points for migrant parcels. Observations and interviews were conducted during the specified period, and the data thus gathered were processed and analyzed to provide the empirical foundation for the study. All data were collected and handled with the utmost care for ethical considerations, anonymity, and privacy of the participants.

This analysis focuses on the bilateral flow of exchanges between migrants and their relatives or friends in Moldova. It begins by reviewing the literature on material and non-material circulations in migration studies (1), and then by presenting the data and methods used for this study (2). Lastly, the main results are presented in section three (3). This study aims to contribute to a deeper understanding of the multifaceted nature of material circulation and its implications in the Moldovan migration context.

LITERATURE REVIEW. MATERIAL AND NON-MATERIAL TRANSNATIONAL CIRCULATIONS LINKED TO INTERNATIONAL MIGRATIONS

The economic understanding of migration, specifically the push-pull models, has shaped the study of Moldovan migration (Cheianu-Andrei, 2013; Stöhr, 2013). This perspective focuses largely on the unilateral movement of individuals from poorer to wealthier nations and the circulation of money, goods, and services associated with migration (Tabac & Gagauz 2020). However, this model fails to explain why migration does not originate from all impoverished areas and why it is concentrated in certain affluent nations only (Portes & Böröcz, 1989; Massey et al.,1993, p. 428).

Moreover, the traditional economic understanding of migration (see for instance, Vaculovschi 2023) has overlooked certain nuances of the phenomenon, such as the parcel exchange process and the reciprocal exchange between migrants and non-migrants. The practice of sending goods, often packed in parcels from migrants to their families and friends back home, and the reverse flow of local products and symbolic items, from home to migrants, forms an important part of the migrant experience. This bilateral exchange, constituting both tangible and intangible cultural elements, plays a crucial role in maintaining familial and communal ties and helps migrants stay connected with their cultural roots (Caracentev, 2020).

Despite its significance, research on parcel exchange in the context of Moldovan migration remains scarce. Similarly, the dynamics of bilateral exchange, which could offer deeper insights into the complexities of the migrant experience, have not been adequately explored in Moldovan academic discourse. The lack of focus on these aspects in Moldovan studies highlights the need for more comprehensive and nuanced research approaches to better understand the multifaceted nature of migration. It underscores the need to move beyond the economic-centric approach and incorporate socio-cultural elements in the study of migratory processes.

Instead of adopting the conventional push-pull theories, some scholars suggest a more holistic approach that encompasses transnationalism (Schiller et al., 1995). This perspective sees the migrant as an active participant influencing both the host and origin societies. Portes et al. (1991), Tarrius (2002), Potot (2003), El Miri (2011), Pathirage & Collyer (2011), and Caracentev (2020; 2022) for the Moldovan case, all reflect this approach, effectively making migration phenomena epistemically objective (Sayad, 2014).

Alejandro Portes' works offer a unique perspective by introducing the concept of "globalization from below" which looks at the adaptations and innovations initiated by transnational communities in areas like entrepreneurship and transnational communication (Portes, 1999). These communities, created in the wake of the capitalist dynamic, often establish dense, geographically widespread networks to counter the uncertainty inherent in the migrant condition. Alejandro Portes' (1999) thesis on transnational communities posits: (i) their emergence and evolution are tied to capitalist dynamics; (ii) they diverge from traditional communities in structure and operation; (iii) they have greater internal growth potential than standard communities, owing to their ability to leverage resources and opportunities across national contexts, leading to synergistic growth effects.

Peraldi (2016) proposes a distinction between migratory logic and commercial routes. He introduces the idea of migratory commerce, a concept referring to an organization by various groups of migrants engaged in trade. He suggests a variety of mobilities, including tourist, migratory, and commercial activities, thereby portraying migration as part of a range of transnational mobilities.

Diminescu (2008) contributes to this discourse by arguing that 21st-century migrants are characterized by mobility and connectivity. This shift, facilitated by ICTs, gives rise to a "culture of surveillance." She challenges Sayad's notion of "double absence" (Sayad, 1999) by introducing the concept of "double presence", which emphasizes the importance of communication in the evolution of migrant practices.

Weber (2013) offers the concept of "regional cohesion of connections woven from below". He identifies cosmopolitanism as a form of transnationalism that functions as a class discriminator and argues that circulatory spaces and transnational communities are filled with multiple stratifications and social distances.

Lastly, Tarrius' (2002) mobility paradigm emphasizes the circulatory dimension of migration, advocating that migration is not a simple, unidirectional movement, but a complex, often cyclical pattern of human mobility.

The literature on migration offers various perspectives that redefine our understanding of the subject. Despite its dominant influence among Moldovan scholars, the push-pull model leaves several questions unanswered. Conversely, the transnational perspective, with its emphasis on the social structures and networks that shape migration, offers a more comprehensive understanding. Nevertheless, migration is a complex phenomenon, and no single theory can adequately encompass all its aspects. Therefore, this research aims to contribute to this field by examining the issue of material circulation within Moldovan migration, focusing on its economic, social, and cultural implications, echoing Annette Weiner's (1992) insightful analysis illustrating the capacity of objects to foster social relationships. This article will employ a multi-dimensional approach to this topic, moving beyond the limitations of the unidirectional logic of push-pull theories, and addressing the often-overlooked bilateral aspects of material circulation. Drawing on my field research conducted in Île-de-France in 2017, it is evident that material circulation, far from being unilateral, is integral to the lives of these migrants and their relationships with their families and friends back in Moldova. Thus, in this analysis, I will focus primarily on the bilateral dimension, even though my field data suggest that the material circuits might be more intricate. For instance, one of my respondents collected goods for children of Romanian ethnicity in Ukraine. Another respondent prepared a parcel of clothes and shoes, which were "in good condition and that [she] no longer wears," along with some French delicacies she sent to her sister residing in Dublin, Ireland.

By aligning with the transnational perspective, this paper aims to build upon the foundational work of scholars such as Portes (1999), Benarrosh-Orsoni (2016), Weber (2013) and Peraldi (2016). It will consider the transnational dimension outlined by all these works.

This research thereby reinforces the importance of recognizing economic phenomena as socially embedded realities deeply intertwined with complex social transnational structures. Here, individual economic activities are not isolated but reliant upon social elements such as trust, altruism, and the density and centrality of social groups. It further emphasizes the role of migrants as active transnational social actors, affirming their ability to influence and reshape both host and home societies.

In doing so, this paper hopes to provide a more nuanced understanding of the multi-faceted nature of Moldovan migration, specifically the bilateral material and non-material circulations.

DATA AND METHODS

THE FIELDWORK DATA: COLLECTION, ANALYSIS AND EXAMPLES

Data collection primarily utilized two techniques: i) narrative interviewing and ii) ethnographic observation. The narrative interviews enabled each participant to recount their experiences and perceptions of social and economic exchanges, with a particular focus on the practice of parcel exchanges. This technique proves particularly useful in understanding cultural and social phenomena from an individual perspective. Conversely, ethnographic observation offered a more in-depth understanding of the exchange practices, the emotions involved, and the social dynamics at play. In this context, I apply a broad and general definition to the term "exchange". This denotes the act of transmitting and reciprocating in return for goods, services, and various acts of politeness. The dynamics of such exchanges are not invariably concurrent or commensurate within an economic context. This clarification is critical to avoid any potential misconceptions concerning Polanyi's conceptualization of "exchange", which refers to a specific institutional arrangement.

Analysis of the collected data primarily consisted of thematic analysis, which facilitated a deeper exploration of the phenomenon. To provide a more nuanced understanding, I compared the experiences and perspectives from different interviews.

All fieldwork data collection was guided by ethical considerations inherent in such research methods. Consent was obtained from each respondent after ensuring they understood the purpose of the study, how the information would be used, and their right to withdraw at any time. Privacy and confidentiality were ensured by anonymizing all identifying information.

Below, I present a few examples from my fieldwork data that served as the foundation for the subsequent analysis.

I met Daniela[1] (29 years old, bachelor's in economics, accountant / cleaning lady) for an interview at Place de la Nation, in Paris. She has been in France since 2015. Her husband, aided by a few friends, arrived a few months before Daniela. At the time of their departure from Moldova, the couple's child was 3 years old. He stayed in Moldova with his maternal grandparents, and it was only a year and a half later, in 2016, that he joined his parents in France. If Daniela made an appointment with me at Place de la Nation, it's because she had "things to do in that area"; she had come to send some money – "not much, 75 euros" – to her retired parents, as well as a parcel containing laundry detergent – "here [in France], it is of better quality" -, a few cans of tuna, sweets "for the children of [her] sister", some coffee, "because in Moldova it is too expensive", and other "small things that cannot be found in Moldova".

On Sundays, after mass at the Orthodox church in Villeneuve-Saint-Georges, the parishioners share offerings. It's a good opportunity to socialize, exchange information about work, about bureaucratic procedures in the French administration, or even to make friendships. Usually, women walk around with trays of food (homemade cakes, buns, biscuits, savoury and sweet pies) among the parishioners and serve them. It often happened to me to hear them say proudly: "Try this cake/dish. I just received it from home [i.e., from Moldova]".

Another day, I was invited to lunch at a Moldovan friend's house, a manager in a Parisian company. The dish – a roasted rabbit – is presented as a delight, as the meat comes from Moldova. My friend's parents raise animals in Moldova for their own consumption and, from time to time – "in winter, because in summer it's too risky because of the heat" – they send their daughter "a bag", meaning a parcel with food and other items from Moldova. Her mother-in-law, also Moldovan, lives in Italy. So, my friend and her husband systematically receive parmesan, olives, and wine from Italy.

Indeed, these anecdotes are abundant. Moldovan immigrants in France, irrespective of their legal status, and their employment conditions—be they contract-less domestic workers, company executives, or students—all understand what it means to "send or receive a bag." In Romanian, "trimit / primesc geantă", literally means "I send / I receive a bag", that is, a parcel. This custom has become so commonplace that I didn't encounter any migrants during my field research who had never partaken in sending or receiving a parcel.

HISTORICAL PERSPECTIVE ON PARCEL EXCHANGES

Historically, the practice of "sending and receiving a bag" within Moldovan migration took root between 2000 and 2005. In this period, nearly 20% of the population emigrated from the country. Throughout these years, many Moldovans reached countries within the European Union through illegal means, often resorting to human trafficking networks, as evidenced by Veronica's husband's case (Veronica, 36 years old, high school education, unemployed / housekeeper) who spent 2,000 euros to reach his destination in 2005, navigating through German forests and hiding in large trucks. Quantitative data on this unauthorized emigration are absent. Nevertheless, in an informational report for the World Bank, Moldovan statisticians surmised that around one-third of Moldovan emigrants had illicitly traversed the border in 2010 (CIVIS, 2010, p.15). Considering that numerous Moldovans already possessed Romanian passports in 2010, it can be conjectured that the fraction of those who illicitly crossed the European Union border prior to 2007—when Romania introduced provisions for the naturalization of Moldovans—was likely more substantial.

[1] Fictitious first name. In order to respect the anonymity of my interviewees, I have changed their first names. However, I have chosen first names that respect the gender of the person (for example, a female name if the interviewee is a woman). In parentheses, after the first name, the following is indicated in the order announced: the person's age at the time of the interview, i.e., in 2017; the level of education; the profession practiced in Moldova / the job held in France.

Upon arrival, these individuals became undocumented immigrants, lacking the legal right to reside in the host country and work in the formal labour market. Being "undocumented" significantly restricted their rights, including the ability to open a bank account. Concurrently, access to certain postal services and lawful money transfer networks often demanded identity documents that the migrants couldn't provide. Lastly, the exorbitant transfer fees forced migrants to explore alternative ways to "send bags" back to their home country. Regarding the transaction fees levied by Western Union, for instance, during the 2000s, one can refer to an article published in the New York Times on November 22, 2007. Specifically in France, for certain destinations, these charges surpassed 10% of the total remitted amount.

In this context, informal networks for the transport of money and goods were established, linking migrants with Moldova. This pathway for material circulation has evolved into a truly international circulatory space, that has its own operational logic and moral code. Minibuses and coaches operate on a weekly basis, shuttling between Moldova and France continuously. Their primary function is to deliver parcels dispatched by families of Moldovan migrants and, in , to collect the parcels and monetary remittances that these migrants transmit to their families in their home country.

The scale of this material and symbolic exchange system is substantial, as evidenced by the sheer number of parcels sent and received. Luecke and Stoehr (2012, p.7) estimate that, in 2012, a Moldovan migrant's monetary transfers to Moldova averaged 27,000 MDL (about 1740 euros). This figure was complemented by more than 30,000 MDL (over 1,935 euros) in non-monetary transfers (i.e., parcels). These numbers underscore the significance of the parcel transfer phenomenon (at least from migrants to their country of origin). However, these statistics do not address the parcel circulation in the opposite direction—those sent from families remaining in Moldova to the migrants. As the testimonials obtained from my fieldwork suggest, the number and monetary value of these parcels would also be substantial, correlating with the quantity and monetary worth of parcels sent by the migrants. The empirical information gathered from my field study predom sinantly comprises qualitative data, rendering it inappropriate for confirming the stated hypothesis within this context. A comprehensive quantitative investigation would increase precision in validating the hypothesis.

MAIN RESULTS

A BRIDGE LINKING MIGRANTS AND THEIR RELATIVES FROM THEIR HOME COUNTRY

The parcel exchange has therefore become a universal practice, and metaphorically it resembles a *bridge*—a notion that emerges from the analysis of the practice of material circulation in Moldovan migration—that links continuously the emigrants with their close relatives back in Moldova. The metaphorical bridge serves as a vital connection between emigrants and their close relatives in Moldova. It symbolizes the continuous flow of objects, ideas, and emotions in both directions, akin to vehicles transporting tangible and intangible value. Parcels act as tangible expressions of love, care, and support, bridging the geographical distance and fostering a sense of connection and belonging.

The bridge operates as a multifaceted system of exchange. On the material level, it facilitates the transport of various goods and products that hold personal and cultural significance. For example, migrants may send essential items such as food, clothing, or household supplies that are difficult to obtain or of better quality in France. Additionally, they may include sentimental items or gifts that serve as reminders of home and shared experiences. The collection points – which are also present in the Parisian and Moldovan geographical spaces – serve to maintain group boundaries among these Moldovan migrants. In Ile-de-France, several collection points have been identified near the *Château de Vincennes*, at the *Porte de Montreuil*, at the *Place de la Nation*, at the *Place Trocadéro*, as well as in certain localities in the *Val-de-Marne* department, notably in *Villeneuve-Saint-Georges* and *Valenton*, where a significant number of Moldovans live.

THE TWO PILLARS: THE COMMERCIAL LOGIC AND RECIPROCITY

The circulatory space of material exchange within Moldovan migration operates on the foundation of two distinct pillars: ***commercial logic*** and the l***ogic of reciprocity***. These pillars shape the dynamics and functioning of the bridge connecting migrants to their country of origin.

Commercial logic is driven by principles of economic exchange and mirrors the practices of market systems. Within this logic, goods and parcels are exchanged based on their economic value, availability, and demand. Transporters are those who engage in exchanges on a commercial basis. They are fixing

a price per transferred kilogram and are selling Moldovan products—like chocolates, sunflower seeds, or pickled fish—in clandestine shops improvised on the back side of their buses. This commercial aspect of the bridge emphasizes an important part of the economic significance of material circulation on the "bridge".

However, alongside the commercial logic, the bridge also operates on the principle of reciprocity. I adopt Polanyi's conception of reciprocity. According to Polanyi (2011), the principal forms of integration—institutionalized patterns of interdependencies among the movements of goods, services, and people (Polanyi 2011, p.77) - encompass reciprocity, redistribution, and exchange. Reciprocity is a variant of economic integration undergirded by a symmetric structure, redistribution is underscored by a centralized structure, and exchange is dictated by a market-based structure. As per Polanyi's assertion, the most genuine system of reciprocity is the 'kula', as described by Bronislaw Malinowski (1922, p. 80). Reciprocity entails mutual exchange and the fulfilment of obligations between migrants and their families. It goes beyond economic considerations and encompasses the exchange of emotions, signs of solidarity, and acts of mutual assistance. Through reciprocity, the bridge becomes a venue for the exchange of intra-community services, where migrants support their families in Moldova while receiving emotional support in return. This reciprocal dimension strengthens collective identity and fosters a sense of community among migrants and their families.

The bridge's internal organizational logic and communication means contribute to its flexibility and adaptability. The actors involved, such as transporters and migrants, navigate the ever-changing context and circumvent formal rules and regulations that may hinder the flow of parcels. They maintain a delicate balance between competition, driven by market dynamics, and solidarity, which safeguards against external threats and challenges. A transporter who agreed to speak with me—transporters typically regard the researcher as a potential "external threat" capable of infringing upon their domain—mentioned that every transporter is aware that "they are all in the same boat and that they can all sink together [in case of a collision with national authorities]" (Sergiu, 48 years old, transporter/driver). Therefore, they send messages to each other, they signal to communicate and indicate the presence or absence of a "threat", which can arise as much from the national authorities of the countries through which the parcels transit, as from the organizations practicing thuggery or racketeering (incidents of this nature were common during the 1990s, but they have become increasingly rare in recent times, nevertheless, still mentioned in the discourse of my interviewees). Transporters, recognizing their shared vulnerabilities, establish communication networks to exchange information and signal potential risks that may arise from national authorities or criminal organizations.

Interestingly, Moldovans have ironically referred to this fluid and mutable space as the "Post Office of Moldova." This term encapsulates the transformative nature of the bridge, which has evolved into an international platform for material circulation. Through the exchange of goods and money, the bridge upholds economic morals and strengthens the ties between migrants and non-migrants in Moldova. It serves as a custodian of economic relationships, fostering interconnectedness and sustaining the flow of resources in the two directions.

OPERATIONAL PRINCIPLES, ECONOMIC IMPLICATIONS, AND SOCIAL IMPORTANCE OF TANGIBLE EXCHANGE BETWEEN MIGRANTS AND THEIR COUNTRY OF ORIGIN

The practice of sending and receiving parcels among Moldovan immigrants residing in France (and elsewhere) has become a structural component in their lives and those of their immediate kin in Moldova. The significance of these practices is measured less by the financial value of the parcels and more by their *social and emotional worth*, as suggested by the field data. While it is true that an economic (and to a certain extent, commercial) rationale partially undergirds the circulation of parcels—this observation is particularly applicable to nuclear families, within which a rudimentary incarnation of the resource redistribution principle can be discerned (Rosca 2018, p. 382) —, the predominant driving force behind this phenomenon emanates from a culture of *reciprocity*. This culture seems to be gaining ubiquity within Moldovan society and its migrants, and it prescribes the norms of interindividual interactions.

Therefore, individual behaviours and governing principles transcend the utilitarian framework, challenging the mainstream microeconomic theory that assumes individuals always act to maximize their utility. This phenomenon, therefore, invites comparisons with social exchange theory, which emphasizes the importance of reciprocal exchange in maintaining social relationships. This study may also contribute to broader debates about the social implications of economic activities and the economic dimensions of social relations.

We [the interviewee and her husband] send both money and parcels, but more often money. We help them [their parents]. We also help my brother. He is a student in Romania and my parents do not have the means [i.e., they don't have money] to assist him. We give them what we can. Sometimes 50 euros, sometimes 100 euros. Sometimes less, sometimes more. In fact, in a short while, my husband must go to the bus to send some money and a few basic goods. At the same time, he must collect a parcel that my mother sent us. [...] Of course, I don't ask her for anything. They, too, never ask for anything. But I prepare everything—a bag, a bit of money—without telling them a word, and once I hand it over to the driver, I call them to tell them to go pick it all up. My mother says, 'You shouldn't have! Why did you bother? We are managing here.' I know it's not true, that when she goes to the market to buy food, she can't even afford a piece of cheese. [...] What does she send me? Fruits, vegetables, wine. The other day, I burst into tears, so moved when she told me she had put some stems of spring onions in the parcel. [She displays a sad smile.] I always tell her not to send us anything, but she insists on doing it at all costs. She sends what she has, but always makes sure to send something. For Christmas, she prepared a parcel for us with pork meat, sauerkraut, and buckwheat." (Veronica, 36 years old, secondary school education, unemployed / domestic worker).

This extract from my dialogue with Veronica serves as an emblematic illustration of the views expressed by my interviewees. From a sociological perspective, it suggests that the exchange of parcels encapsulates the inherent logic governing social interactions within both the nuclear and extended Moldovan family structure. By extension, this legitimizes the postulation that such exchanges also reflect the inherent logic pervading the two distinct societal groups in Moldova: migrants and non-migrants.

The compulsive practice of reciprocating gestures underscores the importance of at least two principles integral to the social dynamic. Firstly, within familial relationships, parents inadvertently perpetuate their financial responsibilities towards their children into adulthood. A similar underlying logic, albeit in a nuanced manner, is also observed in relationships within a sibling group, wherein a portion of the parental responsibilities can be delegated to the eldest sibling. Veronica's case serves as a compelling illustration of this phenomenon, and numerous comparable instances can be found. This transference of the parental role onto the eldest sibling is particularly heightened in families where one or both parents have passed away. Secondly, they uphold a principle of reciprocity even in their relationships with their offspring. Consequently, they deviate from the first principle as they no longer fulfil needs based on *civic duty or legal obligations* but respond out of *a socially imposed obligation to reciprocate*, offering "at least something they possess." This refers to a part of themselves, their sympathy, and recognition, given in return. The same mindset and thus the same signs of acknowledgement can be detected in extra-familial social interactions. Here we recognize the principle of the Maussian gift (Mauss, 2007). The three types of obligations—to give, to receive, to reciprocate—that characterize the gift, facilitate the social relations of Moldovans.

An analysis of these exchanges offers a limited but insightful glimpse into some of the defining traits of social and economic organization, as well as consumption habits, prevalent in both the migrant community and the original society. The parcels serve as vessels transporting goods that symbolize the *exchange of lifestyles, production, and consumption patterns* amongst the participants. They also carry memories (of a homemade product, of fruit harvested from one's childhood garden - "treasures imbued with traces of Moldovan sun, rain, earth; a memento of those who hold us in their thoughts," as quoted by Sandu, a 39-year-old corporate executive with a Master's degree in France), or *markers of social differentiation through the consumption of goods "from abroad"* in Moldova. While these two aspects may seem contradictory, they are not mutually exclusive.

"They send us everything [i.e., food] that can be found in a household in the countryside, even meat when it's cold enough outside. Otherwise, we receive cheese, vegetables, fruits, homemade preserves, honey, and bacon. They send them to us for the "home flavor". Everything tastes better there [in Moldova]. And we know how these products were made or grown. Sometimes, we receive homemade wine. [...] For us, parcels are not an economic necessity. On the contrary, it's a hassle [he laughs], because we have to go and pick them up at the other end of Paris, we have to carry that heavy bag on the metro, and we also pay for transportation. Bref! But it is important for our parents and for us." Sandu (39 years old, Master's degree, student/ company executive)

Based on Sandu's interview, it seems that there are several motivations behind these exchanges. First, a significant part of the motivation seems to come from a desire to maintain a cultural connection with Moldova. The products that are being sent from "home" are not just food. They are reminders of home, symbols of a way of life that is deeply connected to traditional methods of food production. Sandu specifically mentions the

superior taste of these products and the knowledge of how they were made or grown, which adds to their value. Another crucial motivation is the maintenance of family bonds. Despite acknowledging that the parcels are a hassle to collect and transport, Sandu mentions that the parcels are important for his parents and for him. This statement indicates that the exchange of goods is a way of upholding familial responsibilities and connections. Also, the continued use and consumption of products from their home country help the family maintain their identity and connection to their Moldovan heritage while living in Paris.

The parcels, acting as conduits that traverse the "bridge" and connect migrants to non-migrants, the host country to the country of origin, bear social indicators in both directions. They embody emotions such as love, altruism, individual and collective memory, as well as the logic of giving and reciprocity. These elements serve as crucial pillars sustaining the multifaceted mechanism of material circulation. It is important to note that this mechanism operates through several equally significant points of support. The specific logic governing this circulation varies depending on the actors involved in these exchanges. For transporters, a commercial logic prevails within the "guarded borders" framework upheld by cooperative behaviors. On the other hand, migrants and non-migrants are driven by multiple economic and social logics, encompassing aspects of redistribution, reciprocity, and altruism.

CONCLUSIONS

The practice of sending and receiving parcels among Moldovan immigrants residing in France has become a structural component in their lives, reflecting global trends of migrant communities maintaining strong ties with their countries of origin. This practice occurs in a broader context marked by economic instability in Moldova and increasing globalization, which facilitates international migration.

The findings from this study, grounded in ethnographic data gathered from Moldovan migrants in Paris during a 2017 survey, demonstrate that the exchange of parcels between migrants and their family members in Moldova has reshaped the material flow associated with Moldovan migration into a supranational social structure. This structure, metaphorically likened to a bridge, has its unique operational principles—both commercial and reciprocal—and involves a variety of participants (transporters, migrants, non-migrants) in equal measure.

In an attempt to decode the various principles that engage these participants within the material flow related to migration, I have highlighted the tangible and symbolic procedures inherent in the parcel transfer mechanism. This mechanism serves as a conduit that bridges the gap between communities of individuals living in different societies (migrants in France and non-migrants in Moldova), transcending national boundaries.

With regard to the parcel transfer mechanism, it operates on its own unique principles, blending both commercial and reciprocal elements, which contributes to its flexibility and proliferation. Beyond these features, it acts as a unifying factor for the migrant community, offering a platform for mutual assistance, intra-community service exchanges, and the reinforcement of the collective identity of migrants. It also serves as the main avenue for economic and social interactions with the home country's community. The driving forces behind this material flow make it a two-way process, encompassing social aspects such as basic forms of wealth redistribution, reciprocity, and altruism.

Despite the insights provided by this research, it's important to acknowledge its limitations. The study focused exclusively on Moldovan migrants in France, and while the findings may have implications for other migrant groups, the specific cultural, economic, and social factors at play in this context mean that the results may not be universally applicable. Future research should, therefore, aim to explore similar practices among different migrant populations and in different host countries.

REFERENCES

Benarrosh-Orsoni, N. (2016). Phones, Small Talk and Disputes. Transnational Communications and Community Cohesion among Roma Migrants in the Outskirts of Paris. Revue européenne des migrations internationals, 32 (1), 147-163. https://doi.org/10.4000/remi.7698

Caracentev, S. (2020). The Gift of connectedness: Re-stitching the transnational relational web. Chapter III. In Parcel vans and the materiality of staying connected in Moldovan transnational families [Doctoral thesis]. London: University College London, 110-133. https://discovery.ucl.ac.uk/id/eprint/10094687/1/Final_thesis_SCaracentev.pdf

Caracentev, S. (2022). Migratia. In D. Roșca & L. Cotovanu. Republica Moldova: 30 de ani în 30 de cuvinte (pp. 294-309). Chișinău: Cartier

Central Intelligence Agency (CIA). (2018). The World Factbook. https://www.cia.gov/the-world-factbook/

Centru de analize şi investigaţii sociologice, politologice şi psihologice (CIVIS). (2010). Consolidarea legăturii dintre migraţie şi dezvoltare în Moldova. http://civis.md/Archive/CIVIS_IASCI_BM_Migratie%20si%20dezvoltare_prezentare.pdf

Cheianu-Andrei, D. (2013). Cartografierea diasporei moldoveneşti în Italia, Portugalia, Franţa şi Regatul Unit al Marii Britanii. https://brd.gov.md/sites/default/files/document/attachments/01_cartografierea_diasporei_moldovenesti_in_4_tari_ue_rom.pdf

Diminescu, D. (2008). The connected migrant: an epistemological manifesto. Social Science Information, 47(4), 565-579. https://doi.org/10.1177/0539018408096447

El Miri, M. (2011). Quand les migrants se choisissent: Qualification sociale et selection des postulants à la migration au Maroc. European Journal of Sociology, 52(2), 209-235. https://doi.org/10.1017/S0003975611000099

Gagauz, O. (2023). Recalcularea numărului populației Republicii Moldova, 2004-2014. Chişinău. https://doi.org/10.36004/nier.2023.978-9975-147-86-6

Institutul de politici publice (IPP). (2000). Barometrul opiniei publice, 2000. http://ipp.md/old/lib.php?l=ro&idc=156&year=2000

Luecke, M., Mahmoud, T.O., & Pinger, P. (2007). Patterns and Trends of Migration and Remittances in Moldova Chişinău: International Organization for Migration

Luecke, M., & Stoehr T. (2012). The effects of migration in Moldova and Georgia on children and elderly left behind. Europe Aid Project: DCI-MIGR/210/229-604, Country Report: Moldova

Malinowski, B. (1922). Les Argonautes du Pacifique occidental. Paris: Gallimard

Massey, D. S., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., & Taylor, J. E. (1993). Theories of International Migration: A Review and Appraisal. Population and Development Review, 19(3), 431-466. https://doi.org/10.2307/2938462

Mauss, M. (2007). Essai sur le don. Forme et raison de l'échange dans les sociétés archaïques. https://doi.org/10.4000/lectures.520

Pathirage, J., & Collyer, M. (2011). Capitalizing social networks: Sri Lankan migration to Italy. Ethnography, 12(3), 315-333. http://www.jstor.org/stable/24048141

Peraldi, M. (2016). Le «commerce migratoire» euroméditerranéen. Politique étrangère, 35-46. https://doi.org/10.3917/pe.164.0035

Polanyi, K. (2011). La Subsistance de l'Homme. La place de l'économie dans l'histoire et la société. Traduit de l'anglais et présenté par Bernard Chavance, Flammarion. ISBN 9782081229105.

Portes, A. (1999). La mondialisation par le bas. L'émergence des communautés transnationales. Actes de la recherche en sciences sociales, 129, pp. 15-25, https://www.persee.fr/doc/arss_0335-5322_1999_num_129_1_3300

Portes, A., & Böröcz, J. (1989). Contemporary Immigration: Theoretical Perspectives on its Determinants and Modes of Incorporation. International Migration Review, 23(3), 606-630. https://doi.org/10.1177/019791838902300311

Portes, A., & Guarzino, L. E. (1991). Tropical Capitalists: U.S.-Bound Immigration and Small Enterprise Development in the Dominican Republic. In Diaz-Briquets, S., Weintraub, S. (Eds.), Migration, remittances, and small business development: Mexico and caribbean basin countries (1st ed.). https://doi.org/10.4324/9780429046506

Potot, S. (2003). Circulation et réseaux de migrants roumains: Une contribution à l'étude des nouvelles mobilités en Europe [thesis]. Nice: Université de Nice-Sophia Antipolis. https://theses.hal.science/tel-00003480

Rosca, D. (2018). Importanța și modul de funcționare a solidarităților private în cadrul emigrației moldovenești. Anchetă în regiunea pariziană. In Диаспоры в современном мире: региональный контекст и потенциал для устойчивого развития страны происхождения = Diaspora în lumea modernă: contextul regional și potențialul pentru o dezvoltare durabilă a țărilor de origine = Diasporas in Modern World: Regional Context and Potential for Sustainable Development of the Country of Origin: conferința științifică internațională, 21 decembrie 2017, (pp. 375-388). Chișinău: International Organization for Migration. https://moldova.iom.int/sites/g/files/tmzbdl1626/files/documents/Diasporas%2520in%2520the%2520Modern%2520World_Regional%2520Context%2520and%2520Potential%2520for%2520Development%2520.pdf

Roşca, D. (2019). Le Grand Tournant de la société moldave: «Intellectuels» et capital social dans la transformation post-socialiste. Paris: Presses de l'Inalco. https://doi.org/10.4000/books.pressesinalco.19771

Sayad, A. (1999). La double absence. Des illusions de l'émigré aux souffrances de l'immigré. Paris: Seuil

Sayad, A. (2014). L'immigration ou les paradoxes de l'altérité. Tome 3: La fabrication des identités culturelles. Cours et travaux. Paris: Raisons d'agir. http://iris.ehess.fr/index.php?2470

Sayad, A. (1986). "Coûts" et "profits" de l'immigration. Actes de la recherche en sciences sociales, 61, 79-82. https://www.persee.fr/doc/arss_0335-5322_1986_num_61_1_2308

Schiller, N. G., Basch, L., & Blanc, C. S. (1995). From Immigrant to Transmigrant: Theorizing Transnational Migration. Anthropological Quarterly, 68(1), 48-63. https://eportfolios.macaulay.cuny.edu/lutton15/files/2015/02/Theorizing-Transnational-Migration.pdf

Stöhr, T. (2013). Intra-Family Migration Decisions and Elderly Left Behind. Working Papers. No. 1858. Germany: Kiel Institute for the World Economy https://brd.gov.md/sites/default/files/document/attachments/decizia_intrafamiliala_de_emigrare_si_virstncii_ramasi_singuri_analiza_rm_eng.pdf

Tabac, T. (2021). Migrația populației. In: Gagauz, O. (coord.), Populația Republicii Moldova la 30 de ani de independență: provocări principale și politici necesare (pp. 97-120). Chișinău: INCE, CCD. http://dspace.ince.md/xmlui/bitstream/handle/123456789/1459/Popula%c8%9bia_Republicii_Moldova_la_30_de_ani_de_independent.pdf?sequence=3&isAllowed=y

Tabac, T., & Gagauz, O. (2020). Migration from Moldova: Trajectories and Implications for the Country of Origin. In: Denisenko, M., Strozza, S., Light, M. (Eds.), Migration from the Newly Independent States. Societies and Political Orders in Transition (pp. 143-168). Cham: Springer. https://doi.org/10.1007/978-3-030-36075-7_7

Tarrius, A. (2002). La mondialisation par le bas. Les nouveaux nomades de l'économie souterraine. Paris: Balland.

Vaculovschi, D. (2023). Labor migration and the phenomenon of transnational families from the Republic of Moldova. Eastern European Journal for Regional Studies (EEJRS), 9(1), 153-162. ISSN 2537-6179. https://doi.org/10.53486/2537-6179.9-1.12

Weber, S. (2013). Espaces et passeurs de changement au Moyen-Orient: le transnational au-delà des impasses du nationalisme. EchoGéo, 25. https://doi.org/10.4000/echogeo.13566

Weiner, A. B. (1992). Inalienable Possessions. The Paradox of Keeping-While-Giving. E-Book. Berkeley: University of California Press. Retrieved from https://www.perlego.com/book/552439/inalienable-possessions-pdf

World Bank Open Data. (n.d.). World Bank Open Data. https://data.worldbank.org/country/moldova

World Bank. (2011). Moldova after the Global Crisis. Promoting Competitiveness and Shared Growth: Poverty Reduction and Economic Management Unit Europe and Central Asia Region. Report: No. 55195-MD. https://documents1.worldbank.org/curated/en/291951468054585656/pdf/551950ESW0p1090sclosed0Dec013020110.pdf

Zwager (de), N., & Sințov, R. (2014). Inovație în migrația circulară. Migrație și dezvoltare în Moldova: studiu de piață. Chișinău: Elan Poligraf. http://civis.md/Archive/IASCI-CIVIS%20Migratie%20si%20desvoltare%20in%20Moldova%20studiu%20de%20piata%202014.pdf

THE STRATEGIC DEVELOPMENT OF THE RENEWABLE ENERGY SECTOR IN MOLDOVA: MODELS FOR INVESTMENT MANAGEMENT

DOI: https://doi.org/10.36004/nier.es.2023.1-02
JEL classification: D78, D81, E65, G18, L52
UDC: 338.45:620.97(478)

Irina NASALCIUC,

PhD Student, National Institute for Economic Research, Academy of Economic Studies of Moldova

https://orcid.org/0009-0001-1601-6133
e-mail: nasalciuc.irina@gmail.com

Received 1 February 2023
Accepted for publication 13 June 2023

SUMMARY

The periodic paradigm shifts operating on the energy markets require higher innovative approaches to facilitate the management of energy portfolios and the design of mechanisms for an accelerated renewable energy integration. Thus, international organizations, policy makers and managerial boards are continuously seeking for policy amendments and adjustments that would enhance the investments in the renewable energy sector and stimulate the transition towards the smart energy grids' models.

The current study aims to review and apply some of the existing models for the management of renewable energy investments, using as a case study Moldova's economy structure and its statistical data. The study is based on systemic research methods, forecasting models and estimates to identify most productive management tactics, able to ensure the proper integration of smart energies into the energy network. The author presents a model for forecasting the demand of the renewable energy market in Moldova till 2025 and 2030 year with an emphasis on the electricity segment. It also points out opinions and estimates that reflect a different perspective on the effects of investments' management at the electricity segment level and proposes solutions that may help decision-makers in the development and integration of the country's renewable energy policy. The study offers the necessary evidence and grounded solutions for attracting and promoting investments in renewable energy projects, whereas the obtained methodology and results have a general relevance for other countries in the region with emerging economies.

Keywords: *renewable energy, investment management models, demand forecast*

Schimbările periodice de paradigmă operate pe pieţele energetice necesită abordări inovatoare pentru a facilita gestionarea portofoliilor energetice şi formarea mecanismelor pentru accelerarea integrării energiei regenerabile. Organizaţiile internaţionale, factorii de decizie şi investitorii urmăresc introducerea continua de amendamente şi ajustări a politicilor menite să sporească investiţiile în sectorul energiei regenerabile şi să faciliteze tranziţia către modelele reţelelor energetice inteligente.

Lucrarea îşi propune să revizuiască şi să aplice unele modelele existente pentru managementul investiţiilor în energie regenerabilă, folosind datele statistice şi structura economiei Moldovei ca studiu de caz. Studiul este bazat pe metode sistemice de cercetare, modele de previziune şi estimări pentru a identifica tactici productive de management, capabile să asigure integrarea corespunzătoare în reţeaua energetică a energiilor inteligente. Autorul prezintă un model de prognoză a cererii pieţei de energie regenerabilă din Moldova până în anii 2025 şi 2030, cu accent pe segmentul energiei electrice. Sunt prezentate estimări care reflectă o optică nouă asupra efectelor managementului investiţiilor în energia electrică, propuse câteva soluţii care ar putea ajuta factorii de decizie în elaborarea şi integrarea politicii de energie regenerabilă a ţării. Studiul oferă mai multe raţionamente şi soluţii argumentate care ar contribui la atragerea şi promovarea investiţiilor în energie regenerabilă, iar metodologia şi rezultatele obţinute au o relevanţă generală pentru alte ţări din regiune cu economii emergente.

Cuvinte cheie: *energie regenerabilă, modele de management a investițiilor, prognoza cererii*

Периодические изменения парадигмы, действующие на энергетических рынках, требуют инновационных подходов, чтобы способствовать управлению энергетическими портфелями, а так же формированию механизмов оценки интеграции возобновляемых источников энергии. Таким образом, международные организации, институты власти и инвесторы ожидают постоянного внесения поправок и корректировок в политику, направленных на увеличение инвестиций в сектор возобновляемых источников энергии и облегчение перехода к моделям интеллектуальных энергосистем.

Целью статьи является обзор и применение некоторых существующих моделей значимых для управления инвестициями в возобновляемые источники энергии на основе использования статистических данных и структуры экономики Молдовы в качестве примера. Исследование основано на применении системных методов, прогнозных моделей и оценок для определения продуктивной тактики управления, способной обеспечить правильную интеграцию в энергетическую сеть возобновляемых энергий. Автор предлагает модель по прогнозированию спроса рынка возобновляемых источников энергии в Молдове до 2025 и 2030 годов, акцентируя внимание на сектор электроэнергии, представляет концепции и оценки, отражающие различный взгляд на эффект, получаемый от вложения инвестиций в электроэнергетику, а также предлагает некоторые решения, которые могут помочь лицам, принимающим решения в разработке и интеграции политики страны в области возобновляемых источников энергии. В исследовании предложены аргументированные обоснования и решения, которые будут способствовать привлечению и продвижению инвестиций в возобновляемые источники энергии, а методология исследования и полученные результаты имеют актуальность и могут быть полезны для других стран региона с развивающейся экономикой.

Ключевые слова: *возобновляемая энергия, модели управления инвестициями, прогноз спроса*

INTRODUCTION

Moldova is a European landlocked, post-Soviet country with an emerging upper middle-income economy still undergoing a transition phase in terms of economic structures and operating regimes. It is important to note that Moldova has minor reserves of coal, oil, and natural gas, as well as a moderate hydropower potential. As a result, the country heavily relies on energy imports, primarily from Russia, Ukraine, and Romania. This dependence poses continuous security challenges in energy supply, leading to an unreliable and sometimes costly access to energy in various forms and technologies.

Currently, Moldova is making significant efforts to establish competitive renewable energy market niches capable of penetrating the energy market and competing with the conventional technologies. However, the country faces major issues with its energy infrastructure, including outdated installations and low-quality thermal insulation in both residential and public buildings. Consequently, Moldova's economy exhibits a high degree of energy intensity, surpassing the average energy intensity values of European countries.

The technical deficiencies, coupled with legislative gaps and the lack of stable governmental frameworks for renewable energy sources (RES) deployment, create an environment of investment reluctance. Investors perceive high levels of risk associated with the established business regulatory frameworks in which they would operate while entering Moldova's renewable energy market.

Overall, Moldova's energy landscape requires substantial improvements in infrastructure, legislation, and governmental support to enhance energy security, reduce energy intensity, and attract sustainable investments in renewable energy technologies (RET).

Over the last ten years, Moldova registered an increase in both primary and final energy consumption of about 16,4% and 21,5% respectively. The data of the National Bureau of Statistics (NBS) show that Moldova's final energy demand increased by an average of 1-2% per year, reaching the level of 2,924 thousand toe in 2021. After 2019 year, the gross domestic consumption decreased due to the stagnant economy affected by the COVID-19 pandemic, registering a level of only 2,670 thousand toe in 2020. However, in 2021, thanks to the economic recovery processes after the lift of all restrictions on businesses, the final energy consumption recovered and recorded the highest level since the 2010 year. Currently, only 20% (or 0,98 TWh) of the electricity that Moldova needs (3,85 TWh)) is produced and generated in the country (excluding the plan on the left side of Nistru River, at Cuciurgan), mainly by the combined heating and power plants, and only 13,4% of it comes from RES sources.

In the context of the energy crisis that began in 2021-2022, Moldova's energy vulnerability has worsened, exposing chronic problems within the system. As a result, given the recent progress in developing electric power frameworks and the country's obtained status of an EU accession candidate. Moldova is committed to transposing European targets aiming to achieve a 34% share of renewable generation in final electricity consumption by 2025. This target would require a capacity of approximately 450 MW, based on electricity consumption levels from the year 2020, and would primarily rely on photovoltaic, wind, hydrological, and cogeneration-based projects.

On the same note, it is essential to mention that at the beginning of the year 2023, the main national energy operator and distributor - Moldelectrica, reported a total of 62 requests for connection to the electricity network submitted between 2016 and the end of 2022. These requests aim to connect future power plants for electricity production based on renewable energy sources (RES) technologies such as solar, wind, and biogas, potentially leading to a total capacity of 1,22 GW. Most of these power plants are expected to become operational in the near future, which requires a strengthened electric power system to accommodate these new sources of generation.

Consequently, a series of physical replanning and enhancements, along with amendments to the regulations and norms of the political and legal frameworks, are critically needed. These measures will establish the activities of market actors and ensure they are prepared for the active absorption of RES sources in the energy system.

Gropa's research studies (2018) demonstrated that the local power system would be capable of absorbing approximately 1 GW of renewable sources, considering current infrastructure conditions. However, an increased absorption of solar and wind generation would pose a significant challenge since Moldova relies entirely on Ukraine for grid balancing.

To address this issue, the government decided to impose ceilings on the development of RES capacities, aiming to avoid network management problems and the high costs associated with balancing RES generation. The Government of Moldova is actively interested in fostering a business environment that facilitates the development of projects based on RETs.

LITERATURE REVIEW

Energy transition processes depend on market saturation levels at certain stages and long-term quantitative energy demand forecasts. Adapting the modeling of RES energy portfolios to future market needs is based on long- and medium-term energy demand forecasts. The investment management models are essential in the planning, testing, streamlining, and development of energy markets at local, regional and national levels.

The development of the energy demand forecasting models started around 1985 year, it spiked after 2005 and continues till nowadays. Initially, there was a stringent need to assess the energy planning models to determine the long-term and medium-term evolution of energy markets, and later, when the RETs penetrated the energy markets, the need for a more rigid and rigorous management of energy supply and demand fluctuations arose. Based on the realities of the modern energy markets, there was also the need to develop energy forecasting models that would allow the identification of more efficient investment management models that would align to word's current pace of innovation, conducted operations on the market and globalization of the economies. Also, given the constant increase in worldwide energy consumption, it has become imperative to entail targeted energy consumption efficiency models both at the industrial level and at the level of individual households. Ultimately, the biggest concern of researchers and academia in the development of energy production models is the minimal environmental impact and/or carbon capture, so that the climate change process is slowed down (Nasalciuc, 2016a), in accordance with the sustainable development principles (Greene D. L., 2009), and with the World Energy Council's "Energy Trilemma Index" (2002), which considers: 1) "a nation's capacity to meet current and future energy demand reliably, withstand and bounce back swiftly from system shocks with minimal disruption to supplies, 2) a country's ability to provide universal access to affordable, fairly priced and abundant energy for domestic and commercial use, and 3) a country's energy system transition towards mitigating and avoiding potential environmental harm and climate change impacts".

The specialized literature is generous in terms of case-studies researching various RES investments implemented in different regions of the world (Schwerhoff et. al., 2017; Schinko & Komendantova 2016; Abdullahi et al., 2017; Movilla et al., 2013), or for different RETs (Shaktawat & Vadhera, 2021; Schiera et al., 2019; Qiu et al., 2020). There are also a series of research papers that assess the major barriers for large-scale RES investments and the associated risk management practices (Egli, 2020; Kitzing, 2014; Liu & Zeng, 2017; Nasalciuc, 2016b), that can serve for planning of policy adjustments. At the same time, there is a limited number of studies that assess and apply different models for investment management of RES at the macro level (Lee et al., 2017), investment planning (Taghizadeh & Yoshino, 2020; Cohen et al., 2021; Cohen J. J. et al., 2021) and planning from the environmental point of view (Dato, 2018). These gaps can be filled by models selected and adapted to the energy sector, considering the expected effects, the profile/design of the energy market, the portfolio of managed sources, the structure of the economy and the socio-economic situation.

In carrying out a deep study of RES investments' management, the author reviewed the literature, especially the one applicable and considered by the European market, (Kleinpeter, 1995; Prasad et al., 2014) that determines and identifies the existing models used in the management process of energy sector investments that can serve for the design of the necessary resources, the substantiation of investments (at the same time being an argument for the definition of policies aimed at promoting the energy transition), and propose the following classification of energy management models:

- *Energy demand analysis and forecasting models*
- *Energy supply planning models*
- *Energy optimization models (integrated energy supply and demand models)*
- *Emission reduction models*

In this study we will focus primarily on the demand analysis and forecasting models to provide qualitative findings to inform the energy market policy design and identification of RES market development targets. Analysis and systematization of existing literature (Deeble & Probert, 1986; Sterman,1988; Sterman & Davidsen, 1988; Labys,1990; Zmeureanu, 1992; Badri, 1992; Michalik, et al., 1997; Debnath & Mourshed, 2018) provide a certified methodological basis for identifying energy markets' development stages, analysing the energy demand and for designing long- and medium-term management directions.

Studies (Ang & Zhang, 2000; Ang, 2004) show that energy demand can be researched using the decomposition method by identifying changes in the economy based on the following three factors:

- *changes in the technological efficiency of energy use at the sector level;*
- *changes in the structure of economic activities; or*
- *changes at the level of economic activities.*

The economic activities, which are reflected in changes of economic production from one period to another (e.g., increases in total production of economies), as well as changes in the structure of economic activities observed at the sectoral level (e.g., transitioning to service-based economies like in Great Britain), and the efficiency of energy consumption in different industries, all drive fluctuations in energy demand levels over time. The results of the referenced studies (Ang & Zhang, 2000; Ang, 2004) demonstrate that the structure of the economy plays a significant role in determining energy intensity values, which in turn directly affects energy demand levels.

DATA SOURCES AND METHODS

Energy demand forecasting involves the prediction of the future energy demand based on the observation of historical demand trends that consider the demand growth rate, the demand elasticity, and the energy intensity.

- **Demand growth rate** – indicator that measures the growth rate of energy demand either from one year to another or from one period to another. Therefore:

$$a = (E_{t+1} - E_t)/E_t \quad (1)$$

where: a – annual increase in demand; E_{t+1} – energy consumption in year $t + 1$ and E_t – energy demand in year t

- **Elasticity of demand** – indicator that measures the variation of demand (in %) under conditions where the determining variable changes by 1%. In economic analysis, the variables of elasticity most often used are - economic activity (GDP), price and income. The demand elasticity indicator can be measured by using the correlation of the annual growth rate of energy consumption and the determining variable or through the lens of econometric correlations related to time series data.

$$e_t = \frac{\Delta^{EC_t}/_{EC_t}}{\Delta^{I_t}/_{I_t}} \quad (2)$$

where: t – a given period of time; EC – energy consumption; I – the determining variable of energy consumption such as GDP, added value, price, income, etc. and Δ – variable change.

Usually, GDP growth shows a positive correlation with energy demand growth, respectively in the situation when the GDP growth is greater than 1%, the demand is elastic in relation to the gross domestic product and in the situation when the elasticity is $0<e_{GDP}<1$, the demand is considered inelastic. In most cases, developed countries express inelastic demand vis-à-vis gross domestic product and developing countries tend to consume larger amounts of energy to ensure the growth of economies that invest in industrial activities and provide higher levels of consumer demand from the residential sector.

On the other hand, demand elasticity is inversely proportional to each percentage increase in the energy price, implying that higher energy prices result in decreased energy demand, at least for the short term. Consumers may be unable to adjust their budgets in response to energy price hikes, leading to reduced energy consumption. However, in the long term, elasticity tends to adjust as consumer budgets adapt to the higher prices. Moreover, the price elasticity of demand for energy varies depending on the type of fuel used in the energy production process.

Energy Intensity (EI) – measures the amount of energy required (aggregated or disaggregated) per unit of economic production.

$$EI_t = \frac{\sum_{i=1}^{n} E_{it}}{I_t} \quad (3)$$

where: E_{it} = energy consumption for each type of energy in year t, I_t = the determining variable of energy consumption – GDP volume per national economic sector.

In the comparative analysis of the levels of energy intensities at the macroeconomic level as well as for the non-productive sectors - transport and residential, it is recommended to use the determinant variable - GDP, and in the case of productive sectors such as commercial, industrial and agricultural, the use of added value as the determinant variable. However, comparing the energy intensity at the level of different countries is a difficult task since both the GDP and the added value are aggregated and structured variables at the level of each country, presenting particularities of measurement. For example, in the measurement of GDP there may be measurement gaps when the economy operates under the conditions of informal economies (most often found in developing countries) or in the case of converting GDP at the same exchange rate - in the most frequent cases the conversion to USD is chosen, which does not always express the real dynamics in the economic sector.

The study uses the regression method for forecasting the medium-term (for a period of five years or less) and long-term time frames (for a period of 10 years or more) for modelling the renewable energy demand forecast. Also, based on the model described in the papers of Ang & Zhang (2000) and Ang (2004) for the changes in total energy demand, we have:

$$\mathbf{E = Q \sum \left(\frac{E_i}{Q_i} \frac{Q_i}{Q}\right) = Q \sum EI_i S_i} \qquad \mathbf{(4)}$$

where: EI_i – the energy intensity at the level of sector *i* (e.g. the rate of energy consumption relative to the economic production of the sector); S_i – the structure of sector *i* (e.g. the contribution of the production of sector i to the total production of the economy); Q – the total productivity of the economy; Q_i – the productivity of sector *i*; E – total energy consumption; E_i – energy consumption of sector *i*.

When attempting to identify the changes impact of one of the three factors listed above over energy consumption, we will have:

- *for changes in the technological efficiency of energy use at the sector level:* $I = (Q^0) \sum (EI_i^t - EI_i^0) S_i^0$
- *for changes in the structure of economic activities:* $S = (Q^0) \sum (S_i^t - S_i^0) EI_i^0$
- *for changes at the level of economic activities:* $Q = (Q^t - Q^0) \sum (EI_i^0 S_i^0)$

All provided models may be applied to Moldova's case study and the results may inform the decision makers on the necessary measures that have to be adopted for a rapid integration of RES sources into the national portfolio of energy.

Observing historical energy demand trends in Moldova serves as the primary foundation for evaluating future demand growth levels, the degree of demand elasticity, and the energy intensity rate. These indicators play a crucial role in medium and long-term market evolution forecasting exercises and in planning national energy portfolios that balance the integration of RES and conventional energy generations. The application of this approach in the long-term energy market planning ensures that the energy system develops and adapts effectively to market transitions.

In order to identify the average annual growth rate of final energy consumption as well as to identify the levels of final energy/electricity consumption towards 2025 and 2030 year, the following relationships were used:

$$\boldsymbol{r = \left(\frac{v_2}{v_1}\right)^{1/n} - 1 \text{ and } v_2 = v_1(1+r)^n} \qquad \mathbf{(5)}$$

where: v_1 – total final energy consumption in T_1, v_2 – total final energy consumption in T_2, n – number of years.

Also, to determine the elasticity of the energy demand of Moldova, according to the relation (3), in relation to the selected elasticity variables (in our case - economic activity - GDP) according, we will identify the type of economic policy carried out by the decision-makers with regards to new investments and the type of prioritized economic activities.

$$\mathbf{E_{PIB} = \frac{\Delta^{EC_t}/_{EC_t}}{\Delta^{I_t}/_{I_t}}} \qquad \mathbf{(6)}$$

MAIN RESULTS

The analysis of the historical energy demand trends and the assessment of its growth forecast for 2025 and 2030, considering the data published by Moldova's National Bureau of Statistics (NBS) in the period of 2010-2021 years and the data of the World Bank (for the GDP indicator), is structured as follows (Table 1.):

Table 1.

Forecast of energy demand growth trends in Moldova for 2025 and 2030 year

Indicators	2011	2013	2015	2017	2019	2021	Foreseen levels	2025	2030
GDP (M USD)	8 414	9 497	7 745	9 670	11 970	13 680		16 812	21 755
Total final consumption (thousands toe)	2 406	2 390	2 455	2 719	2,739	2,924		3 164	3 491
Final electricity consumption (MWh)	3 384	3 559	3 687	3 687	3 803	4 129		4 472	4 942
Annual growth rate of final energy consumption	-	-0,003	0,014	0,052	0,004	0,033			
Annual growth rate of final electricity consumption	-	0,025	0,018	0	0,016	0,042			
Annual GDP growth rate	-	0,062	-0,097	0,117	0,113	0,069			
Average annual growth rate of final energy consumption (r1)									0,01989249
Average rate of annual increase in electricity consumption (r2)									0,02016983
Average GDP growth rate									0,52897438

Source: calculated based on NBS and the World Bank (WB) data

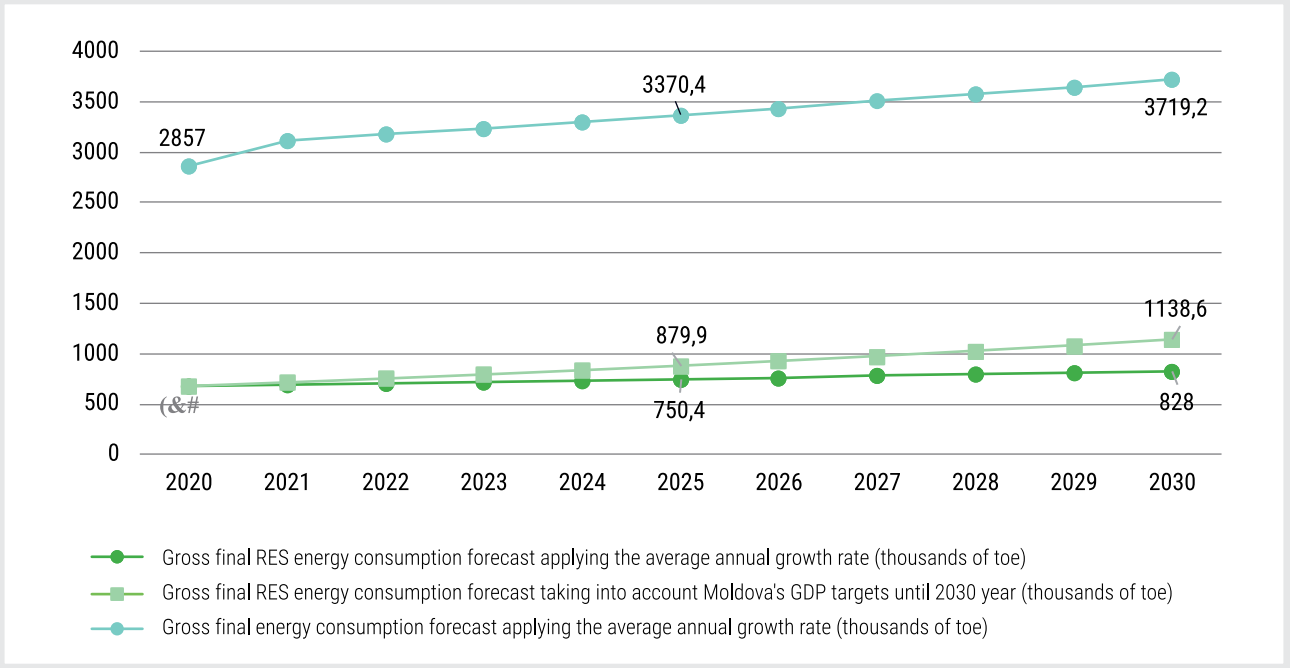
When considering the historical final energy consumption trends, we can observe the continuity of energy and electricity consumption growth by 10,74% towards 2025 year and by 22,19% towards 2030 year. The trend of 1,99% annual growth of energy demand is necessary when considering Moldova's current demographic situation as well as the current economic development rates. Thus, for the pessimistic scenario we will consider the registered shares of renewable energy (24,3%) in gross final energy consumption (2 857 thousand toe) of the 2020 year, which is considered as baseline data, and will apply the average annual growth rate of the identified final energy consumption. To continue evaluating the growth rate of Moldova's energy demand in the medium (toward 2025 year) and long term (toward 2030 year), it is necessary to consider the following strategic country targets:

- *The 3,5% target of annual GDP growth till 2030 year according to the National Development Strategy (NDS) of Moldova until 2030 year.*
- *The inflow of foreign direct investments as a share of GDP, which sets a target of 3,5% annually until 2026 year and of 4% until 2030 year (NDS, 2020).*
- *The target of 410 MW of new electrical RES capacity installed by 2025 year, mostly from wind and photovoltaic sources (amendment of Government Decision (HG 401/2021).*

Also, when applying the relation (6), we obtain EPIB =0,177/ 0,385 = 0,46 and respectively a relatively inelastic demand vis-à-vis the country's GDP (0 <EPIB< 1). Thus, a 3,5% annual increase in GDP predicted in the SND until 2030 will be directly proportionally reflected in the levels of gross energy consumption, including those of RES energy (Figure 1.):

Figure 1.

Forecast of RES gross final energy consumption evolution applying the average annual growth rate of final energy consumption and considering the forecast levels of GDP until 2030 year (in thousands toe)



Source: calculated based on NBS and the World Bank (WB) data

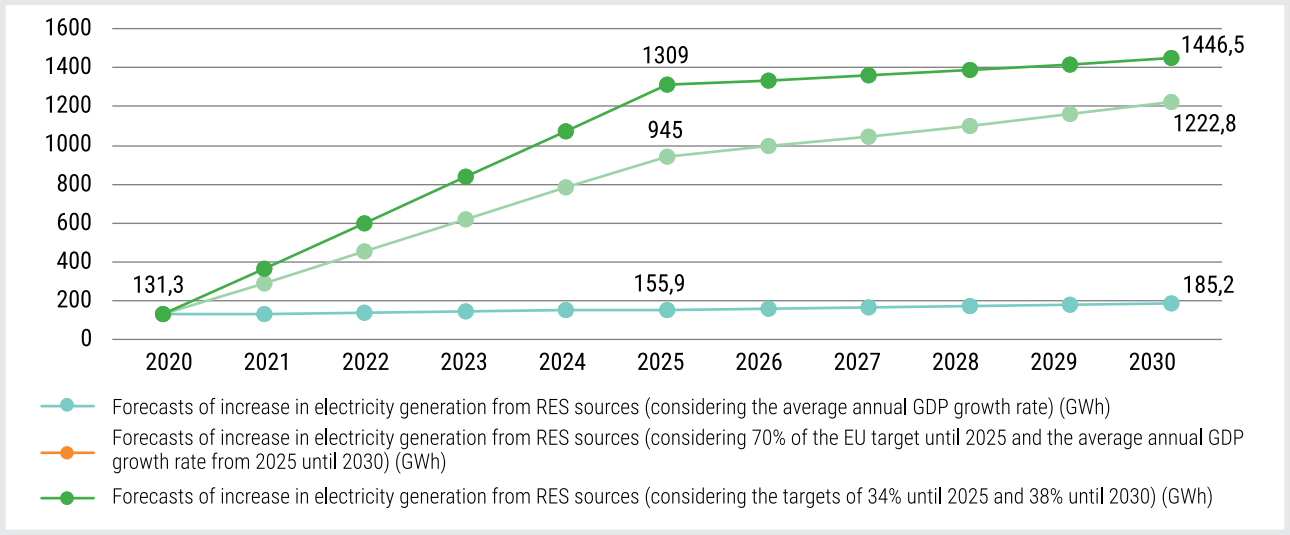
The results show that under the pessimistic RES energy demand forecast model, the growth trend of final gross consumption of RES energy towards 2030 year shows an increase of 21,77%. An average scenario for forecasting future RES energy demands would consider the predicted rates of economic development and the future needs of the country, while the optimistic scenario would consider the future targets set for RES shares in gross final energy consumption until 2025/2030 years.

Even though Moldova secures 24,3% of its total energy supply from RES sources, these indicators are determined by the solid biofuels widely used in the residential sector, especially in the rural areas of the country. However, in terms of the supply and consumption of electricity from RES sources, a critical level of only 13% of final consumption is recorded, which imposes serious problems on national security if considering the emerging trends of electrification of final consumption as well as consumption levels observed at the international level. Based on the above, we propose extracting the electricity segment from the proposed forecasts and projecting them until 2025 year and respectively until 2030 year considering (Figure 2.):

- *The historical average annual GDP growth rate of 5,29% during the period of 2011-2021 years;*
- *EU's target of 34% generation from renewable sources in the final electricity consumption (until 2025 year) and respectively 38% (until 2030 year);*
- *The current regional and international energy crisis urges the need to identify funding sources for investments in new RES plants, which will be develop quite actively until 2025 year;*
- *The undeveloped potential of Moldova's energy from RES sources amounts to approximately 27 GW of capacity (IRENA, 2019);*
- *RES distributive generation leads to little losses in the electrical network, respectively we will consider the electricity generation from RES sources equal to its consumption;*
- *In the period of 2025-2030 years, the generation of electricity from RES sources will slow down due to the infrastructure limitations of the electricity networks that exist, as well as the existing balancing limitations.*

Figure 2.

Forecasts of RES electricity generation growth considering the optimistic, medium and pessimistic scenarios



Source: calculated based on NBS and the World Bank (WB) data

The optimistic and medium scenarios of the proposed forecast envisage reaching ambitious but realistic levels of RES technologies' integration in final consumption of the economic and residential sectors. It is worth mentioning that the current national electric system and infrastructure network can absorb the proposed volumes of intermittent energy, whereas maintaining the same ambitious levels of RES integration after the 2025 year is conditioned by ambitious investments in the modernization and adjustment of the national energy infrastructure.

To determine the extent to which some segments of Moldova's economy are energy consumers, it is necessary to measure the energy intensity indicator of the various national economic sectors according to the formula (4). As input data, NBS data will be used that reflect the amounts of energy required for the economic production of the industrial, agricultural and services' sectors, as well as World Bank's data on GDP levels in Moldova (Table 2.):

Table 2.

The evolution of energy intensity levels of Moldova's economy in the period of 2011-2021 year

Sector/Indicator	2011	2013	2015	2017	2019	2021
Final Energy Consumption (thousand toe)	2 406	2 390	2 455	2 719	2 739	2 924
GDP (M USD)	8 414	9 497	7 745	9 670	11 970	13 680
Total Energy Intensity (EI) (toe/GDP unit)	0,285	0,251	0,317	0,281	0,229	0,214
Final Energy Consumption of the Agricultural Sector (thousands toe)	69	64	74	107	123	161
Agricultural Sector GDP						
(M USD)	957,5	1 096,9	891,4	1 109,1	1 217,3	1 421,4
Agricultural Sector EI (toe/GDP unit)	0,072	0,058	0,083	0,096	0,101	0,096
Final Energy Consumption of the Industrial Sector (thousands toe)	235	257	209	217	234	245
Industrial Sector GDP (M USD)	1 759,4	2 051,3	1 757,3	2 114,8	2 696,8	2 819,4
Industrial Sector EI (toe/GDP unit)	0,134	0,125	0,119	0,103	0,087	0,081
Final Energy Consumption of the Services Sector (thousands toe)	277	259	260	267	272	290
Services Sector GDP (M USD)	4 507,4	5 014,4	4 097,1	5 144,4	6 502,1	7 503,5
Services Sector EI (toe/GDP unit)	0,061	0,052	0,063	0,052	0,042	0,037

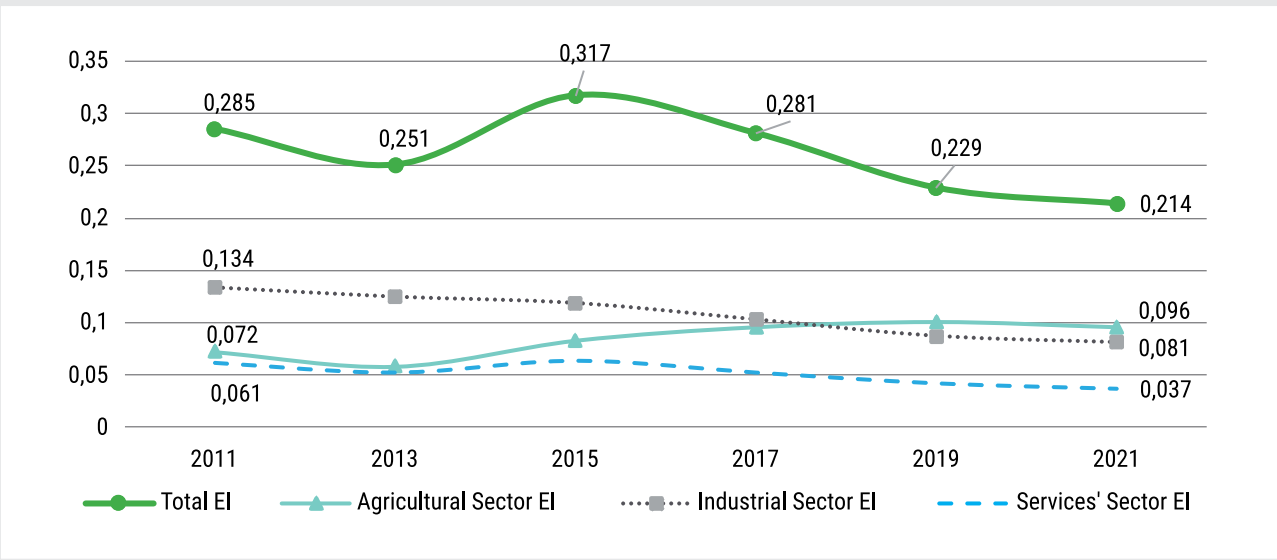
Source: calculated based on NBS and the World Bank (WB) data

In order to identify the energy intensity levels of the three economic sectors of Moldova was used the (3) relationship. As we can see, the aggregated final energy intensity at the economy level shows a 33,17% decrease trend during the 2011-2021 years. This result demonstrates that Moldova is going through various transitions in terms of the development and specialization of the national economy, including changes in the structure of the economy, with the dominant engine of country's economic growth being the services' sector. Thus, the analysis identified a 64,86% decrease in energy intensity of the services' sector and a 65,43% decrease for the industrial sector. During the entire analysed period, the services' sector contributed with more than 50% to the country's GDP composition and the volume of GDP poured into the total GDP increased by 66%. Similarly, in the industry sector, which contributed on average with more than 20% to the country's GDP composition, a 60% increase in the GDP volume of the sector poured into the total GDP is attested. Therefore, we can rely on an improved yield of the economic productivity of the services and industry sectors, that is a result of the energy management solutions and technologies implementation, as well as a possible migration towards the types of economic activities that are less energy-consuming, which leads to the efficiency of economic activities.

At the same time, a trend of 25% increase in the energy intensity of the agricultural sector was identified, given that the sector recorded a 48% increase in the volume of GDP poured into the total GDP, but also a historic decrease of 1 % in the contributions to the country's GDP composition. In this case we can talk about an astringent need to integrate efficient technologies and processes while maintaining high standards of labor competitiveness, product quality and compliance with European and international standards and to aggressively develop market linkages to facilitate trade and investment, especially under the DCFTA trade liberalization agreement with the EU.

Monitoring the energy intensity of economies is a tool that provides valuable data for informing the adaptation of energy sector management policies and development strategies towards transitions focused on less energy-consuming activities, more active RES generation, and higher energy efficiency rates (see Figure 3):

Figure 3.
The evolution of Moldova's energy intensity levels during 2011-2021 years



Source: calculated based on NBS and the World Bank (WB) data

During the period of 2015-2021 years (Figure 3), the intensity of Moldova's economy registered a 33,17% improvement of production efficiency. This trend is primarily determined by the industrial and services' sectors, which show decreases of 65,43% and 64,86%, respectively, while the agricultural sector registers an increase of approximately 25,0%, given the traditional energy consumption at the level of several economic subsectors.

The analysis of the energy demand includes the indicator of the total productivity of the economy, which refers to the measurements of the outputs of the production processes at the level of economic sectors and their efficiency (Table 3).

Table 3.
Analysis of the energy efficiency of production processes at the level of the main Moldova's economic sectors

	2011	2013	2015	2017	2019
Total Productivity Factor (Q)*	0,94	0,98	0,95	1,0	1,03
Si(agriculture)	11,38	11,55	11,51	11,47	10,17
Si(industry)	20,91	21,60	22,69	21,87	22,53
Si(services)	53,57	52,80	52,98	53,20	54,32
Eli (agriculture)	0,072	0,058	0,083	0,096	0,101
Eli (industry)	0,134	0,125	0,119	0,103	0,087
Eli (services)	0,061	0,052	0,063	0,052	0,042
I(agriculture)	-	-0,158	-0,153	0,241	0,524
I (industry)	-	-0,191	-0,517	-1,203	-2,367
I (services)	-	-0,466	-0,352	-0,851	-1,958
S(agriculture)	-	0,009	0,024	0,037	-0,085
S(industry)	-	0,085	0,279	0,353	0,453
S(services)	-	-0,039	-0,081	-0,089	-0,042
Q(agriculture)	-	0,027	0,048	0,121	0,205
Q(industry)	-	0,108	0,135	0,247	0,392
Q(services)	-	0,110	0,167	0,304	0,456

Source: author's calculations
**Note: The University of Groningen database was used for the total productivity factor indicator (https://www.rug.nl/ggdc/productivity/pwt/)*

Also, to analyse the changes in the total energy demand of the three economic sectors of Moldova, the (4) relationships were used.

DISCUSSIONS

The results show that at the level of changes in the technological efficiency of energy use (I) is recorded an increase of 320,17% for the services' sector and for the industrial sector the increase is by 12 times. In the services sector, the improvement of the indicator was possible thanks to the active adoption of modern and efficient technologies. In the industrial sector, the processes driving the improvement of the technological efficiency of energy use showed a greater amplitude, which was determined by the active adoption of efficient technologies and the more efficient allocation of resources. In the agricultural sector, the situation is different. It regressed by 231,65% during the analyzed period, mainly due to inadequate risk mitigation measures related to limited access to irrigation and meteorological factors. Additionally, the reduced adoption of modern and innovative agricultural technologies with energy-efficient consumption has contributed to this regression.

At the same time, for the indicator of changes in the structure of economic activities (S), a decommissioning economic process in the agricultural sector is identified. This process is attributed to the sector's failure to adapt to modern and innovative market structures, as well as its reliance on outdated methods and processes from a systemic perspective. The industrial sector recorded a remarkable improvement in the structure of economic

activities of 432,94%, which speaks of an active transition of economic activities to modern market structures, and a continuous monitoring and evaluation of economic processes to continuously adapt the economic activities. In the case of the services sector, we can identify a 7,69% decrease in the efficiency of the structure of economic activities, which is not significant and doesn't impact other indicators analyzed in the study. The agricultural sector's structure of economic activities recorded the most dramatic regress in the period of 2005-2010 years, with an 844,44% decrease trend in the efficiency of the established market structures.

Respectively, the rise in energy intensity trends within the national economy could also be attributed to a potentially more significant shift towards an informal economy. Although there are observed trends of improving energy intensity in the economy, Moldova's companies have made very limited progress in terms of efficiency and competitiveness. The World Bank (WB, 2013) study findings during the 2003-2011 years demonstrate a negative total factor productivity of the economy in both the industrial and agricultural sectors, with modest progress recorded in the services sector. The main obstacles that Moldova's economy is facing are political instability, corruption, an unprepared and uneducated workforce, as well as a reduced access to financing (EBRD, 2014). The results identified at the economy's intensity level of Moldova can be explained by identifying changes in the technological efficiency of energy use at the level of economic sectors, changes in the structure of economic activities, or changes at the level of economic activities.

In order to achieve a higher level of development of the RES market in Moldova and prevent the emergence of energy shortage problems on the local market, it is crucial to protect the interests of economic agents and citizens. Additionally, a robust RES market represents an essential source of investment for the country's economic development. To achieve this, it is necessary to attract the required volume of investments by promoting innovative market reforms, implementing a liberalization agenda, and ensuring equal competition within the sector.

Moldova's energy consumption tends to remain relatively uniform compared to its GDP growth levels. The country does not invest significantly in economic growth or new industrial activities and processes, primarily focusing on ensuring the necessary energy demand levels for consumers in the residential sector. These findings underscore Moldova's position among the group of former socialist countries that still exhibit features of inherited economies and are actively engaged in the process of restructuring their economies.

CONCLUSIONS

The decreasing trend of final energy intensity is expected to align to the values recorded in developed European countries as Moldova's national economy transitions towards the structure and models seen in Western economies. This improvement in energy intensity is driven by more rational energy consumption and increasing technology adoption in the industrial and service sectors.

However, the agricultural sector shows a contrasting trend with increasing energy intensity over time. This can be attributed to the low integration rate of modern and innovative agricultural technologies and energy-efficient processes. The lack of integration hampers efforts to mitigate risks related to limited access to irrigation, meteorological data factors, and compliance with high workforce competitiveness and product quality standards required to meet European and international benchmarks.

The research presented in this paper expands the existing knowledge on RES investment management. The focus on forecasting RES integration scenarios, particularly in the electricity segment, and promoting investments in Moldova until 2025 and 2030 is commendable. The findings from this research can serve as valuable insights for policymakers in designing renewable energy policies and encouraging investments in modern renewable energy technologies to produce electricity.

Moreover, the proposed methodology and results hold general relevance and can be applied in assessments for other countries in the region with emerging economies. To enhance the research further, incorporating expert interviews and case study assessments could help explore other nuances and aspects within the sector that contribute to the topic under investigation. This comprehensive approach would enrich the study and offer a more robust foundation for policy recommendations and investment decisions.

REFERENCES

Abdullahi, D., Suresh, S., Renukappa, S., & Oloke, D. (2017). Key barriers to the implementation of solar energy in Nigeria: a critical analysis.In IOP Conference Series Earth Environmental Science: 2nd International Conference on Green Energy Technology (ICGET 2017), 18-20 July 2017, Rome, Italy, 83, 012015. https://doi.org/10.1088/1755-1315/83/1/012015

Ang, B. W., & Zhang, F. Q. (2000). A survey of index decomposition analysis in energy and environmental studies. Energy, 25(12), 1149-1176. https://doi.org/10.1016/S0360-5442(00)00039-6

Ang, B. W. (2004). Decomposition analysis for policymaking in energy: Which is the preferred method? Energy Policy, 32(9), 1131-1139. https://doi.org/10.1016/S0301-4215(03)00076-4

Badri, M. A. (1992). Analysis of demand for electricity in the United States. Energy, 17(7), 725-733. https://doi.org/10.1016/0360-5442(92)90080-J

Cohen, J. J., Azarova, V., Kollmann A., & Reichl, J. (2021). Preferences for community renewable energy investments in Europe. Energy Economics, 100, 105386. https://doi.org/10.1016/j.eneco.2021.105386

Dato, P. (2018). Investment in energy efficiency. Adoption of renewable energy and household behavior: evidence from OECD countries. The Energy Journal, 39(3), 213-44. https://www.jstor.org/stable/26534449

Debnath, K. B. & Mourshed, M. (2018). Forecasting methods in energy planning models. Renewable and Sustainable Energy Reviews, 88, 297-325. https://doi.org/10.1016/j.rser.2018.02.002

Deeble, V. C., & Probert, S. D. (1986). Straight-line correlations for annual energy-consumption predictions? Applied Energy, 25(1), 23-39. https://doi.org/10.1016/0306-2619(86)90060-7

Egli, F. (2020). Renewable energy investment risk: an investigation of changes over time and the underlying drivers. Energy Pol, 140, 111428. https://doi.org/10.1016/j.enpol.2020.111428

European Bank for Reconstruction and Development (EBRD). (2014). Study of the Business Environment and Enterprise Performance, BEEPS V (2011-2014). London. http://ebrd-beeps.com

Greene D. L., (2009). Measuring Energy Sustainability. In T. E. Graedel & E. van der Voet (Eds.), Linkages of Sustainability (Vol. 4, pp. 354-373). Cambridge: The MIT Press. https://doi.org/10.7551/mitpress/8455.003.0026

Gropa, V. (2018). Estimation of the wind power impact on the power system of the Republic of Moldova [Doctoral thesis]. Technical University of Moldova. http://www.cnaa.md/en/thesis/52069/

Hotărâre cu privire la aprobarea limitelor de capacitate, a cotelor maxime și a categoriilor de capacitate în domeniul energiei electrice din surse regenerabile valabile până la data de 31 decembrie 2025, nr. 401 din 08-12-2021. (2021). Monitorul Oficial al Republicii Moldova, 302-306, art. 684. https://www.legis.md/cautare/getResults?doc_id=128987&lang=ro

International Renewable Energy Agency (IRENA). (2019). Renewables Readiness Assessment: Republic of Moldova. https://mc-cd8320d4-36a1-40ac-83cc-3389-cdn-endpoint.azureedge.net/-/media/Files/IRENA/Agency/Publication/2019/Feb/IRENA_RRA_Moldova_2019_EN.pdf?rev=ee83faa67c5f457e86835305d2ed29d4

Kitzing, L. (2014). Risk implications of renewable support instruments: Comparative analysis of feed-in tariffs and premiums using a mean-variance approach. Energy, 64, 495-505. https://doi.org/10.1016/j.energy.2013.10.008

Kleinpeter, M. (1995). Energy planning and policy. England: John Wiley & Sons Ltd.

Labys, W. C. (1990). Econometric supply models. Energy 15(7-8), 545-547. https://doi.org/10.1016/0360-5442(90)90003-K

Lee, A. H. I., Kang, H.-Y., & Huang, T.-T. (2017). Project Management Model for Constructing a Renewable Energy Plant. Procedia Engineering, 174, 145-154. https://doi.org/10.1016/j.proeng.2017.01.186

Liu, X., & Zeng, M. (2017). Renewable energy investment risk evaluation model based on system dynamics. Renewable and Sustainable Energy Reviews, 73, 782-788. https://doi.org/10.1016/j.rser.2017.02.019

Michalik, G., Khan, M. E., Bonwick, W. J., & Mielczarski, W. (1997). Structural modelling of energy demand in the residential sector: 1. Development of structural models. Energy, 22(10), 937-947. https://doi.org/10.1016/s0360-5442(97)00029-7

Movilla, S., Miguel, L. J., & Blázquez, L. F. (2013). A system dynamics approach for the photovoltaic energy market in Spain. Energy Policy, 60, 142-154. https://doi.org/10.1016/j.enpol.2013.04.072

Nasalciuc, I. (2016a). Economic aspects of fossil fuel social costs. Why do we subsidize and mediate the climate change process? The Journal Contemporary Economy = Revista Economia Contemporană 1(4), 133-147. http://www.revec.r o/papers/160409.pdf

Nasalciuc, I. (2016b). Managing the renewable energy grid integration process: risks and challenges. Journal of Financial and Monetary Economics, 3, 203-214. https://ideas.repec.org/a/vls/rojfme/v3y2016i1p203-214.html

Moldova National Development Strategy (NDS) "European Moldova 2030". (2022). Monitorul Oficial al Republicii Moldova, 409-410, art. 758. https://monitorul.gov.md/ro/monitorul/view/pdf/2579/part/1#page=30

Prasad, R. D., Bansal, R. C., & Raturi, A. (2014). Multi-faceted energy planning: A review. Renewable and Sustainable Energy Reviews, 38, 686-699. http://repository.usp.ac.fj/7558/1/Multi_-_faceted_energy_planning-a_review.pdf

Qiu, D., Dinçer, H., Yüksel, S., & Ubay, G. G. (2020). Multi-faceted analysis of systematic risk-based wind energy investment decisions in E7 economies using modified hybrid modeling with IT2 Fuzzy Sets. Energies, 13, 1423. https://doi.org/10.3390/en13061423

Schiera, D. S., Minuto, F. D., Bottaccioli, L., Borchiellini, R., & Lanzini, A. (2019). Analysis of rooftop photovoltaics diffusion in energy community buildings by a novel GIS- and agent-based modeling Co-simulation platform. IEEE Access, 7, 93404-93432. https://doi.org/10.1109/ACCESS.2019.2927446

Schinko, T., & Komendantova, N. (2016). De-risking investment into concentrated solar power in North Africa: Impacts on the costs of electricity generation. Renewable Energy, 92, 262-272. https://doi.org/10.1016/j.renene.2016.02.009

Schwerhoff, G., & SY, M. (2017). Financing renewable energy in Africa - Key challenge of the sustainable development goals. Renewable and Sustainable Energy Reviews, 75, 393-401. https://doi.org/10.1016/j.rser.2016.11.004

Shaktawat, A., & Vadhera, S. (2021). Risk management of hydropower projects for sustainable development: a review. Environment, Development and Sustainability, 23(8), 45-76 https://doi.org/10.1007/s10668-020-00607-2

Sterman, J. D. (1988). Modelling the formation of expectations: The history of energy demand forecasts. International Journal of Forecasting, 4(2), 243-259. https://doi.org/10.1016/0169-2070(88)90080-5

Sterman, J. D., Richardson, G. P., & Davidsen, P. (1988). Modelling the estimation of petroleum resources in the United States. Technological Forecasting and Social Change, 33(3), 219-249. https://doi.org/10.1016/0040-1625(88)90015-7

Taghizadeh-Hesary, F., &Yoshino, N. (2020). Sustainable Solutions for Green Financing and Investment in Renewable Energy Projecte. Energies, 13(4), 788. https://doi.org/10.3390/en13040788

World Bank. (2013). Moldova - Policy priorities for private sector development: Main report. (English). Washington, D.C.: World Bank Group. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/720051468275127219/main-report

World Energy Council. (2022). World Energy Trilemma Index 2022. https://www.worldenergy.org/publications

Zmeureanu, R. (1992). A new method for evaluating the normalized energy consumption in office buildings. Energy, 17(3), 235-246. https://doi.org/10.1016/0360-5442(92)90051-Z

LONGITUDINAL METHOD APPROACH IN ASSESSING THE MOLDOVAN MIGRANT STOCK

DOI: https://doi.org/10.36004/nier.es.2023.1-03
JEL classification: F22, J10, J11, O15
UDC: 314.15(478)

Vitalie ȘTÎRBA,
Scientific Researcher, National Institute for Economic Research, Academy of Economic Studies of Moldova
PhD Student, Department of Demography and Geodemography, Charles University, Czechia

https://orcid.org/0000-0001-5948-6509
e-mail: vitalie.stirba@ccd.ince.md

Andrei CRIVENCO,
PhD in Geography, Associate Professor, Shevchenko Pridnestrovian State University, Moldova

https://orcid.org/0000-0002-3096-6979
e-mail: crivenco@inbox.ru

Received 12 January 2023
Accepted for publication 18 May 2023

ACKNOWLEDGEMENTS

The study was carried out within the project 20.80009.0807.21 ”Migration, demographic changes and situation stabilisation policies”, 2020-2023.

SUMMARY

Estimating international migration is a challenging exercise despite the information technologies used, regular censuses conducted, and available advanced administrative systems in collecting data on vital events. Recent works estimated the stocks and flows of Moldovan migrants mainly by using national administrative sources on population counts and data from the population censuses in the destination countries. This study aims to assess the stock of Moldovan migrants of the 1980–1995 birth cohorts, for which a longitudinal method was applied. Thus, we compared the *de facto* population of the corresponding generations to their initial size, adjusting by survival rate. The results show the existing stock of Moldovan migrants of the 1980–1995 year of birth and the impact of outmigration on the changes in the size of the corresponding cohorts as of 2016 and its trend until 2022. During the analysed period was emphasised a plateau in the migrant stock of the generations born in the early 1980s with a moderate return migration in the 2020–2022. On the other hand, the cohorts of the late 1980s and 1990s registered a significant increase in the number of migrants, because they have reached a high migration mobility ages. The study covers the entire territory of Moldova, including the left bank of the Nistru River and Bender municipality (Transnistria region). The methodological part provides a complete description of the method applied, which might be further considered for estimating the migrant flows and stocks by using vital statistics or population census data.

Keywords: *migrant stock, cohort study, outmigration, Moldova, population dynamics, net migration*

Estimarea migraţiei internaţionale rămâne a fi un exerciţiu complex în pofida disponibilităţii unui spectru larg de instrumente, precum recensămintele populaţiei, resursele administrative de evidenţă a populaţiei şi tehnologiile informaţionale avansate. Studiile recente au estimat stocul şi fluxurile migranţilor moldoveni folosind datele naţionale şi din ţările de destinaţie al statisticii migratorii şi al recensămintelor populaţiei. În acest articol sunt prezentate rezultatele cercetării care a avut ca scop evaluarea stocului de migranţi moldoveni din cohortele născute în anii 1980–1995 în baza metodei de analiză longitudinală. Astfel, a fost comparată populaţia de facto a generaţiilor corespunzătoare cu mărimea iniţială a cohortelor, ajustată la rata de supravieţuire. Rezultatele studiului prezintă stocul existent de migranţi moldoveni născuţi în anii 1980–1995 şi impactul emigraţiei asupra schimbărilor în dimensiunea generaţiilor corespunzătoare pentru perioada 2016–2022. În urma cercetării s-au evidenţiat schimbări minore în stocul de migranţi ale generaţiilor născute la începutul anilor 1980, care înregistrează valori moderate ale migraţiei de reîntoarcere, în special pentru perioada 2020–2022. În acelaşi timp, cohortele născute la sfârşitul anilor 1980 - începutul anilor 1990 au înregistrat o creştere semnificativă a numărului de migranţi în perioada studiată, dat fiind faptul că au ajuns la vârstele de mobilitate migratorie ridicată. Studiul acoperă întreg teritoriul Moldovei, inclusiv malul stâng al râului Nistru şi municipiul Bender (regiunea Transnistreană). Partea metodologică a lucrării oferă o descriere completă a metodei aplicate, care poate fi utilizată în contextul estimării longitudinale a fluxurilor şi stocurilor de migranţi prin utilizarea statisticilor vitale sau a datelor recensământului populaţiei.

Cuvinte cheie: *stoc de migranți, studiu de cohortă, emigrare, Moldova, dinamica populației, migrație netă*

Оценка международной миграции нередко бывает затруднительной, несмотря на доступность широкого спектра инструментов, таких как переписи населения, административные регистры учета населения и современные информационные технологии. Последние исследования оценили контингенты и потоки молдавских мигрантов, используя национальные данные и статистику миграции в странах назначения, а также данные переписей населения. В этой статье представлены результаты исследования, целью которого была оценка контингента молдавских мигрантов из когорт, родившихся в период с 1980 по 1995 год, с использованием метода лонгитюдного анализа. Таким образом, было проведено сравнение фактического населения соответствующих поколений с исходным размером когорт, скорректированное, используя коэффициент выживаемости. Результаты исследования представляют оценку контингента молдавских мигрантов, родившихся в период с 1980 по 1995 год, и влияние эмиграции на изменения в размере соответствующих поколений в период с 2016 по 2022 год. В результате исследования выявлены незначительные изменения контингента мигрантов в поколениях, родившихся в начале 1980-х годов, для которых характерна умеренная возвратная миграция, особенно в период 2020-2022 гг. В то же время, когорты, родившиеся в конце 1980-х и начале 1990-х годов, показали значительное увеличение числа мигрантов за исследуемый период, так как они находятся в возрастах высокой миграционной мобильности. Исследование охватывает всю территорию Молдовы, включая левобережье реки Днестр и город Бендеры (Приднестровский регион). В методологической части работы предоставлено полное описание используемого метода, который может быть применен для оценки лонгитюдных потоков и контингентов мигрантов на основе данных текущей статистики или данных переписи населения.имеют актуальность и могут быть полезны для других стран региона с развивающейся экономикой.

Ключевые слова: *контингент мигрантов, когортный анализ, эмиграция, Молдова, динамика численности населения, нетто-миграция*

INTRODUCTION

During the last decades, migration was the main reason for the population decline in Moldova, ultimately affecting other demographic phenomena. Consequently, outmigration caused an exodus of the labour force and depopulation, especially in rural areas, contributing to a population structure deterioration and accelerating the ageing process (Gagauz et al., 2023; Crivenco & von Löwis, 2022).

From the end of the 1980s until the mid-1990s, migration flows from Moldova included mainly ethnic minorities of Jews, Russians, Ukrainians, etc., who were involved in the process of repatriation to the countries of their origin (Tabac & Gagauz, 2020; Dietz, 2000). However, a pronounced outmigration from Moldova was registered since the end of the 1990s, which was mainly driven by the economic crises of 1998, when, in most cases, the decision to migrate was a response to high poverty in Moldova and emerging opportunities in the receiving countries (CIVIS & IASCI, 2010). Initially, the main destinations of the Moldovan migrants were CIS and EU countries (Piracha & Saraogi, 2012), while since the mid of 2010s, migration flows from Moldova have been predominantly to European countries (Tabac, 2021). Moldovan migrants initially opted for a determined period of stay in receiving countries, during which many migrants had an incentive for financial resource accumulation to improve their living conditions and cover current household spending. During the last decades, Moldovan migrants have opted for both seasonal and long-term migration (Görlich & Trebesch, 2008), depending on the destination country. Contrary to the above, migration became a life strategy for the younger generations, who consider early migration and social integration by obtaining higher education and vocational skills in the receiving countries.

Generally, emigration from Moldova is highly age-selective, involving the young and working-age population. Considering the settlement of Moldovan families in the countries of destination, there is an increase in the number of children migrating (Tabac, 2021). On the other hand, a positive net migration is observed among the population above 50, which is primarily involved in return migration.

During the years of independence of Moldova, outmigration has become an integral part of the public and socio-economic spheres of the state, shaping the patterns of the population's economic, social, institutional, and political behaviour (Barsbai et al., 2017), at the same time contributing to economic development through remittances, transfer of know-how and investment, and changes in the population's social values (Tabac & Gagauz, 2020).

The presented research aims to evaluate Moldova's long-term international net migration of the 1980–1995 generations. For this, the 2015–2022 1st January population of the corresponding cohorts were compared to their initial size (number of births) adjusted by survival rate. The study results are based on a longitudinal approach and emphasise the long-term net migration of the analysed cohorts as of 2016 and its trend until 2022. The study covers the entire territory of Moldova, including the left bank of the Nistru River and Bender municipality.

The study uses a new approach to studying international migration in Moldova by comparing the de facto population with the size of the corresponding cohorts. The method used might be further applied to countries with distorted population statistics and disrupted series of annual migration flows.

LITERATURE REVIEW

Migration is a demographic event, the reliable record of which is challenging even in countries with accurate population statistics. Generally, the migrant stocks and flows are often measured using population censuses, which collect information on population ethnicity and place of birth (Abel, 2013). Additionally, data from population censuses could be combined with administrative sources (Raymer et al., 2007). The article by Beer and colleagues describes the method of migration harmonisation when the administrative data on migration flows is available in both destination and origin countries (Beer et al., 2010). Therefore, a set of methods for estimating migration flows are also comprehensively described in the articles by Abel & Cohen (2019) and Azose & Raftery (2018). In recent times, social media platforms have been utilised to estimate the number of migrants through monitoring groups of expats and tracking migrants based on their place of birth, professional experience, and place of residence (Zagheni et al., 2017; Vieira et al., 2022).

Generally, migration is a highly selective (Rogers, 1981) and repetitive (Aude, 2017) process, which shapes the population structure and reflects on other demographic events in both origin and destination countries (Alho, 2008). In this regard, a longitudinal approach in migration studies allows for assessing the cumulative effect of the migration on changes in the cohort sizes. An eloquent example is the study by Kashnitsky, which assessed changes in the cohorts due

to internal migration in central Russia (Kashnitsky, 2020). Moreover, the article by Willson and colleagues measured the impact of migration on birth cohort sizes in European countries (Wilson et al., 2013). However, these studies rely on net migration as their basis and ignore the step migration.

An estimation of the Moldovan migrant stock was made by Tabac, where the studies were based on population censuses and administrative sources in Moldova and receiving countries. According to the results presented, during the 2001 and 2011 census rounds in receiving countries, the Moldovan migrant stock was estimated at 338 thousand and 657 thousand, respectively (Tabac & Gagauz, 2020). On the other hand, based on data from population censuses, population registers, and national representative surveys, the United Nations Population Division estimates the 2020 migrant stock originated from Moldova at 1.1 million (United Nations, 2020).

In conditions of distorted population statistics, to adjust the population structure, Penina and colleagues estimated the stock of Moldovan migrants by using administrative data on border crossings from the population register, where is concluded that about 18% of the total population in 2014 were emigrants who did not live in Moldova (Penina et al., 2015). A similar approach in using data on border crossings from the population register was used by Gagauz, where the estimated net migration for the 2005–2013 period was 363 thousand (Gagauz, 2023). Ultimately, this method is used by the NBS for vital statistics evidence.

DATA SOURCES AND METHODS

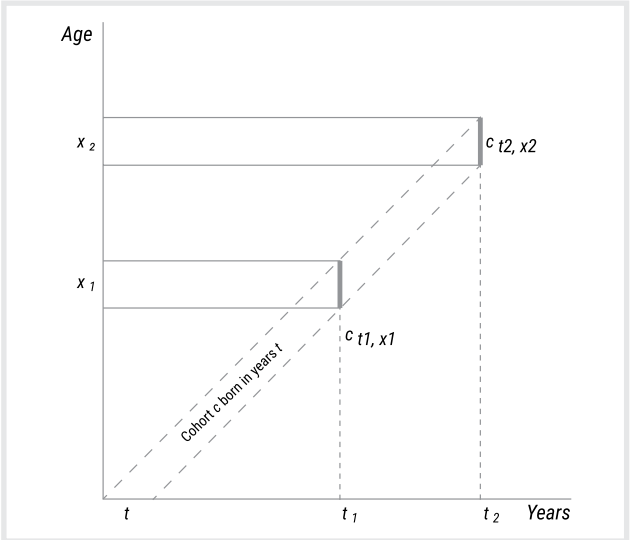
Using data on birth counts and age- and sex population with usual residence, we estimated the Moldovan migrant stock as of 1st January 2016 and its trend until 2022. In the method used, we subtract the number of usual resident population on 1st January from its initial cohort size. To eliminate the effect of mortality, the life table probabilities of survival were applied. Thus, the arithmetic difference between the expected and *de facto* 1st January population corresponds with the estimated migrant stock. The research includes the entire territory of Moldova, including the left bank of the Nistru River and Bender municipality.

The data on birth counts of the studied cohorts were retrieved from the NBS. The age- and sex population distribution were obtained from NBS and, by request, from the Transnistrian Statistical Office. Considering that in the Transnistrian region, the vital statistics include the permanently absent population, we adjusted its age- and sex structure according to net migration rates calculated based on data from the Moldovan Border Police.

To adjust the cohort size by survival rate, we used life tables of the generations of the corresponding year of birth calculated by Penina and colleagues (Penina et al., 2015).

Figure 1 shows the Lexis diagram that reveals the applied method, where: (1) c is the hypothetical cohort born in the year t; and (2) c_{t1},x_1 and c_{t2},x_2 are the population stocks of cohort c on 1st January of the years t_1 and t_2 at the age x_1 and x_2. To exclude the effect of mortality on the generations studied, we adjusted the birth cohort size by survival rate.

Figure 1.
*The Lexis chart shows the method of estimation of the net migration within the hypothetical cohort **c** born in year t on 1st January of years t1, t2 at age x1, x2*



The estimation of the net outmigration of the 1980–1995 birth cohorts is made according to the following formula:

$$c_{t1,x1}=c_t\times p_{x1,t1}-P_{t1,x1};$$

where (1) c_t is the initial cohort size; (2) $p_{x1,t1}$ is the probability of surviving from birth to the age $x_{1,t1}$; and (3) $P_{t1,x1}$ is the population of the respective cohort c_t on the 1st of January of the year t_1.

Table 1 illustrates the applied method of Moldovan migrant stock estimation. There is revealed the initial cohort size of the studied generations, the probability of their survival to 1st January 2016, and the population with usual residency of the corresponding cohorts.

Table 1.

Illustration of the method of estimation of migrant stock by using cohort size, probability of survival, and population with usual residency

Year of birth (1)	Cohort size (2)		Probability of survival to 1st January 2016 (3)		Population with usual residency on 1st January 2016 (4)		Expected cohort size on 1st January 2016, adjusted by survival rate (5)	Estimated migrant stock (6)
	Males	Females	Males	Females	Males	Females		
1980	40687	38893	0.899	0.939	23541	23918	(2) x (3)	(5) - (4)
1981	42210	40069	0.898	0.940	23967	23718		
1982	42751	40507	0.907	0.944	24688	24345		
1983	46594	44710	0.913	0.949	27008	26648		
1984	46234	43403	0.914	0.949	27248	26325		
1985	46366	44087	0.922	0.953	28119	27356		
1986	48821	45905	0.931	0.960	29597	28611		
1987	47190	44572	0.940	0.960	29024	28139		
1988	45473	43095	0.938	0.964	28432	27922		
1989	42212	40009	0.942	0.966	27743	26851		
1990	39499	37586	0.949	0.969	26683	26120		
1991	36946	35074	0.953	0.969	25162	24895		
1992	35727	33927	0.949	0.971	25367	25234		
1993	33975	32204	0.953	0.970	24352	24245		
1994	32030	30055	0.953	0.968	23780	23593		
1995	29044	27367	0.958	0.972	22216	21421		

Source: NBS; Tiraspol Statistical Office; Penina et al., 2015

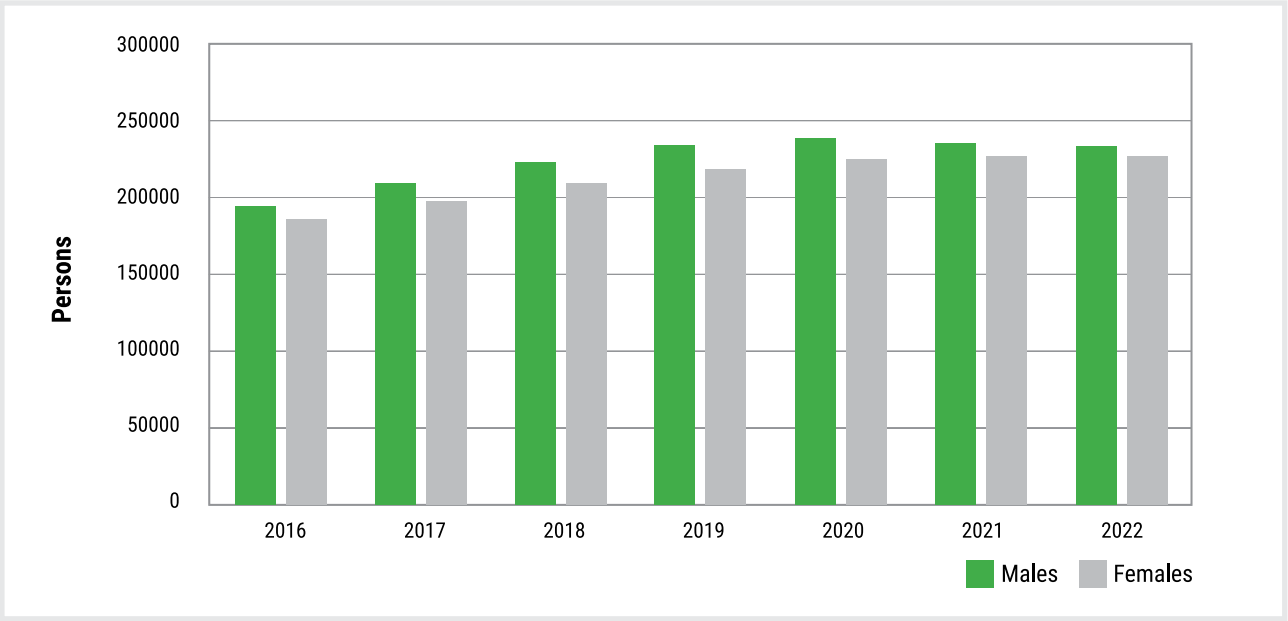
The applied method encounters a degree of error, given the use of survival rates of the period life tables. However, the studied generations are still in their youth and have been minimally exposed to the risk of death.

MAIN RESULTS

Figure 2 displays the estimated number of Moldovan migrants of the 1980–1995 cohorts during the last available period. Thus, in 2016, the estimated stock of migrants born in 1980–1995 constituted about 380 thousand, out of which 193.4 thousand were males, and 186.1 thousand were females. Gradually, the estimated stock of the corresponding cohorts in males and females increased to 406.3 thousand in 2017, 432.7 thousand in 2018, 452.0 thousand in 2019, and 464.3 thousand in 2020. The observed increase in migrant stock is merely due to the entry of young generations into the age of migration activity. In contrast, the older generations emphasise a stagnation in outmigration mobility. However, a slight decrease in the stock of Moldovan migrants was observed at the beginning of 2021 and 2022 years, corresponding with the period of migration restriction during the COVID-19 pandemic.

The estimated stock of migrants emphasises a higher degree of male involvement in international migration compared with females in the analysed years. Nevertheless, the most significant gap in male/female migrant stock was observed within the 2017–2020 period, while it narrowed in 2021 and 2022.

Figure 2.
The estimated stock of Moldovan migrants born in 1980–1995 as of 1st January 2016–2022, by sex



Source: NBS and Tiraspol Statistical Office

Among the studied cohorts, males and females (with a slight sex gap) registered a similar trend in changes in the stock of migrants during the 2016–2022 period. Generally, by 2016, the generations born in the early 1980s, to some extent, saturated their degree of involvement in international migration. The estimated stock of migrants of the 1980–1985 cohorts only slightly increased between 2016 and 2022, registering a decline in the last years (Table 2). To some extent, cohorts of the early 1980s are engaged in the process of the return migration, and their proportion in the overall stock of Moldovan migrants is slightly decreasing and likely will decline in the following years.

A significant stock of migrants in 2016 is also emphasised by the generations born in 1986–1991. However, compared with the generations born in 1980–1985, the 1986–1991 cohorts have shown a visible increase in migrant stock between 2016 and 2022 – the trend that could continue in the following years due to the high migration mobility in the young ages.

A notable increase in the 2016–2022 period in migrant stock is observed among the generations born in 1992–1995 that entered the active migration mobility ages in the period observed. However, compared to the 1980–1991 cohorts, the succeeding generations are less numerous, and a high degree of involvement in the outmigration of the population born after 1991 has a smaller impact on the changes in the migrant stock of the analysed cohorts.

Table 3 presents the proportion of Moldovan migrants of the 1980–1995 year of birth within the cohort size. Among the analysed generations, a visible disparity in the change of the cohorts' sizes was emphasised due to the net migration of the population of the corresponding year of birth. Up to 2016, the generations born in 1980–1988 lost between 31–33% of the initial cohort size due to international migration. In the 2016–2022 period, the 1980–1988 cohorts registered a varied decline in their sizes because of international migration (between -2.1 and -6.9 percentage points in both sexes), where a higher loss in generations' size was observed in younger ages. In the subsequent generations of the 1989–1991 years of birth, due to international migration, the cohorts' size declined as 2016 by 27.2–28.5% in males and by 25.9–29.5% in females, and additionally reduced by 7.7–9.0 percentage points in males and by 7.7–9.3 percentage points in females in the 2016–2022 period. In 2016, the 1992–1995 cohorts emphasised the lowest decline in their size because of the net outmigration (between -18.9% and -23.9% in males and females), and, considering the high level of migration mobility of these ages, by 2022 the overall decline in the size of the corresponding cohorts constituted 31.3–33.3% in both sexes.

Table 2.

The estimated stock of Moldovan migrants by year of birth as of 1st January 2016–2022, by sex

Year of birth	2016		2017		2018		2019		2020		2021		2022	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
1980	13033	12609	13567	12892	14082	13285	14426	13566	14411	13810	14166	13795	13865	13680
1981	13957	13965	14476	14350	15079	14844	15388	15146	15469	15390	15276	15406	15044	15414
1982	14078	13893	14691	14317	15278	14661	15647	15036	15759	15305	15589	15290	15422	15255
1983	15537	15799	16223	16256	16995	16758	17452	17222	17543	17506	17315	17521	17019	17481
1984	15024	14868	15899	15294	16524	15812	16931	16333	17074	16691	16796	16674	16710	16717
1985	14643	14664	15687	15263	16523	15791	17034	16227	17277	16683	17092	16793	17009	16779
1986	15839	15435	16867	16054	17705	16682	18141	17178	18453	17655	18311	17777	18201	17909
1987	15315	14628	16290	15275	17329	15941	17907	16569	18044	17066	17993	17148	17946	17280
1988	14241	13634	15385	14527	16466	15229	17068	15858	17412	16403	17218	16466	17278	16577
1989	12022	11815	13200	12683	14371	13523	15089	14205	15461	14724	15386	14826	15283	14890
1990	10817	10308	11961	11168	13090	11970	13751	12672	14078	13223	13900	13319	13737	13427
1991	10062	9089	11296	10093	12683	10971	13352	11601	13762	12099	13702	12238	13373	12343
1992	8532	7714	9659	8712	10769	9587	11537	10367	11935	10994	11872	11110	11765	11232
1993	8012	6979	9148	8008	10312	8979	11302	9800	11766	10460	11724	10525	11589	10667
1994	6738	5499	7938	6486	9192	7524	10196	8513	10806	9195	10915	9471	10684	9560
1995	5599	5184	6631	5999	7778	6943	8625	7865	9213	8660	9323	8865	9103	9118

Source: NBS and Tiraspol Statistical Office

Table 3.

The proportion of Moldovan migrants of the 1980–1995 year of birth within the cohort size as of 1st January 2016 and 2022, adjusted by survival rate, Moldova, by sex, %

Year of birth	2016		2017		2018		2019		2020		2021		2022	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
1980	32.0	32.4	33.3	33.1	34.6	34.2	35.5	34.9	35.4	35.5	34.8	35.5	34.1	35.2
1981	33.1	34.9	34.3	35.8	35.7	37.0	36.5	37.8	36.6	38.4	36.2	38.4	35.6	38.5
1982	32.9	34.3	34.4	35.3	35.7	36.2	36.6	37.1	36.9	37.8	36.5	37.7	36.1	37.7
1983	33.3	35.3	34.8	36.4	36.5	37.5	37.5	38.5	37.7	39.2	37.2	39.2	36.5	39.1
1984	32.5	34.3	34.4	35.2	35.7	36.4	36.6	37.6	36.9	38.5	36.3	38.4	36.1	38.5
1985	31.6	33.3	33.8	34.6	35.6	35.8	36.7	36.8	37.3	37.8	36.9	38.1	36.7	38.1
1986	32.4	33.6	34.5	35.0	36.3	36.3	37.2	37.4	37.8	38.5	37.5	38.7	37.3	39.0
1987	32.5	32.8	34.5	34.3	36.7	35.8	37.9	37.2	38.2	38.3	38.1	38.5	38.0	38.8
1988	31.3	31.6	33.8	33.7	36.2	35.3	37.5	36.8	38.3	38.1	37.9	38.2	38.0	38.5
1989	28.5	29.5	31.3	31.7	34.0	33.8	35.7	35.5	36.6	36.8	36.4	37.1	36.2	37.2
1990	27.4	27.4	30.3	29.7	33.1	31.8	34.8	33.7	35.6	35.2	35.2	35.4	34.8	35.7
1991	27.2	25.9	30.6	28.8	34.3	31.3	36.1	33.1	37.2	34.5	37.1	34.9	36.2	35.2
1992	23.9	22.7	27.0	25.7	30.1	28.3	32.3	30.6	33.4	32.4	33.2	32.7	32.9	33.1
1993	23.6	21.7	26.9	24.9	30.4	27.9	33.3	30.4	34.6	32.5	34.5	32.7	34.1	33.1
1994	21.0	18.3	24.8	21.6	28.7	25.0	31.8	28.3	33.7	30.6	34.1	31.5	33.4	31.8
1995	19.3	18.9	22.8	21.9	26.8	25.4	29.7	28.7	31.7	31.6	32.1	32.4	31.3	33.3

Source: NBS and Tiraspol Statistical Office

DISCUSIONS

The estimated stock of Moldovan migrants for the 2016–2022 period represents the net result of the migration flows during the life course of the studied cohorts of the 1980–1995 year of birth. The size of the migrant stock merely depended on the initial cohort size, which shaped the dimension of the migration flows. Consequently, the generations born in the 1980s are numerical because of the large proportion of the reproductive-aged population of their parents, who realised their reproductive intentions in conditions of pro-natalist policies of that period. On the contrary, cohorts of the 1990s are less numerical due to the shift in the population structure that declined the number of the reproductive-aged population of their parents, accompanied by a period of social and economic disturbances.

Numerical cohorts are likely to experience intragenerational competition that serves as a push factor for international migration involvement, while the smaller generations have greater job market and social mobility opportunities (Hatton & Williamson, 2003; Clark et al., 2004; Zaiceva & Zimmermann, 2014). Of course, the impact of pull and push factors on migration flows depends on social, economic, and political factors that favour the opportunities in the countries of origin and destination.

Persons of the studied cohorts perhaps experienced emigration/immigration involvement as part of a family during childhood and as individuals by reaching adulthood. Thus, by presenting the paper's results, we assume a possible early outmigration of the corresponding generations in the case of their parents' involvement in the ethnic or labour migration of the 1980s and early 1990s. However, the majority of migrants are young adults, whose numbers decrease with age.

The accumulated stock of Moldovan migrants by 2016 corresponds with the long period of outmigration in Moldova, which mainly involved large cohorts of the young mobile population. Besides the initial size of the generations, on dimensions of migration flows influenced economic and legislative factors that allowed migrants to travel, work, and live in the destination countries.

For a certain period, Moldovan migrants were involved in a circular migration (Borodak & Tichit, 2014), which was primarily a solution for accumulating financial resources and improving living conditions. Ultimately, with the increase in the number of people who have obtained citizenship of one of the destination countries (EU, Russia, Israel, etc.), a change occurred from short-term and circular to long-term migration. Moreover, after a period of stay in destination countries, many Moldovan migrants have acquired second citizenship in states such as Canada, the USA, Italy, Portugal, etc. (Tabac, 2019).

The results of this paper distinguish the migration pattern between the cohorts studied, where each generation of males and females have a higher proportion of its initial size involved in international migration. This might be explained by the influence of multiple factors, such as study migration, reduction in travel costs, or widening of the migrant networks, that facilitate social and labour market integration. Additionally, the number of Moldovans with dual citizenship has increased significantly in recent years. Thus, for the young generation, an early outmigration perhaps becomes a life strategy.

During the COVID-19 pandemic, a stagnation in Moldovan migrant stock was observed. This was primarily because of travel restrictions in most destination countries and, to a certain degree, due to return migration. The stagnation in the growth of migrant stock in the last years might also be a consequence of the entry of the early 1980s cohorts into ages with lower migration mobility. On the other hand, the generations born between 1990–1995 are less numerical and have a smaller migration capacity. Therefore, in subsequent years, due to the return migration of the 1980s cohorts, the migrants' stock of the analysed generations might decrease.

CONCLUSIONS

This study estimates the Moldovan migrant stock of the 1980–1995 birth cohorts for the 2016–2022 period, for which an indirect method was used. Thus, the results show the cumulated number of migrants during the lifetime of the cohorts studied. Therefore, the presented estimation of the Moldovan migrant stock complements the existing studies on migration in Moldova.

The results emphasised a considerable involvement of the analysed cohorts in international migration, which contributed to an increase in the migrant stock. The main number of migrants from the studied cohorts are from numerous generations born in the 1980s. On the contrary, the less numerous generations born in the 1990s have a smaller proportion in the overall migrant stock of the 1980–1995 year of birth. A stagnation in the growth of the migrant stock of the studied cohorts was noticed during the COVID-19 pandemic. However, after removing all border-cross restrictions, no increase in the number of migrants born in 1980–1995 was observed, which can be explained by the exhaustion of the migration resources and the entry of numerical

cohorts born in the early 1980s into ages with low migration mobility.

Even though a significant decline in the population of the 1980–1995 cohorts due to outmigration was observed, further optimistic scenarios may be considered. Thus, in the condition of a favourable environment, the registered losses in analysed birth cohorts could be compensated by the Moldovan returnees and long-term immigrants.

The method applied in migrant stock estimation might be further applied to other countries and regions by using vital statistics or census data.

REFERENCES

Abel, G. (2013). Estimating global migration flow tables using place of birth data. Demographic Research, 28, 505-546. https://doi.org/10.4054/DemRes.2013.28.18

Abel, G., & Cohen, J. (2019). Bilateral international migration flow estimates for 200 countries. Scientific Data, 6, PMID: 31209218. https://doi.org/10.1038/s41597-019-0089-3

Alho, J. (2008). Migration, fertility, and aging in stable populations. Demography, 45(3), 641-650. https://doi.org/10.1353/dem.0.0021

Aude, B. (2017). Levels and patterns of internal migration in Europe: A cohort perspective. Population Studies, 71(3), 293-311. https://doi.org/10.1080/00324728.2017.1360932

Azose, J., & Raftery, A. (2018). Estimation of emigration, return migration, and transit migration between all pairs of countries. PNAS, 116(1), 116-122. https://doi.org/10.1073/pnas.1722334116

Barsbai, T., Rapoport, H., Steinmayr, A., & Trebesch, C. (2017). The Effect of Labor Migration on the Diffusion of Democracy: Evidence from a Former Soviet Republic. American Economic Journal: Applied Economics, 9(3), 36-69. https://doi.org/10.1257/app.20150517

Beer, J., Raymer, J., van der Erf, R., & van Wissen, L. (2010). Overcoming the problems of inconsistent international migration data: A new method applied to flows in Europe. European Journal of Population, 26(4), 459-481. https://doi.org/10.1007/s10680-010-9220-z

Borodak, D., & Tichit, A. (2014). Should we stay or should we go? Irregular migration and duration of stay: The case of Moldovan migrants. Migration Studies, 2(3), 415-447. https://doi.org/10.1093/migration/mnt016

CIVIS, & IASCI. (2010). Strengthening the Link between Migration and Development in Moldova. Chișinău. http://civis.md/Archive/CIVIS_IASCI_WB_Migration%20and%20development_report.pdf

Clark, X., Hatton, T., & Williamson, J. (2004). What Explains Emigration Out of Latin America? World Development, 32(11), 1871-1890. https://doi.org/10.1016/j.worlddev.2004.06.011

Crivenco, A., & von Löwis, S. (2022). Shrinking Transnistria. Trends and Effects of Demographic Decline in a De Facto State. Comparative Southeast European Studies, 70(1), 47-79. https://doi.org/10.1515/soeu-2021-0089

Dietz, B. (2000). German and Jewish migration from the former Soviet Union to Germany: Background, trends and implication. Journal of Ethnic and Migration Studies, 26(4), 635-652. https://doi.org/10.1080/713680499

Gagauz, O. (2023). Recalcularea numărului populației Republicii Moldova, 2004-2014. Chișinău. https://doi.org/10.36004/nier.2023.978-9975-147-86-6

Gagauz, O., Tabac, T., & Pahomii, I. (2023). Depopulation in Moldova: The main challenge in the context of extremely high emigration. Vienna Yearbook of Population Research, 21, 1-25. doi:10.1553/p-ke2z-76zz. https://austriaca.at/0xc1aa5576_0x003e2751.pdf

Görlich, D., & Trebesch, C. (2008). Seasonal Migration and Networks -Evidence on Moldova's Labour Exodus. Review of World Economics, 144(1), 107-133. https://doi.org/10.1007/s10290-008-0139-y. https://www.econstor.eu/bitstream/10419/4282/1/562852557.pdf

Hatton, T., & Williamson, J. (2003). Demographic and Economic Pressure on Emigration out of Africa. The Scandinavian Journal of Economics, 105(3), 465-486. https://doi.org/10.1111/1467-9442.t01-2-00008

Kashnitsky, I. (2020). Russian periphery is dying in movement: a cohort assessment of internal youth migration in Central Russia. GeoJournal, 85, 173-185. https://doi.org/10.1007/s10708-018-9953-5

National Bureau of Statistics of the Republic of Moldova. (n.d.). Statistical databank "Statbank". https://statistica.gov.md/en/banca-de-date-statistice-78.html

Penina, O., Jdanov, D., & Grigoriev, P. (2015). Producing reliable mortality estimates in the context of distorted population statistics: the case of Moldova. MPIDR Working Paper WP, 011, 1-35. https://doi.org/10.4054/MPIDR-WP-2015-011. http://www.demogr.mpg.de/en/projects_publications/publications_1904/mpidr_working_papers/producing_reliable_mortality_estimates_in_the_context_of_distorted_population_statistics_the_case_5498.htm

Piracha, M., & Saraogi, A. (2012). The Determinants of Remittances: Evidence from Moldova. Oxford Development Studies, 40(4), 467-491. https://doi.org/10.1080/13600818.2012.729573

Raymer, J., Abel, G., & Smith, P. (2007). Combining census and registration data to estimate detailed elderly migration flows in England and Wales. Journal of the Royal Statistical Society. Series A: Statistics in Society, 170(4), 891-908. https://doi.org/10.1111/j.1467-985X.2007.00490.x

Rogers, A., & Castro, L. J. (1981). Model Migration Schedules. Research Report RR-81-30. International Institute for Applied Systems Analysis. Laxenburg, Austria. https://pure.iiasa.ac.at/id/eprint/1543/1/RR-81-030.pdf

Tabac, T. (2019). Acquisition of foreign citizenship by Moldovan immigrants. Economy and Sociology, 2, 104-116. https://doi.org/10.36004/nier.es.2019.2-09

Tabac, T. (2021). International migration and population changes in Moldova. Economy and Sociology, 2, 94-102. https://doi.org/10.36004/nier.es.2021.2-08

Tabac, T. (2021). Migrația populației. In: Gagauz, O., Buciuceanu-Vrabie, M., Pahomii, I., Ștîrba, V., Tabac, T., & Grigoraș, E. Populația Republicii Moldova la 30 de ani de independență: provocări principale și politici necesare (pp. 97-120). https://doi.org/10.36004/nier.ccd.2021.978-9975-89-248-3

Tabac, T., & Gagauz, O. (2020). Migration from Moldova: Trajectories and Implications for the Country of Origin. In: Denisenko, M., Strozza, S., & Light, M. (Eds.), Migration from the Newly Independent States. Societies and Political Orders in Transition (pp. 143-168). Springer, Cham. https://doi.org/10.1007/978-3-030-36075-7_7

United Nations. (2020). International Migrant Stock 2020: methodology report. https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/undesa_pd_2020_international_migrant_stock_documentation.pdf

Vieira, C. C., Fatehkia, M., Garimell, K., Werber, I., & Zagheni, E. (2022). Using Facebook and LinkedIn data to study international mobility. Data Science for Migration and Mobility, 141-158. https://doi.org/10.5871/bacad/9780197267103.003.0007

Wilson, C., Sobotka, T., Williamson, L., & Boyle, P. (2013). Migration and Intergenerational Replacement in Europe. Population and Development Review, 39(1), 131-157. https://doi.org/10.1111/j.1728-4457.2013.00576.x

Zagheni, E., Weber, I., & Gummadi, K. (2017). Leveraging Facebook's Advertising Platform to Monitor Stocks of Migrants. Population and Development Review, 43(4), 721-734. https://doi.org/10.1111/padr.12102

Zaiceva, A., & Zimmermann, K. (2014). Migration and the Demographic Shift. Discussion Paper, 8743, 1-71. https://docs.iza.org/dp8743.pdf

ASSESSING PREMATURE MORTALITY: AN INDICATOR SELECTION ANALYSIS USING DATA FROM MOLDOVA, CZECHIA, AND SWITZERLAND

DOI: https://doi.org/10.36004/nier.es.2023.1-04
JEL classification: I14, I18, C81
UDC: 314.14

Irina PAHOMII,

PhD Student, Department of Demography and Geodemography, Faculty of Science, Charles University, Prague, Czechia

Scientific Researcher, Center for Demographic Research, National Institute for Economic Research, Academy of Economic Studies of Moldova

https://orcid.org/0000-0002-6595-9146
e-mail: braga.pahomiiirina@gmail.com

Received 28 February 2023
Accepted for publication 10 May 2023

ACKNOWLEDGEMENTS

The study was carried out within the project 20.80009.0807.21 ”Migration, demographic changes and situation stabilisation policies”, 2020-2023.

SUMMARY

Premature mortality is a very complex concept, and even though it is widely studied in the specialised literature, there is no broad agreement on its definition. This study aims to compare two different models of premature mortality analysis to highlight the more appropriate one for the national context. The actuality of this study is determined by the mortality level observed in the Republic of Moldova and particularly by the issue of adult male mortality level. To achieve this objective, the following indicators were compared: proportion of deaths up to a certain age threshold, Potential Years of Life Lost (PYLL), lifespan disparity and age threshold derived from lifespan disparity. Analysis was carried out in a comparative aspect. For this purpose, this study analysed data from Czechia and Switzerland. In the case of the Republic of Moldova, it is quite complicated to identify a universally accepted set of indicators that would allow the monitoring of premature mortality. The classical indicators are impacted by the age and number structure of the population. The dynamic approach indicators are exempted from the influence of age and number structure of the population but have a more complex methodology and are more complicated to interpret. However, establishing and promoting such a set of indicators is unquestionably necessary. It is important to note that the choice of indicators for monitoring premature mortality is influenced by existing scientific and actuarial interests or the goals set.

Keywords: *premature mortality, PYLL, lifespan disparity, age threshold*

Mortalitatea prematură este un concept foarte complex şi, deşi este larg studiat în literatura de specialitate, nu există un consens asupra definiţiei sale. Acest studiu îşi propune să compare două modele diferite de analiză a mortalităţii premature pentru a-l evidenţia pe cel mai potrivit contextului naţional. Actualitatea acestui studiu este determinată de nivelul de mortalitate observat în Republica Moldova şi în special de problematica nivelului de mortalitate a bărbaţilor adulţi. Pentru atingerea acestui obiectiv, au fost comparaţi următorii indicatori: proporţia deceselor până la un anumit prag de vârstă, Ani Potenţiali de Viaţă Pierduţi (APVP), disparitatea duratei de viaţă şi pragul de vârstă derivat din disparitatea duratei de viaţă. Analiza a fost efectuată sub aspect comparativ. În acest scop, studiul analizează date din Cehia şi Elveţia. În cazul Republicii Moldova, este destul de complicat să se identifice un set de indicatori universal acceptaţi care să permită monitorizarea mortalităţii premature. Indicatorii clasici sunt influenţaţi de structura pe vârste şi numărul populaţiei. Indicatorii de abordare în dinamică sunt scutiţi de influenţa structurii de vârstă şi numărul populaţiei, dar au o metodologie mai complexă şi sunt mai complicat de interpretat. Cu toate acestea, stabilirea şi promovarea unui astfel de set de indicatori este, fără îndoială, necesară. Este important de menţionat că alegerea indicatorilor pentru monitorizarea mortalităţii premature este influenţată de interesele ştiinţifice şi actuariale existente sau de obiectivele prestabilite.

Cuvinte cheie: *mortalitate prematură, APVP, disparitate de viaţă, prag de vârstă*

Преждевременная смертность – очень сложное понятие, и, хотя оно широко изучается в специальной литературе, единого взгляда по его определению нет. Целью данного исследования является сравнение двух различных моделей анализа преждевременной смертности, чтобы выделить наиболее подходящую для национального контекста. Актуальность данного исследования определяется уровнем смертности, наблюдаемым в Республике Молдова, и, в частности, вопросом уровня смертности взрослых мужчин. Для реализации этой цели сравнивались следующие показатели: доля смертей до определенного возрастного порога, Потерянные Годы Потенциальной Жизни (ПГПЖ), потери продолжительности жизни из-за преждевременной смерти и возрастной порог, полученный из данного показателя. Анализ проводился в сравнительном аспекте. С этой целью в исследовании были проанализированы данные по Чехии и Швейцарии. В случае с Республикой Молдова, довольно сложно определить общепринятый и единственный набор показателей, который позволил бы осуществлять мониторинг преждевременной смертности. «Классические» показатели подвержены воздействию возрастной и численной структуры населения. Показатели «динамического» подхода освобождены от влияния возрастной и численной структуры населения, но имеют более сложную методологию и более сложны для интерпретации. Однако создание и продвижение набора показателей для мониторинга преждевременной смертности, несомненно, необходимо. Важно отметить, что на выбор показателей для мониторинга преждевременной смертности влияют существующие научные или актуарные интересы или поставленные цели.

Ключевые слова: *преждевременная смертность, ПГПЖ, потери продолжительности жизни из-за преждевременной смерти, возрастной порог*

INTRODUCTION

Mortality is a basic demographic process, but at the same time, it is also a process with a high socioeconomic impact. Every death is an irreparable loss with substantial implications at a personal and societal level, but premature deaths usually create more profound and complex consequences.

The Republic of Moldova is characterised by the mortality pattern specific to East European countries. It is distinguished by the high-level mortality of the adult population, especially in the case of males, which determines the stagnation of life expectancy levels and maintenance of the deep gender gap. In this regard, premature mortality becomes one of the more critical aspects of mortality analysis because it allows us to focus on the exact group and analyse it exclusively to understand and react/intervene in the specific population segment.

Even though premature mortality is a subject of great importance and is widely studied in the specialised literature, there is no broad agreement on its definition. This study aims to compare two different methods of analysis of premature mortality – the classic and the dynamic one – and to present which is the best and most efficient in research and evidence of premature mortality. The actuality of this study is determined by the mortality level observed in the Republic of Moldova and particularly by the issue of adult male mortality level.

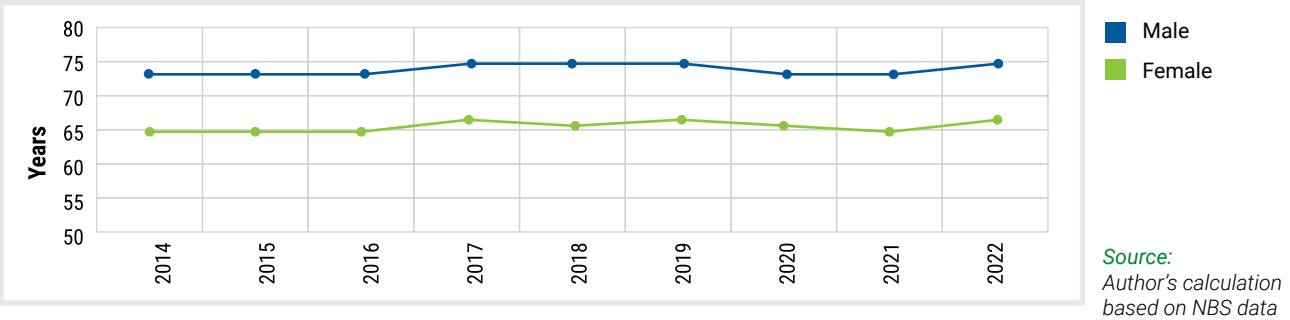
Premature mortality is an essential tool for analysing the population's health level and the health system as a whole. The earlier deaths suggest the existence of more health problems in the population, but also some intervention deficiency or inadequate preparation of the health system to respond to the existing issues. Also, premature mortality is highly linked to the quality of primary care. Studies in the field highlighted that proper and qualitative primary care can help avoid and reduce premature mortality (Or, 2001; Nolte, Scholz, & McKee, 2004; Plümper, Laroze, & Neumayer, 2018).

BACKGROUND

In the period 2014-2022, the evolution of life expectancy at birth followed a similar trajectory for both sexes (Fig. 1). The period 2014-2017 was characterised by a clear upward trend in life expectancy at birth for both sexes, followed by a period - 2018-2019 - of stagnation in the case of women and fluctuations in the case of men. The Covid-19 pandemic strongly marked the period 2019-2021. However, the reductions in life expectancy at birth observed for both sexes overturned the general and stable tendency of evolution observed earlier. Nevertheless, 2022 is characterised by a compensatory rebound in life expectancy at birth for both sexes.

It is essential to mention that gap between sexes remained constant throughout the analysed period.

Figure 1.
Life expectancy at birth by sexes, 2014-2022



Source:
Author's calculation based on NBS data

Despite the recent trend of increasing life expectancy at birth, the Republic of Moldova remains one of the countries with the lowest values of this indicator in the European region (Penina, 2022). In the case of the Republic of Moldova, the results are much more modest due to high premature mortality, especially among men. The issue of adult population mortality, mainly male mortality, is a characteristic pattern in the ex-Soviet Eastern European space (Penina, 2022; Kuznetsova, 2021; Grigoriev, et al., 2020). However, the life expectancy at birth indicator is composite, presenting more of an overall average of the mortality situation, which can mask certain specific features (Andreev, 2021). In this context, premature mortality becomes a very effective tool in analysing the mortality situation, focusing research attention on a specific population group, namely the group with the highest potential for development and productivity.

LITERATURE REVIEW

The concept of premature mortality is very complex, with a high interrelation with all life aspects – health, social, and economic. Premature mortality is extensively researched in the field literature (Committee on Population; National Research Council, 2015). For the first time, Dempsey introduced the concept in the second half of the '40s (Dempsey, 1947). After that, the concept of premature mortality was developed, and different aspects were analysed. However, a broad agreement on it does not exist. Premature mortality represents the total number of deaths that take part up to one age threshold, or in other words, are all untimely deaths. So, the main debates are around the age at which one death could be considered premature or normal/late. It is necessary to highlight that in this research, we will focus mainly on two distinct approaches – the classical and dynamic ones.

The classical approach is supposed to have a stable age threshold set by the researcher. However, the dynamic approach uses the dynamic age threshold, determined by the evolution of general mortality. Mazzuco and colleagues compared two approaches and presented a different one through a combination of the first two (Mazzuco, Suhrcke, & Zanotto, 2021). Although specific methodological approaches regarding premature mortality analysis can be outlined in general terms, there is still no consensus on the age threshold, even within the same approach. So, in the research from the field, different ages were used as the exact age threshold – 65 (French National Institute for Statistic and Economic Studies, 2023; Eurostat, 2002; Eames, Benshlomo, & Marmot, 1993), 70 (OECD, 2011), 75 years (Wong, Shapiro, Boscardin, & Ettner, 2002).

The second approach is focused on linking premature mortality with the evolution of general mortality (Ray, 2017; Vaupel, Zhang, & van Raalte, 2011). Ray mentioned that premature mortality is unattained life expectancy (Ray, 2017). So, he states directly the link between premature mortality and the evolution of general mortality. In this case, the general idea is that one death could be considered premature or not regarding the general level of mortality. Therefore, in one case, the same age of death could be considered premature, while in another, a "late" one. Other researchers link premature mortality with inequality in lifespan (Shkolnikov, Andreev, Zhang, Oeppen, & Vaupel, 2011; Vaupel, Zhang, & van Raalte, 2011). This approach allows us to highlight the link between health, inequalities and mortality. In their research, Shkolnikov and colleagues analysed lifespan inequality through the lifespan disparity indicator and mentioned that lifespan disparity represented the lost life years due to death (Shkolnikov, Andreev, Zhang, Oeppen, & Vaupel, 2011). Vaupel and colleagues analysed the link between lifespan disparity and life expectancy at birth. They highlight the age at which death could be considered premature in light of lifespan disparity. Also, they stated that a reduction in mortality up to this age could reduce lifespan disparity and increase life expectancy at birth (Vaupel, Zhang, & van Raalte, 2011).

The subject of premature mortality is studied from different perspectives at the international level, but last time, the subject started to be more studied at the national level as well. In this research, we will focus on the methodological part of this issue, which will be analysed through the national studies and documents that treat the subject of premature mortality in this light.

At the national level, the importance of premature mortality is reflected in the National Program for the Prevention and Control of Non-Communicable Diseases. This program analyses premature mortality in the context of non-communicable diseases, focusing on specific causes of death. Additionally, the age group representing the target of the premature mortality concept is highlighted, which is 30-69 years old (Ministry of Health, 2022). In a broader context, premature mortality goes beyond this age group and requires a set of specific indicators that would allow monitoring the evolution of life expectancy at birth. Also, most studies that analyse premature mortality in the national context use a classical approach with some exact age thresholds stated by researchers (Pahomii, 2018; Raevschi, 2017; Penina & Raevschi, 2017). In the national studies, the age threshold of 65 (Pahomii, 2018) and 70 (Penina & Raevschi, 2017; Raevschi, 2017) are more often used.

DATA SOURCES AND METHODS

This research is based on the data available on the National Bureau of Statistics (NBS) database. In order to perform the proposed analysis, the mortality and exposure population data were retrieved from the NBS database. The used mortality data are represented by the number of deaths by age and sex. The exposure population is available with an open interval of 85+ years. Because of that, our analysis used that open-age interval.

In this research, the classical as well as the dynamic approach was applied in the analysis of premature mortality.

In order to achieve the proposed objectives, life expectancy at birth, the proportion of deaths, PYLL (Potential Years of Life Lost) by the specific ages, lifespan disparity and age threshold derived from the lifespan disparity were calculated. Life expectancy at birth was calculated to present the general situation on mortality. The share of premature mortality, PYLL up to specific age, lifespan disparity and age threshold derived from lifespan disparity were calculated to assess the level of premature mortality.

The share of premature mortality was calculated up to 65, 70 and 75 years, and these ages also were used as age thresholds for PYLL calculation. These ages are most often used in research on premature mortality in the field. The OECD materials define PYLL as "a summary of premature mortality" (OECD, 2023). The calculation principle is straightforward; it involves summing up deaths occurring at each age and multiplying this with the remaining years to live up to a selected age threshold.

Lifespan disparity ($e^{\dagger}$ - *e-dagger*) is the measure of lifespan variation, and it is defined as the average remaining life expectancy when death occurs or life expectancy/life years lost due to death (Vaupel & Romo, 2003; Shkolnikov, Andreev, Zhang, Oeppen, & Vaupel, 2011). It weights the average remaining life expectancy at age x by the number of life table deaths at age *x* (Kibele, 2012).

The discrete form of this is expressed as follows:

$$e^{\dagger} = \sum_{y=0}^{\omega-1} d_{\alpha} \bar{e}_{\alpha} \quad (1.1)$$

Where,
ω- is the highest age group, in our case, 110 years;
ē - is the average remaining life expectancy;
α- age.

The age threshold derived from $e^{\dagger}$ was calculated in the base of the formula proposed by Zhang and Vaupel (Zhang & Vaupel, 2009) So, the age threshold can be identified based on the following relationship:

$$e^{\dagger} = e(a) * (1-H(a)) \quad (1.2)$$

Where,
$H(a)$ – cumulative hazard to the age a;
a – age.

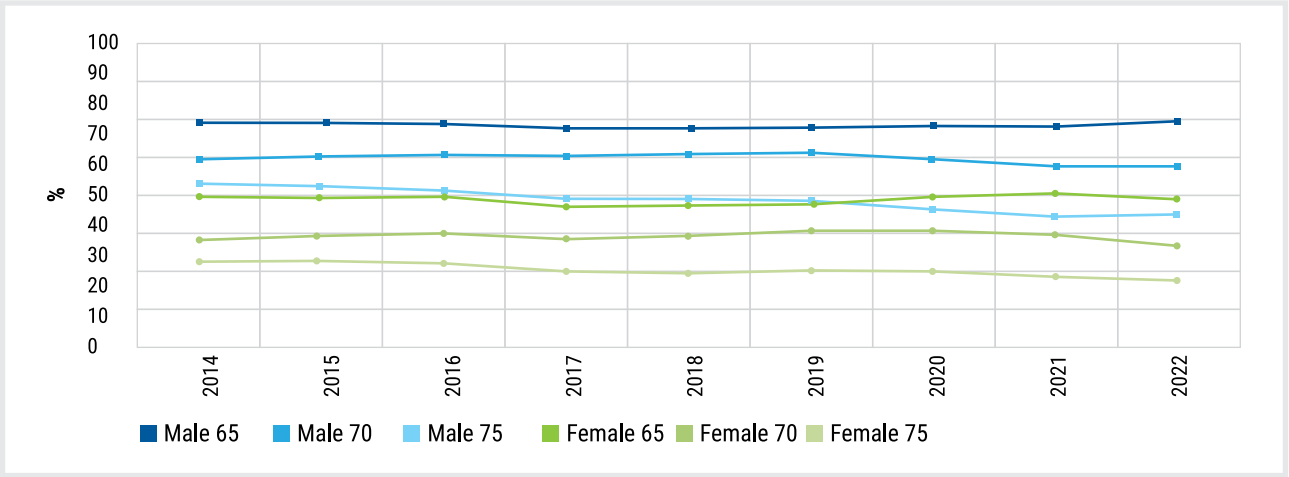
Data used in the analysis include the period 2014-2022. The analysis refers to this period in order to avoid issues caused by the quality of data. The data starts with 2014 and refers to the population with stable residence. Thus, long-term migrants are excluded from the population, which allows us to avoid the problem of overestimating the number of the population.

MAIN RESULTS

In the context of this research, various age thresholds, considered classical in premature mortality analysis, were analysed. The analysis of the proportion of deaths before specific age thresholds clearly shows existing disparities between sexes (*Fig. 2*). During the analysed period, the differences between sexes ranged between 20 and approximately 30 percentage points. Additionally, between 2014 and 2022, there was an observed reduction in the proportion of premature mortality for the age threshold of 65 years. Specifically, the proportion of deaths before the age of 65 decreased by 10.3% for men and 6.4% for women during this period, resulting in 43.5% for men and 21.6% for women in 2022. The proportion of deaths before 70 and 75 remained essentially constant for both sexes. Although there seemed to be a slight decrease in the proportion of deaths before 75 in the case of women, this trend was disrupted during the pandemic.

However, in 2022, specific signs, although still not significant, indicate a reduction in the proportion of deaths before 75, suggesting a potential return to the decreasing trend observed earlier. For men, the proportion of deaths before the age of 70 remained practically constant throughout the analysed period, and there was even a slight increase in the proportion of deaths before the age of 75 in 2022. It is essential to mention that the impact of the pandemic is less reflected in the observed data for men than women based on this indicator.

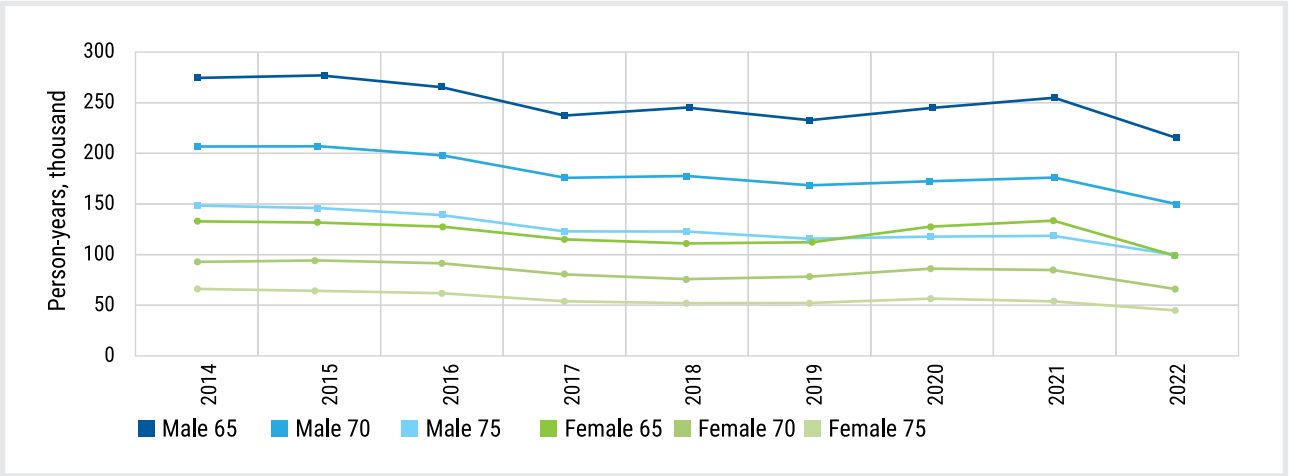
Figure 2.
Share of deaths at specific ages by sex, %



Source: Author's calculation

The PYLL (Potential Years of Life Lost) indicator analysis presents the evolution of premature mortality through potential years of life lost. PYLL was also calculated based on three age thresholds to capture the differences they determined. The evolution of PYLL for all analysed age thresholds clearly shows a decreasing trend in premature mortality until 2019 (Fig. 3), followed by an increase in premature mortality during the pandemic from 2019 to 2021 and a compensatory decrease observed in 2022. Disparities between sexes remained practically at the same level throughout the analysed period, and this situation applies to all age thresholds. Additionally, it is necessary to highlight that the evolution of the PYLL indicator is much more consistent for women. In contrast, fluctuations were observed for men even during the pre-pandemic period.

Figure 3.
PYLL at specific ages by sex, person-years, thousands



Source: Author's calculation

Lifespan inequality is a relatively new method of analysing premature mortality, focusing more on the disparities in the observed lifespan within a population. The evolution of lifespan inequality has shown a fluctuating pattern for both sexes (Fig. 4). It is essential to mention that the indicator evolved differently for both sexes, with the pre-pandemic period until 2019 and the period from 2019 to be highlighted separately.

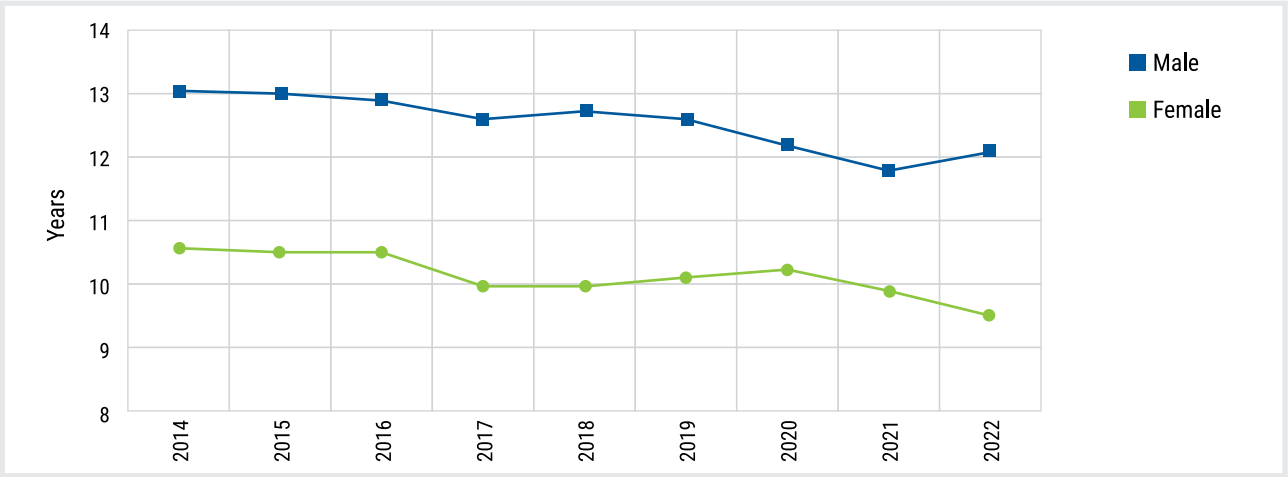
A slow but constant indicator reduction is observed for males until 2018. Subsequently, the reductions continue during the pandemic, intensifying in 2021. This suggests that the inequalities in the age of death for men have continuously decreased, but the reasons for these reductions will be addressed later. In 2022, an increase in the indicator was noticed for men. Overall, over nine years, inequalities between men decreased by 0.9 years.

For females, the period from 2014 to 2016 is characterised by stagnation. Inequalities in the age of death for women caused a loss of 10.6-10.5 years during this period. However, in 2015, a reduction of 0.5 years was observed, reaching ten years, and the reduction continued at a much slower pace the following year, only 0.1 years. The pandemic and post-pandemic periods determine the significant differences between the sexes. While reductions continued for men, a rise in inequalities was observed for women, leading to an increase in the indicator. However, this increase was observed only for 2019-2020, after which the reduction trend and return to the previous trend continued. In 2022, the lifespan disparity for women was 9.5 years, with a reduction of 1.1 years in the indicator compared to 2014.

Disparities between sexes remained practically identical during the analysed period. At the beginning of the reference period, the differences between men and women were 2.4 years, reaching a maximum of 2.7 years in 2018 due to antagonistic trends observed for both sexes in that year. The minimum values were observed in 2020-2021, with a difference of 1.9 years. By the end of the analysed period, disparities between sexes were 2.6 years.

Figure 4.

Lifespan inequality measured by e†, by sex, years

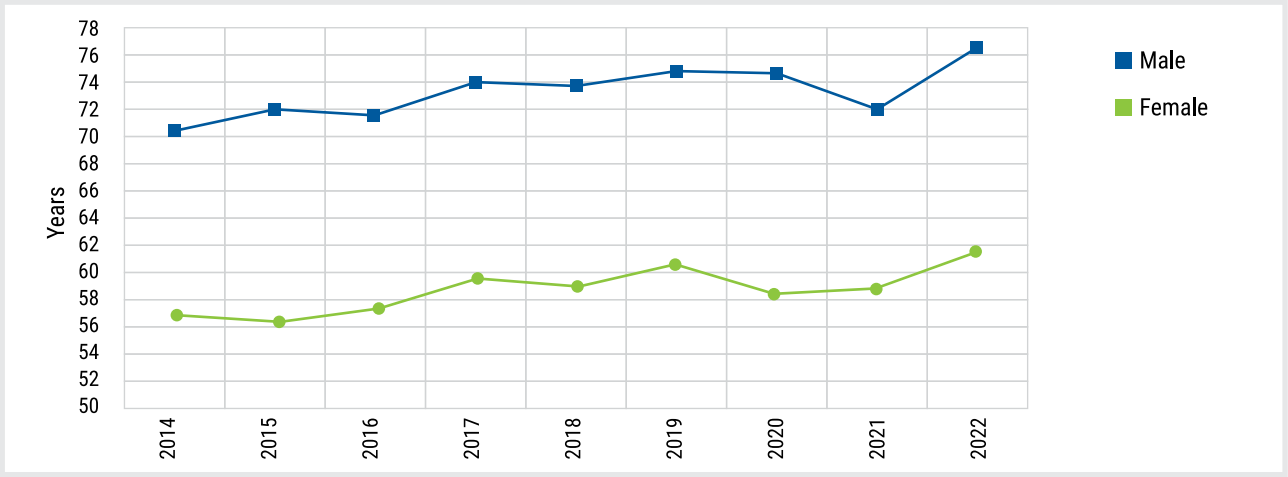


Source: Author's calculation

Lifespan disparity could be reduced, but to decrease the differences in life duration and age at death, mortality must be reduced for specific age groups. Thus, the age threshold derived from $e^{\dagger}$ indicates the age until mortality reduction positively impacts reducing the variation in age at death. In other words, this age threshold separates "early" from "late" deaths. Therefore, we can conclude that this age is, in fact, the age threshold for premature deaths.

Figure 5.

Age-threshold derived from $e^{\dagger}$ - $a^{\dagger}$, by sex, years



Source: Author's calculation

Because this indicator is derived from $e^{\dagger}$, it defines different age thresholds for males and females. One of the alarming factors is the increasing disparities between sexes during the analysed period (*Fig. 5*). In 2014, the disparities between sexes were 13.4 years, and at the end of the analysed period, they reached 14.9 years. The highest difference between sexes was observed in 2020 when the female age threshold was 16.1 years higher compared to males. In 2014, females started with values of 70.2 years for the age threshold, and this threshold increased by 6.3 years by the end of the analysed period, reaching 76.5 years. The age threshold registered for males at the beginning of the observed period was 56.8 years, and it increased by only 4.7 years until 2022, reaching 61.6 years. For both sexes, a decrease in the age threshold was noticed during the pandemic period. The reduction was more pronounced for females, reaching the reduction peak in 2021, and a compensatory increase was observed in 2022. Similarly, for males, a compensatory increase was observed in 2022, the beginning of which was noticed as early as 2021.

DISCUSIONS

The classic and dynamic approaches have its strengths and weaknesses. Thus, one of the classic approach's main strengths is its transparent methodology and replicability due to methodological simplicity. However, the indicators used in this research also have certain limitations.

The population's age structure heavily influences the indicator of the proportion of deaths up to a certain age. Therefore, these indicator is straightforward to interpret but can introduce significant errors, especially for comparing different populations or periods. Moreover, the analysis demonstrated how much the chosen age threshold influences this indicator. PYLL is another indicator exposed to the influence of population structure and size, but standardisation procedures can reduce this impact. PYLL can be considered an indicator with a higher level of credibility, which also allows for international comparisons, as it is used by several international organisations (OECD, 2023; Eurostat, 2002). Thus, if the issue of errors induced by population size and structure for this indicator can be eliminated, another aspect and topic of discussion remain – how the age threshold is chosen. Methodologically speaking, there is no clear solution; the age threshold is often selected depending on the research interest (Mingot, Rué, & Borrell, 1991; Wise, Livengood, Berkelman, & Goodman, 1988). While there is typically a reference to the evolution of overall mortality levels, it is not mandatory to adhere to it. One solution is adopting the age threshold promoted by international organisations, but in this case, we must ensure its usefulness and accurate reporting concerning national realities. We must consider the relatively high level of premature mortality in males and the significant discrepancies caused by this between sexes.

Lifespan disparity helps identify and highlight health disparities within a population. This indicator is more complex to analyse comparatively between different populations and has a more complex methodology than indicators from the classic approach. However, lifespan disparity allows for capturing the connection between mortality and health. It is important to note that premature mortality results from inequality in opportunities for better health or healthcare services. A high variation in the age of death indicates that the average does not characterise most of the population. Similarly, age thresholds derived from lifespan disparity allow for establishing the threshold at which deaths can be considered premature or "late" (ZhangF & Vaupel, 2009). It is essential to mention that reducing mortality before this age also reduces lifespan disparity, while reducing mortality after this age increases lifespan disparity.

Each approach is valid, and each set of indicators can be applied depending on the research interest. For international monitoring and comparability, the classic approach is more practical and is accepted and used by several international organisations. In scientific terms, the dynamic approach is more effective as it proposes methodologically justified solutions. However, results obtained through the dynamic approach are more complex to interpret compared to the classic approach. For this reason, a clear purpose and approach must exist in analysing premature mortality to create and promote an efficient scientific framework with a high degree of applicability and utility.

CONCLUSIONS

The analysis of the indicators has shown that regardless of the method of analysis considered, the differences between sexes remain very pronounced. Thus, the premature mortality rate among males is 1.5-2 times higher than among females. At the same time, there is a decreasing tendency of premature mortality in

both sexes. Indeed, the trend in premature mortality fluctuates and is relatively slow, but the overall trend is toward reduction. The impact of the Covid-19 pandemic is undeniable and has been recorded for each of the utilised indicators.

In the case of the Republic of Moldova, it is quite complex to identify a universally accepted set of indicators that would allow for the monitoring of premature mortality. However, establishing and promoting such a set of indicators is unquestionably necessary. This fact is primarily determined by the relatively high level of premature mortality, especially among males. Additionally, the choice of indicators for monitoring premature mortality is influenced by existing arguments or the goals set in the initial stages. Suppose the Republic of Moldova aims to create a framework that could be reported and integrated into the international statistical system or international statistical/informational bodies. In that case, these indicators must align with the options these organisations promote. In this case, most international bodies operate with PYLL to analyse and monitor premature mortality.

If the goal is to examine the evolution of premature mortality at the national level while promoting targeted actions and policies, then indicators from a dynamic approach are more valuable. These indicators outline the situation regarding premature mortality and highlight the existence of inequalities in terms of mortality. Moreover, identifying an age up to which reducing mortality allows for the reduction of inequalities in the population is extremely valuable. In this scenario, the efforts and actions of all stakeholders can be focused on specific population groups, enabling the maximisation of efforts' effectiveness and an increase in equity in terms of population health.

REFERENCES

Andreev, E. (2021). Is life expectancy at birth really the best measure of a population's mortality rate? Demograficheskoye obozreniye, 8(2), 6-26.

Committee on Population; National Research Council. (2015). Data Sources and Methodology in the Study of Premature Mortality. Measuring the Risks and Causes of Premature Death: Summary of Workshops (pp. 7-26). Washington: National Academies Press.

Dempsey, M. (1947). Decline in tuberculosis; the death rate fails to tell the entire story. American review of tuberculosis, 56(2), 157-164. PMID: 20264378. https://doi.org/10.1164/art.1947.56.2.157

Eames, M., Ben-shlomo, Y., & Marmot, M. (1993). Social deprivation and premature mortality: regional comparison across England. British Medical Journal, 307(6912), 1097-1102. https://doi.org/10.1136/bmj.307.6912.1097

Eurostat. (2002). Atlas on mortality in the European Union - Chapter 4: Premature mortality. (pp. 23-25). Luxembourg: European Communities. Retrieved from: https://ec.europa.eu/eurostat/web/products-statistical-books/-/ks-08-02-004

French National Institute for Statistic and Economic Studies (INSEE). (2023, February 1). Definition, methods and quality. Definition. Retrieved from French National Institute for Statistic and Economic studies: https://www.insee.fr/en/metadonnees/definition/c2232

Grigoriev, P., Jasilionis, D., Klusener, S., Timonin, S., Andreev, E., Mesle, F., & Vallin, J. (2020). Spatial patterns of male alcohol-related mortality in Belarus, Lithuania, Poland and Russia. Drug and alcohol review, 39(7), 835-845. https://doi.org/10.1111/dar.13037

Kibele, E. (2012). Mortality Differentials Across Germany's Federal States. Regional Mortality Differences in Germany (pp. 47-90). Dordrecht: Springer Science & Business Media. https://doi.org/10.1007/978-94-007-4432-5

Kuznetsova, P. (2021). Prezhdevremennaya muzhskaya smertnost' i ekonomicheskoye blagosostoyaniye domokhozyaystv. Demograficheskoye obozreniye, 8(3), 96-123. https://doi.org/10.17323/demreview.v8i3.13268

Mazzuco, S., Suhrcke, M., & Zanotto, L. (2021). How to measure premature mortality? A proposal combining "relative" and "absolute" approaches. Population health metrics, 19, 1-14. https://doi.org/10.1186/s12963-021-00267-y

Mingot, M., Rué, M., & Borrell, C. (1991). Years of potential life lost: Comparison of 3 calculation methods. Gaceta Sanitaria, 5(22), 21-28.

Ministry of Health. (2022). Documents: Particip.gov.md. Retrieved from Particip.gov.md: https://particip.gov.md/ro/document/stages/hg-cu-privire-la-aprobarea-programului-national-de-prevenire-si-control-al-bolilor-netransmisibile-prioritare-in-republica-moldova-pentru-anii-2022-2030-si-planul-de-actiuni-pentru-anii-2022-2025-pentru-implement

Nolte, E., Scholz, R. D., & McKee, M. (2004). Progress in health care, progress in health?: Patterns of amenable mortality in Central and Eastern Europe before and after political transition. Demographic research, 2, 139-162. https://doi.org/10.4054/DemRes.2004.S2.6

OECD. (2011). Premature mortality. In Health at a Glance 2011: OECD Indicators (p. 204). Paris: OECD Publishing. https://doi.org/10.1787/health_glance-2011-en

OECD. (2023, August). Data. OECD. Retrieved from OECD web site: https://data.oecd.org/healthstat/potential-years-of-life-lost.htm

Or, Z. (2001). Exploring the effects of health care on mortality across OECD countries. Paris: OECD. https://doi.org/10.1787/18151981

Pahomii, I. (2018). Dinamica mortalităţii premature în ultimele doua decenii: studiu comparativ Republica Moldova-Estonia. In Creşterea economică în condiţiile globalizării: competitivitate, inovativitate, sustenabilitate. Sesiunea ştiinţifică: "Transformări demografice şi priorităţi de politici" : conferinţa internaţională ştiinţifico-practică, ediţia a XIII-a, 11-12 octombrie 2018, Chişinău (pp. 44-56). http://dspace.ince.md/jspui/bitstream/123456789/1474/1/DINAMICA_MORTALITATI_%20PREMATURE_IN_ULTIMELE_DOUA_DECENII.pdf

Penina, O. (2022). Regional mortality disparities in the Republic of Moldova. Chisinau: Centrul editorial-poligrafic (CEP) Medicina. https://library.usmf.md/sites/default/files/2022-04/Regional%20mortality%20disparities%20in%20the%20Republic%20of%20Moldova.pdf

Penina, O., & Raevschi, E. (2017). Assessing age-and cause-specific risk groups of premature mortality in the Republic of Moldova. Бюллетень Национального научно-исследовательского института общественного здоровья имени Н.А. Семашко, 1, 220-224 http://bulleten-nriph.ru/journal/article/view/1733/5191

Plümper, T., Laroze, D., & Neumayer, E. (2018). Regional inequalities in premature mortality in Great Britain. PLoS One, 13(2). e0193488. https://doi.org/10.1371/journal.pone.0193488

Raevschi, E. M. (2017). Overview of evolution of premature mortality from major cardiovascular diseases in the Republic of Moldova 2003-2015. The Moldovan Medical Journal, 60(3), 46-49. https://moldmedjournal.md/wp-content/uploads/2018/10/moldmedjournal-2017-603-raevschi-full-article.pdf

Ray, J. (2017). Reducing premature mortality among young and middle-aged adults. Health Promotion and Chronic Disease Prevention in Canada, 37(3), 65-67. https://doi.org/10.24095/hpcdp.37.3.01

Shkolnikov, V., Andreev, E., Zhang, Z., Oeppen, J., & Vaupel, J. (2011). Losses of expected lifetime in the United States and other developed countries: methods and empirical analyses. Demography, 48(1), 211-239. https://doi.org/10.1007/s13524-011-0015-6

Vaupel, J., & Romo, V. (2003). Decomposing change in life expectancy: A bouquet of formulas in honor of Nathan Keyfitz's 90th birthday. Demography, 40, 201-2016. https://doi.org/10.1353/dem.2003.0018

Vaupel, J., Zhang, Z., & van Raalte, A. (2011). Life expectancy and disparity: an international comparison of life table data. BMJ open, 1(1), e000128. https://doi.org/10.1136/bmjopen-2011-000128

Wise, R. P., Livengood, J. R., Berkelman, R. L., & Goodman, R. A. (1988). Methodological alternatives for measuring premature mortality. American Journal of Preventive Medicine, 4(5), 268-273. https://doi.org/10.1016/S0749-3797(18)31160-7

Wong, M., Shapiro, M., Boscardin, W., & Ettner, S. (2002). Contribution of major diseases to disparities in mortality. New England Journal of Medicine, 347(20), 1585-1592. https://doi.org/10.1056/NEJMsa012979

Zhang, Z., & Vaupel, J. (2009). The age separating early deaths from late deaths. Demographic Research, 20, 721-730. https://doi.org/10.4054/DemRes.2009.20.29

INTERGENERATIONAL CHILDCARE SUPPORT TRANSFER: INSIGHTS FROM THE GENERATION AND GENDER SURVEY

DOI: https://doi.org/10.36004/nier.es.2023.1-05
JEL classification: D64, K38, D18
UDC: 316.356.2(478)

Mariana BUCIUCEANU-VRABIE,
PhD in sociology,
National Institute for Economic Research,
Academy of Economic Studies of Moldova

https://orcid.org/0000-0002-7743-7206
e-mail: buciuceanuvrabie@gmail.com

Ecaterina GRIGORAȘ,
PhD in sociology,
National Institute for Economic Research,
Academy of Economic Studies of Moldova

https://orcid.org/0000-0002-5607-5322
e-mail: ecaterina.grigoras@ince.md

Received 22 February 2023
Accepted for publication 27 June 2023

ACKNOWLEDGEMENTS

The study was carried out within the project 20.80009. 0807.21 ”Migration, demographic changes and situation stabilization policies”, 2020-2023.

ABSTRACT

Understanding intergenerational transfers of childcare is crucial in the context of declining birth rates, changing family structures, and population aging. Informal assistance in childcare is highly significant for many families with young children as it helps them balance their professional and parenting responsibilities. Existing research indicates that support provided by parents to their adult children in childcare positively impacts decisions regarding childbirth and women's participation in the labor market.

The aim of this study is to analyze patterns of support transfer between different generations and identify factors influencing intergenerational transfers in Moldova. It is based on data from the "Generations and Gender" (GGS) study conducted in 2020. Thanks to its representative sample, the study encompasses aspects such as intergenerational transfers related to childcare and grandchildren, attitudes toward childcare, and socio-demographic variables. Statistical analysis involves cross-tabulations and logistic regressions to identify factors determining participation/transmission of support in childcare.

The research findings demonstrate that grandparents provide significant assistance to their adult children in childcare, particularly during the initial years of the child's life. This support is predominantly received by women with young children and women with higher education with children. Typically, childcare assistance is offered by grandparents approaching pre-retirement and retirement ages. Factors such as children's ages, family size, level of education, and urban residence significantly influence the receipt of childcare assistance. The results underscore the importance of traditional values and societal expectations, providing a nuanced understanding of intergenerational relationships amidst a changing demographic landscape. They could prove valuable for policymakers and developers of programs supporting families with children.

Keywords: *intergenerational transfers, childcare support, Moldova*

Înţelegerea transferurilor intergeneraţionale pentru îngrijirea copiilor are o importanţă deosebită în contextul reducerii ratei fertilităţii, schimbării structurii familiale şi îmbătrânirii populaţiei. Asistenţa informală pentru îngrijirea copiilor este extrem de valoroasă pentru multe familii cu copii mici, ajutându-le să îmbine responsabilităţile lor profesionale şi cele parentale. Studiile existente arată că ajutorul pe care părinţii îl oferă copiilor lor adulţi în îngrijirea copiilor are un impact pozitiv asupra deciziilor legate de naşterea copiilor şi participarea femeilor pe piaţa muncii. Scopul acestui studiu este de a analiza modelele transferului de sprijin între diferite generaţii şi de a identifica factorii care influenţează transferurile intergeneraţionale în Moldova. Acesta se bazează pe datele studiului „Generaţii şi Gen” (GGS), efectuat în 2020. Datorită eşantionului reprezentativ, studiul include aspecte precum transferurile intergeneraţionale în îngrijirea copiilor şi nepoţilor, atitudinea faţă de îngrijirea copiilor şi variabilele socio-demografice. Analiza statistică implică tabele încrucişate şi regresii logistice pentru a identifica factorii care determină implicarea/transferul de sprijin în îngrijirea copiilor.

Rezultatele studiului au arătat că bunicii oferă un sprijin semnificativ copiilor lor adulţi în îngrijirea copiilor, în special în primii ani de viaţă a acestora. De regulă, acest sprijin este acordat femeilor cu copii mici şi femeilor cu studii superioare care au copii. De regulă, asistenţa în îngrijirea copiilor este oferită de bunicii aflaţi înainte de vârsta de pensionare şi de cei pensionaţi. Factori precum vârsta copiilor, dimensiunea familiei, nivelul de educaţie şi locuirea în mediu urban influenţează semnificativ primirea asistenţei pentru îngrijirea copiilor. Rezultatele subliniază importanţa valorilor tradiţionale şi a aşteptărilor sociale, oferind o înţelegere subtilă a relaţiilor dintre generaţii în contextul unei situaţii demografice în schimbare şi ar putea fi utile pentru elaboratorii de politici şi programe de susţinere a familiilor cu copii.

Cuvinte cheie: *transferuri intergeneraționale, îngrijirea copiilor, Moldova*

Понимание межпоколенных трансфертов по уходу за детьми имеет важное значение в контексте снижения рождаемости, изменения семейной структуры и старения населения. Неформальная помощь по уходу за детьми является очень важной для многих семей с маленькими детьми, помогает им совмещать свои профессиональные и родительские обязанности. Существующие исследования показывают, что помощь, оказываемая родителями своим взрослым детям по уходу за детьми, положительное влияет на решения о рождении детей и участии женщин на рынке труда. Целью данного исследования является анализ закономерностей передачи поддержки между разными поколениями и выявление факторов, влияющих на межпоколенные трансферты в Молдове. Оно основывается на данных исследования «Поколения и Гендер» (GGS), проведенного в 2020 году. Благодаря репрезентативной выборке исследование включают такие аспекты, как межпоколенные трансферты по уходу за детьми и внуками, отношение к уходу за детьми и социально-демографические переменные. Статистический анализ включает перекрестные таблицы и логистические регрессии для выявления факторов, определяющих участие/передачу поддержки по уходу за детьми.

Результаты исследования показали, что бабушки и дедушки оказывают значительную помощь свои взрослым детям по уходу за детьми, особенно в первые годы их жизни. Чаще всего такую поддержку получают женщины с маленькими детьми и женщины с высшим образованием, имеющие детей. Как правило, помощь по уходу за детьми оказывают бабушки и дедушки предпенсионного и пенсионного возраста. Такие факторы, как возраст детей, размер семьи, уровень образования и проживание в городской среде, существенно влияют на получение помощи по уходу за детьми. Результаты подчеркивают важность традиционных ценностей и общественных ожиданий, обеспечивая тонкое понимание отношений между поколениями в условиях меняющейся демографической ситуации, и могут оказаться полезными для разработчиков политики и программ поддержки семей с детьми.

Ключевые слова: межпоколенческие трансферты, помощь по уходу за детьми, Молдова

INTRODUCTION

The dynamics of intergenerational relationships have gained significant attention in recent years, especially in the context of the imbalance between generations caused by the low birth rate, population aging and migration. Intergenerational relationships refer to the chain of relationships between parents, adult children, grandchildren, and even great-grandchildren. There is a certain reciprocity between each family member that benefits each generation. The intensity of these relationships, the mutual support, will change depending on the stage of life, the composition of the family (own and of parents), family relationships during childhood, attitudes related to intergenerational support, the socio-economic status of adult children and their parents. At the same time, these relationships are influenced by the level of socio-economic development of the country, urbanization, social policy and developed services, etc. As societies age and family structures evolve, understanding the nature and patterns of intergenerational help has become more important.

In Moldova, relations between parents and children have a strong traditional and emotional charge. The context of intergenerational support is reflected, albeit somewhat summarily and tangentially, in the Constitution of the Republic of Moldova through Article 48, which provides normatively for "the right and duty of parents to ensure the upbringing, education, and training of children", as well as the fact that "children are obligated to take care of their parents and provide them with assistance". Actors of intergenerational social networks take different roles in the exchange of private aid (transfers): either as beneficiaries/recipients (those who receive the aid), or as givers (those who provide/offer the aid), or both (both those who receive and those providing aid).

In the article, based on data from Generations and Gender Survey, we analyse one of the potentially most important domains that characterize the parent-adult offspring relationships - the support and assistance that is exchanged between them. The purpose of the study is to examine the extent of support for child care and the factors of intergenerational support. Informal childcare support is essential for many families with young children to help them fulfil their work and family responsibilities.

The subject of the analysis consists of respondents who have children under the age of 14, as well as respondents who provide assistance to them.

LITERATURE REVIEW

In recent decades, research into intergenerational relationships and transfers has garnered substantial attention in the scientific arena, particularly regarding financial, time, and support care transfers within the context of assistance provided in raising and educating children/grandchildren. Several empirical studies in the USA and Europe have delved into these complex dynamics, shedding light on various aspects of intergenerational transfers. Research consistently shows that intergenerational support flows primarily downward from old to young, or is balanced, but parents become net beneficiaries of help only at an advanced age (Albertini & Kohli, 2013; Kohli, 2004; Gierveld, Dykstra, & Schenk, 2012). Elderly parents often provide assistance in various areas, including household chores, financial support, child care, and emotional support (Ingersoll-Dayton, et.al., 2001).

Utilizing the GGS data, various types of intergenerational support were delineated, and a comparative analysis was conducted for Eastern and Western European countries (Gierveld, Dykstra, & Schenk, 2012). It was found that there is a greater likelihood of being involved in providing support to adult children than receiving support from them.

Linked to economic models of fertility decision-making, studies suggest that time transfers and availability

of grandparental childcare play a significant role in childbearing decisions of young adults (Eibich & Siedler, 2020). Addressing the demographic and socioeconomic implications of intergenerational transfers some papers are concluding on the relationship between the willingness of grandparents to provide childcare and the fertility and employment decisions of the second generation (Thomese & Liefbroer, 2013; García-Morán & Kuehn, 2017; Hank & Buber, 2009). It has been found that the proximity of parents and adult children also plays a role in intergenerational time transfers, affecting childcare support. So, in this context authors estimated that around 50 percent of grandparents in the U.S. and Europe provide some form of assistance with childcare. British and Australian studies have shown that between a quarter and a half of employed women have their children looked after by a grandmother while they are at work (Millward, 1998).

For grandparents, it is important to provide both financial and emotional support to their grandchildren. This reflects a desire to build strong bonds and ensure the well-being of younger generations (Pillemer, et al., 2007). There are studies that focus on intergenerational transfers of financial assistance to adult children, emphasizing income and wealth as the predominant determinants of such provisions (Albertini & Radl, 2012). Other studies present empirical arguments and evidence of cross-national variation concerning the relationship between family size, birth order, and intergenerational financial transfers in Europe (Emery, 2013).

In Romanian literature, it is shown that the primary beneficiaries of intergenerational support transfers are grandchildren that have grandparents under 70 years old and, to a lesser extent, elderly individuals over 70 years old. The relevance of interfamily support in the Romanian context is fueled by the traditional obligation to assist family members in need. Studies indicate that individuals with lower levels of education, greater religiosity, no professional activity, and who have grandchildren tend to feel a higher sense of responsibility towards family members in need (Mureşan, 2012).

The diversity in intergenerational transfers and its specifics in Moldova have received relatively less attention. The subject has been explored in works and studies that evaluate the challenges faced by families with children in reconciling professional and parental roles (Chistruga-Sînchevici, 2021). Some tangential reflections on the topic are presented in the study on the reproductive behavior of women in the Municipality of Chisinau, which reveals significant support from grandparents through financial assistance (54%) and support in raising and educating the first grandchild (65%). It was observed that the traditional family relationship model and mutual support remain relevant (Grigoraş, 2022). Several facets of intergenerational transfers have been elucidated through analytical studies conducted using the National Transfer Accounts and the estimation of financial transfers across generations (Gagauz & Prohnitski, 2022). Intergenerational support has been a subject of analysis, even in the context of the COVID-19 pandemic, with studies highlighting the various challenges faced by families, intergenerational support mechanisms during crises, and the vulnerability of their members (Gagauz et al 2021). The relationships between generations are explored in more detail in the Generations and Gender study conducted in 2020 (GGS, 2020). Initial analyses of the survey data have highlighted the presence of strong traditional bonds among family members of different ages and mutual support.

Overall, the specialized literature on intergenerational transfers is complex and encompasses a wide range of aspects related to the support and interactions among members of different generations within a family. The present study contributes to the body of research on the support transfers between generations by analysing particularities and determinants factors of intergenerational help and support especially given by adult parents to their adult children.

The use of data from Moldova, one of the countries in Eastern Europe facing both a declining birth rate and insufficiently developed childcare services for preschool children, is notable for exploring the factors influencing the receipt of childcare.

THE THEORETICAL FRAMEWORK

Several theoretical frameworks offer valuable insights into understanding the support received for childcare from elderly parents. The Intergenerational Solidarity Theory is instrumental in comprehending the reciprocal exchanges of support among different generations. This theory categorizes support into emotional, instrumental, and financial dimensions, emphasizing the delicate balance between giving and receiving support within families (Bengtson & Robert, 1991; Chisholm, 1999; Giarrusso & Putney, 2020).

Role theory emphasizes the challenges arising from the multiple roles that individuals assume within the family and society. It offers a lens to analyse the potential conflicts and stressors that stem from juggling caregiving responsibilities alongside other roles such as spouse, parent, mothers, fathers, sons, daughters, grandparents (Georgas, 2004).

Generativity theory, proposed by Erik Erikson, posits that middle-aged individuals experience a sense of generativity - a desire to contribute positively to younger

generations and leave a lasting legacy. Peterson (2002) elaborates on how this theory underlines the significance of caregiving as a means to fulfil generative needs.

Social exchange theory and role modelling are alternative theories of how the willingness to provide intergenerational assistance is transmitted from one generation to the next. Homans, Blau, and Emerson were the key theorists who developed the original theories of social exchange. Theoretical and empirical developments include the extension of their work to the analysis of power and dependence, social networks, reciprocity, fairness, social cohesion, and solidarity (Ribar & Wilhelm, 2006).

Many studies draw on stress and coping theories. These theories explore how caregivers experience stress and employ various coping strategies to manage their caregiving responsibilities (Ingersoll-Dayton, et al.,2001).

The key concept of this work is centred on the theory of intergenerational solidarity and the theory of roles. The intergenerational relationships arising from mutual support in the results of the GGS study are presented through private material transfers between parents and children, children and parents, friends, etc. Thus, four types of transfers are delineated: financial assistance; assistance in self-care (e.g., in performing hygiene procedures); assistance in child care provision; practical household help (such as housework, cooking, cleaning, laundry, minor repairs, etc.). In our article, the focus is on intergenerational transfers related to the support provided/received in the care and upbringing of children/grandchildren.

DATA SOURCES AND METHODS

The empirical basis of the current research consists of data from the Generations and Gender Study, one of the most comprehensive sociodemographic studies conducted for the first time in the Republic of Moldova in 2020 (GGS, 2020). The Generations and Gender Survey was administered to a sample of over 10000 respondents aged between 15-79 years, collecting information about the dynamics of people's lives and families in society and at the individual level. In numerous sections, intergenerational dialogue is assessed through a set of questions designed to reveal the intergenerational relationships and support provided and received by parents and their adult children.

In this article, our focus is particularly on evaluating intergenerational support in childcare, how childcare assistance received and provided varies and interacts with different socio-demographic indicators. This support is informal, meaning it is not a professional activity for the person providing it. For this analysis, the main variables indicating intergenerational support given and received in childcare for children/grandchildren were HHD18, "In the last 12 months, have you regularly received help in taking care of your child(ren) from relatives, friends, or other individuals who do not work in childcare?" and HHD25, "In the last 12 months, have you provided help to someone else in taking care of a child?" As filters for selecting first and second-degree relatives, questions HHD19, "Who has regularly helped you with childcare?" and HHD26 - 1, "Whom have you provided assistance to?" were used.

The analysis of GGS data includes two complementary components. The first component involves a descriptive analysis of the sociodemographic profile (gender, age, residence, level of education, occupational status) of the two selected categories of respondents extracted from the GGS study: *givers of non-formal childcare suppor*t, persons aged 15-79 years (N=1822) and recipients of childcare support, parents aged 15-59 years (N=454) whose children are up to 14 years old (*Appendix, Table 2*). Additionally, respondents' perceptions of the duty of parents/grandparents to take care of their children/ grandchildren were assessed (ATT05 a, c, "Should grandparents take care of grandchildren if parents cannot do so? / Should parents adapt their own lives to be able to help their adult children when they face difficulties?" (*Table 4*).

The second component is the inferential statistics based on binary logistic regression analysis conducted using the SPSS statistical package. The first regression model (*Table 5*), represented by question HHD19 (Regular help with childcare: People), includes the dependent variable equal to 1 – respondents who received help in taking care of children from parents and 0 – respondents who received help in taking care of children but not from parents in the last 12 months. Independent variables are age, sex, place of residence, education level, child age, partner presence, relationships with parents and household size. The logistic regression model on predictors of receiving childcare support from parents in the last 12 months shows that the independent variables (individual characteristics of respondents) explain 15% of the total variance of the dependent variable - *receiving permanent childcare support in the last 12 months* (Nagelkerke R-sq. is 0.157).

Table 6 contains the results on predictors of providing childcare support from grandparents in the last 12 months and reflects their sociodemographic characteristics. The dependent variable is the HHD25 question "Helped others with childcare?", where 0 - parents who gives help to their adult children, and 1- parents who gives help but not to their adult children. Independent variables are age, sex, place of residence,

household size, parents' age. The model is statistically significant and the independent variables included in the analysis explain 32% of the 1406 cases of giving support to care for grandchildren (Nagelkerke's R-sq. is 0.32).

The regression tables contain the coefficients and expressed values of the logistic regression model showing the probability (odds ratio) that the studied event will occur. The significance of the Wald statistic (under the column labelled Sig.) indicates the importance of the predictor variable in the model. The exponential beta column Exp (B) is the factor that changes the probability of having childcare/household help (odds ratio) when the independent variable increases by one. The odds ratio measures the association of two categorical variables, representing a proportion of two odds.

MAIN RESULTS

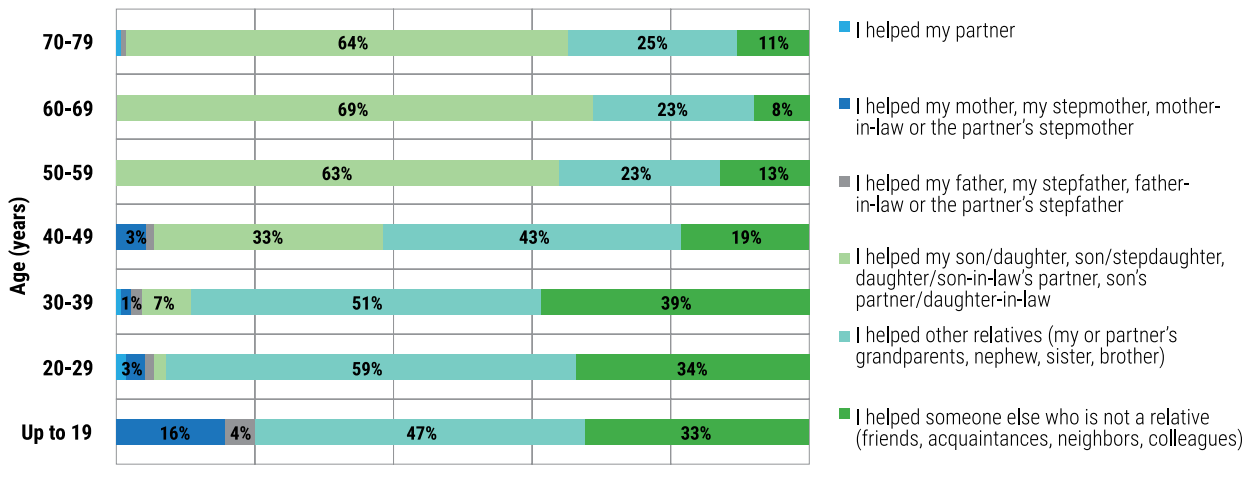
DESCRIPTIVE STATISTICS

According to research results over 18% of respondents aged 15-79 years were givers (donors) of help to another person in caring for their minor child/children (*Appendix, Table 1*). The structure of the sample (N=1822) according to the individual characteristics of the givers of non-formal support shows that: women constitute 68.9%, while men - about 31.1%; from rural areas are 51.7%, and urban 48.3% of which 24.6% are from Chisinau municipality (*Appendix, Table 2*). Donors with low and medium level of education have equal proportions of 41%, and those with higher level of education only 17.6%. The distribution by occupational status shows the high share of retired people 34.7% and employed - 30.1%, followed by unemployed people -10.1%, those on maternity or paternity leave/on parental leave or childcare leave 4.4% and others 20.6%.

Around 19% of the total respondents aged 15-59 years received permanent childcare support in the 12 months up to the survey (*Appendix, Table 1*). The particularities of the sub-group of beneficiaries of childcare support show that 73.6% are women, compared to men (26.4%); most of them are young people aged 30-39 (56.4%) and 20-29 (29.5%). 44.1% of the beneficiaries are from rural areas, almost one third from Chisinau municipality (28.9%) and 27.1% from urban areas. By occupational status most are employed (44.1%), on maternity or childcare leave 29.3%, not employed 10.4% and others 15.9%.

The age distribution and degree of kinship of those who helped someone with childcare illustrate significant differences. Up to the age of 40 respondents mainly help other relatives such as nephews, sister, brother but also non-relatives (neighbours, friends) and to an insignificant extent to partners. As people get older and raise their own children, social transfers change (*Figure 1*). From the age of 40-49, support for grandparents' care of grandchildren increases to 33%. Towards the pre-retirement and retirement ages - the share of people involved in childcare increases sharply. Thus, at the age of 60-69 years, 69% provide help in raising children, and after the age of 70 years - 64%. In the subsequent age groups following 40-49 years old, there is a noticeable decrease in the percentage of respondents who offer childcare support to other relatives as well as non-relatives.

Figure 1.
Distribution of childcare support givers by degree of kinship and age groups, % (N=1822)



Over 40% of recipients of childcare support reported support most often from their mother, stepmother, mother-in-law or partner's stepmother (*Table 3*). About 30% of respondents receive help from other relatives such as parents or parents-in-law, nephew, sister, brother. Support from their own father, stepfather, father-in-law or partner's stepfather receive 15.9% of respondents. Also worth mentioning is the support received from other non-relatives - 10.8% and from the partner - 3.3%.

It is found that parents with pre-school and school-age children are most likely to benefit from childcare support. Thus, among the beneficiary parents, the largest share is for parents with pre-school children (4-6 years) - 50.2%, followed by parents with school-age children (7-14 years) - 26.4% and those with children aged under three years - 23.3%.

In Moldova, families with minor children actively use formal care and education services: crèches, kindergartens, after-school groups. Despite the fact that parents with children aged up to 14 years receive permanent help from relatives, they also use educational services such as: kindergarten 75.8%, after-school groups 13% and very rarely use the services of a nanny 2.7%. (*Table 3*). According to the GGS survey report (GGS, 2020), 40.2% of parents with children aged 3-6 years received regular childcare support from a nursery/ preschool, for children aged 0-6 years this indicator is 34.5%.

Table 3.

Descriptive statistics regarding informal childcare support

From whom did he receive help with childcare		Total (N)	Total for parents with children aged up to 14 years (%)
Got help (total)		**454**	**100**
Degree of relationship	My partner helped me	15	3,3
	My mother, stepmother, mother-in-law or partner's stepmother helped me	182	40,1
	My father, stepfather, father-in-law or partner's stepfather helped me	72	15,9
	My son/daughter, son/stepdaughter, daughter's partner/son-in-law, son's partner/daughter-in-law helped me	1	0,2
	Other relatives helped me (my grandparents or my partner's, nephew, sister, brother)	135	29,7
	I was helped by someone else who is not a relative (friends, acquaintances, neighbours, colleagues)	49	10,8
Age of children	0-3 years	106	23.3
	4-6 years	228	50.2
	7-14 years	120	26.4
Formal help: Childcare providers	Babysitter	223	2.7
	Day care centre		1.8
	Nursery or pre-school		75.8
	After-school care-centre		13.0
	Self-organised childcare group		1.3
	Other institutional arrangement		5.4

Moldovan society exhibits a profound sense of duty, underscored by traditional attitudes regarding the role of family and parental responsibilities. These cultural values emphasize the significant support that the older generation of grandparents can offer to their adult children (Table 4). A generally accepted beliefs among people aged 50 and over is that "grandparents have to look after grandchildren if their parents can't" (70%) and "if their adult children have difficulties, parents have to adapt their own lives to help them" (64.5%). Smaller but significant proportions of people aged under 50 also hold the same traditionalist opinions (58% and 54% respectively).

Table 4.
Opinions on parents'/grandparents' duty to care for their children/grandchildren

Age groups	Grandparents must take care of grandchildren if parents are unable to do so		If their adult children have difficulties, parents must adjust their own lives to help them	
	Disagree (strongly)	Agree (total)	Disagree (strongly)	Agree (total)
Aged up to 50 years	2,8	58	5,2	54
Aged 50 years and more	1,2	70	1,8	64,5

INFERENTIAL STATISTICS

The association between childcare help received from own parents in the last 12 months, and the eight control variables was studied separately with logistic regression. The results of the binomial logistic regression (Table 5) show that of the eight predictor variables, only four were statistically significant. Parental age, place of residence, education level, and relationship to parents predicted more childcare help (in the past 12 months) given to their own adult children compared to those giving childcare help but not to their adult children. The age of respondents with minor children influences the likelihood of receiving informal help from grandparents. Parents aged up to 49 are 90% likely to receive help from their parents. Place of living significantly influences the probability: moving from a rural to an urban area increases the odds by 2.298, and in Chisinau it is more than twice as likely to receive help from parents than in a rural area. For the variable "level of education" the reference category is "low education". Those with secondary or higher education also receive help more often, the difference is significant but less pronounced (68% and 77% respectively). However, those with higher education are 3.3 more likely to get their parents' help. It can be explained that families with higher level of education receive help often which may be an attempt to balance work and family life commitments. The good relation with parents increases the probability of getting the help. The probability of receiving help for those who are very satisfied with their relationship with their parents is 1.191 more likely than for those who are not satisfied at all. However, neither the age of children nor sex, presence of partner and household size, predicted minor childcare help given by grandparents.

Table 5.
Childcare help received from own parents in the past 12 months.
Logistic regression (OR), base group: receive childcare help but not from own parents

Independent variable	B	Sig. (p)	Exp(B)
Intercept	-2,725	0.01*	0.066*
Parent aged 49 or younger	2,235	0.002**	9.346**
Parent aged 50-59	1,523	0.009**	4.586**
Parent aged 60-69	0,997	0.08	2.71
Sex	-0,244	0.482	0.783
Urban area	0,832	0.032*	2.298*
Chisinau	0,933	0.021*	2.542*
Medium education	0,774	0.029*	2.168*
Higher education	1,194	0.003**	3.3**
Child aged 0-3	-0,277	0.489	0.758
Child aged 4-6	-0,17	0.708	0.844
Partner is not present due to work	0,232	0.719	1.261
Relationships with parents	0,175	0.022*	1.191*
Household size	0,21	0.109	1.234
Number of observations	**351**		
R-sq. Nagelkerke	**0,157**		
Reference values of variables included in the analysis: 1) Parent aged 70-79; 2) Male; 3) Rural area; 4) Low level of education; 5) Child aged 7-14 years; 6) Partner is present; 7) Relationships with parents - Not satisfied at all; 8) Household size – more than 3 members.			

**** p < 0,001; ** p < 0,01; * p < 0,05*
Source: developed by the authors based on GGS data, 2020

The association between childcare help given and the four control variables was also studied separately with binomial logistic regression. Parent age, sex, place of residence and household size predicted childcare help (in the past 12 months) to their own adult child(ren) when compared with those who give childcare help but not to their adult children (*Table 6*).

The results for the binary logistic regression show that, those aged 60 - 64 years are the most usual helpers. The help coming from the other groups varies, but overall people aged 50-69 are the most usual help-givers. We hence have an inverted-U-shaped relationship between the helper's age and help-giving. For respondents living in urban areas or in Chisinau, the probability of receiving help is higher than for those from rural areas. A bigger household increases the probability that the person will help somebody, and each new member adds 54% to the probability. We would note, however, that women help more than men (1.725). Grandmothers care for their grandchildren more often than grandfathers, and the number of respondents' household members predicts the amount of childcare assistance.

Being a woman aged 60-64 years, having more than three members in the household, living in urban area and mun. Chisinau, were good predictors of giving major childcare help to the respondents' own offspring.

Table 6.

Childcare help given to their adult children in the past 12 months. Binomial logistic regression (OR), the base group: give childcare help but not to their own adult children

Independent variable	B	Sig. (p)	Exp(B)
Intercept	-2,643	0***	0.071***
Parent aged 40-44	1,615	0***	5.028***
Parent aged 45-49	2,269	0***	9.67***
Parent aged 50-54	3,439	0***	31.156***
Parent aged 55-59	3,69	0***	40.045***
Parent aged 60-64	4,195	0***	66.354***
Parent aged 65-69	3,881	0***	48.473***
Parent aged 70-74	3,912	0***	49.999***
Parent aged 75-79	4,379	0***	79.758***
The interviewee is a woman	0,545	0***	1.725***
Urban area	-0,382	0.022*	0.682*
Chisinau	-0,713	0***	0.49***
Household size	0,165	0.022*	1.179**
Number of observations	**1406**		
R-sq. Nagelkerke	**0,32**		
Reference values of variables included in the analysis: 1) Parent aged 39 and younger; 2) Male; 3) Rural area; 4) 5) Household size – more than 3 members.			

**** p < 0,001; ** p < 0,01; * p < 0,05*

Source: developed by the authors based on GGS data, 2020

DISCUSSIONS AND CONCLUSIONS

This article analyzes childcare assistance as intergenerational support from the perspectives of both recipients and providers. The findings suggest that parents serve as a crucial source of private childcare aid for their adult children. Childcare assistance represents a form of social interaction, indicating that intergenerational solidarity is currently robust in Moldova. Both older and younger generations, show a strong sense of intergenerational support confirming the duty to help if their adult children have difficulties. Traditional attitudes about the role of the family and parental responsibilities highlight the support that the grandparents' generation can give to adult children.

The results show that women often than men receive childcare support from relatives. The same finding was obtained by other researchers (Svensson-Dianellou et al, 2010; Kyungmin et al, 2016). Furthermore, childcare support given from the maternal side of the family and to daughters is called "*female linkage*" (Hank, Buber, 2009). Studies have shown that in families where there is only one adult child the bond is even more pronounced

when the adult child becomes a parent, and support in caring for the grandchild(ren) from the grandmother is more likely (Hagestad, 2006).

Most frequently, respondents under the age of 49 receive assistance with childcare from their parents. Respondents with minor children in urban areas, especially those residing in the capital of Moldova - the municipality of Chisinau, more often receive support in childcare.

The probability of receiving help in childcare from their parents is higher for respondents with tertiary education. This is because university-educated women have demanding jobs or career responsibilities that require additional support with childcare. Therefore, they turn to their parents for assistance in managing childcare responsibilities to effectively balance their careers and family life.

In the realm of childcare givers, it's evident that women predominantly play the role of the primary caregivers. Specifically, grandmothers between the ages of 60 and 64 tend to provide childcare assistance more frequently to their own offspring compared to grandfathers. Additionally, certain factors emerged as significant predictors for providing substantial childcare help to their descendants. Residing in urban areas, particularly within the municipality of Chisinau, along with having households consisting of more than three members, stood out as strong indicators of offering significant childcare assistance to the respondents' own offspring. These factors appear to contribute significantly to the likelihood of grandparents providing substantial support and aid in childcare duties to their adults' children.

Nowadays, childcare is a crucial topic, since it is one of the key mechanisms to reconcile work and family. Intergenerational transfers are critical in countries where state welfare is weak and institutional provision of services is low and Moldova is an example in this sense. And studies show that receiving childcare help from grandparents has a positive impact on mothers' labor force participation (Aassve, et. al.,2012), which is an important goal for Moldova in the coming years, especially considering the decreasing working-age population. This topic deserves further study for a deeper understanding of intergenerational connections and their influence on various aspects of family life, including decision-making about the birth of children.

REFERENCES

Aassve, A., Arpino, B., & Goisis, A. (2012). Grandparenting and mothers' labour force participation: A comparative analysis using the generations and gender survey. Demographic Research, 27, 53–84. https://www.jstor.org/stable/26349917

Albertini, M., & Kohli, M. (2013). The Generational Contract in the Family: An Analysis of Transfer Regimes in Europe. European Sociological Review, 29(4), 828–840. http://www.jstor.org/stable/24480041

Albertini, M., & Radl, J. (2012). Intergenerational transfers and social class: Intervivos transfers as means of status reproduction? Acta Sociologica 55(2), 107-123. https://doi.org/10.1177/0001699311431596

Bengtson, V. L., & Robert, E. (1991). Intergenerational Solidarity in Aging Families: An example of formal theory construction. Journal of Marriage and Family, 53(4), 856-870. https://doi.org/10.2307/352993

Chisholm, J. F. (1999). The Sandwich Generation. Journal of Social Distress and the Homeless 8(3), 177-191. https://doi.org/10.1023/A:1021368826791

Chistruga-Sînchevici, I. (2021). Echilibrul dintre muncă şi viaţa de familie: necesităţi ale părinţilor şi rolul politicilor sociale. Chişinău, INCE. https://doi.org/10.36004/nier.2022.978-9975-89-251-3

Eibich, P., & Siedler, T. (2020). Retirement, intergenerational time transfers, and fertility. European Economic Review, 124. https://doi.org/10.1016/j.euroecorev.2020.103392

Emery, T. (2013). Intergenerational transfers and European families: Does the number of siblings matter? Demographic Research, 29, 247-274. https://doi.org/10.4054/DemRes.2013.29.10

Gagauz, O., & Prohnitski, V. (2022). Gender profile of income and consumption: evidence from the national transfer accounts of Moldova. Economy and Sociology(1), 87-99. https://doi.org/10.36004/nier.es.2022.1-08

Gagauz, Olga, Chistruga-Sînchevici, Inga, Buciuceanu-Vrabie, Mariana, Rojco, Anatolii, Pahomii, Irina (2021). Impactul pandemiei COVID-19 asupra familiilor cu copii. Chişinău. http://dspace.ince.md/jspui/handle/123456789/1412

García-Morán, E., & Kuehn, Z. (2017). With strings attached: Grandparent-provided child care and female labor market outcomes. Review of Economic Dynamics, 23, 80-98. https://doi.org/10.1016/j.red.2016.09.004

Georgas, J. (2004). Family and Culture. Encyclopedia of Applied Psychology, 11-22. https://doi.org/10.1016/B0-12-657410-3/00412-8

GGS. (2020). Generations & Gender Programme. In the Republic of Moldova. UNFPA. Retrieved from https://www.ggp-i.org/moldova

Giarrusso, R., & Putney, N. (2020). Intergenerational Solidarity. Encyclopedia of Gerontology and Population Aging. Springer, Cham. https://doi.org/10.1007/978-3-319-69892-2_901-1

Gierveld, J., Dykstra, P., & Schenk, N. (2012). Living arrangements, intergenerational support types and older adult loneliness in Eastern and Western Europe. Demographic Research, 27, 167-200. https://doi.org/10.4054/DemRes.2012.27.7

Grigoraș, E. (2022). Factori asociați cu nașterea copiilor de rang diferit la femeile din Municipiul Chișinău. Calitatea Vieții, 33(3), 216–233. https://doi.org/10.46841/RCV.2022.03.04

Hagestad, G. O. (2006). Transfers between grandparents and grandchildren: The importance of taking a three-generation perspective: Transfers zwischen Großeltern und Enkelkindern – Warum es wichtig ist, eine Drei-Generationen-Perspektive einzunehmen. Journal of Family Research, 18(3), p. 315–332. https://doi.org/10.20377/jfr-298

Hank, K., & Buber, I. (2009). Grandparents Caring for their Grandchildren: Findings From the 2004 Survey of Health, Ageing, and Retirement in Europe. Journal of Family Issues, 30(1), 53–73. https://doi.org/10.1177/0192513X08322627

Ingersoll-Dayton, B. N., Neal, M. B., Hammer, L. B. (2001). Aging Parents Helping Adult Children: The Experience of the Sandwiched Generation. Family Relations, 50(3), 262-271. https://doi.org/10.1111/j.1741-3729.2001.00262.x

Kohli, M. (2004). Intergenerational transfers and inheritance: A comparative view. Annual Review of Gerontology and Geriatrics, 24(1). 266-289. https://doi.org/10.1891/0198-8794.24.1.266

Kyungmin Kim, Karen L. Fingerman, Kira S. Birditt, Steven H. Zarit. (2016). Capturing Between- and Within-Family Differences in Parental Support to Adult Children: A Typology Approach, The Journals of Gerontology 71(6) 1034–1045, https://doi.org/10.1093/geronb/gbv029

Millward, C. (1998). Family relationships and intergenerational exchange in later life. Working Paper(15).

Mureșan, C. (2012). Schimbările comportamentului familial în România. O abordare din perspectiva cursului vieții.

Peterson, B. E. (2002). Longitudinal analysis of midlife generativity, intergenerational roles, and caregiving. Psychology and Aging, (17), 161-168. https://doi.org/10.1037/0882-7974.17.1.161

Pillemer, K., Suitor, J., Mock, S., Sabir, M., Pordo, T., & Sechrist, J. (2007). Capturing the Complexity of Intergenerational Relations: Exploring Ambivalence within Later-Life Families. Journal of Social Issues, 63, 775-791. https://doi.org/10.1111/j.1540-4560.2007.00536.x

Ribar, D., & Wilhelm, M. O. (2006). Exchange, role modeling and the Intergenerational transmission of elder support attitudes: Evidence from three generations of Mexican-Americans. Journal of SocioEconomics. 35(3), 514-31. https://doi.org/10.1016/j.socec.20

Svensson-Dianellou, A., Smith, P. K., & Mestheneos, E. (2010). Family help by Greek grandparents. Journal of Intergenerational Relationships, 8(3), 249-263. https://doi.org/10.1080/15350770.2010.498737

Thomese, F., & Liefbroer, A. (2013). Child care and child births: the role of grandparents in the Netherlands. Journal of Marriage and Family 75(2), 403-421. https://doi.org/10.1111/jomf.12005

APPENDIX

Table 1.

Share of providers and recipients of informal childcare support by gender, age, residence

		Total (N)	Provided childcare support (%)	Total (N)	Have received childcare support (%)
TOTAL		**1822**	**18,2**	**454**	**19,3**
Sex	Men	566	14,8	121	17,2
	Women	1256	20,3	337	20,2

		Total (N)	Provided childcare support (%)	Total (N)	Have received childcare support (%)
TOTAL		**1822**	**18,2**	**454**	**19,3**
Age groups	Up to 19 years	88	21,5	5	38,5
	20-29 years	200	19,6	134	25,0
	30-39 years	240	15,2	260	21,8
	40-49 years	207	15,0	50	9,7
	50-59 years	397	22,5	9	10
	60-69 years	539	21,2	0	0,0
	70-79 years	151	11,5	0	0,0
Place of residence	Rural	942	15,0	201	14,8
	Urban	431	19,3	123	21,0
	M. Chisinau	449	30,3	134	31,7
Level of education*	Low	748	15,5	182	16,9
	Medium	752	20,3	135	18,0
	Higher	322	21,7	141	26,2

**Note: According to the National Bureau of Statistics, low educational attainment (education) implies at most secondary education; medium educational attainment (education) - at least middle/high school and at most college education; and high educational attainment (education) - at least tertiary education (1st cycle).*

Table 2.

Structure of the sample of providers and recipients (beneficiaries) of informal childcare support by gender, age, residence, education level and occupational status

Profile of respondents in providing/receiving permanent assistance to childcare		Providers of childcare support		Beneficiaries of childcare support	
		Total respondents Providers of childcare support	(%)	Total respondents	(%)
Total		**1822**		**454**	
Sex	Men	566	31.1	120	26.4
	Women	1256	68.9	334	73.6
Age groups	Up to 19 years old	89	4.9	5	1.1
	20-29 years old	199	10.9	134	29.5
	30-39 years	239	13.1	256	56.4
	40-49 years	208	11.4	50	11.0
	50-59 years	397	21.8	9	2.0
	60-69 years	539	29.6	-	-
	70-79 years	151	8.3	-	-
Place of residence	Rural	942	51.7	200	44.1
	Urban	431	23.7	123	27.1
	Mun. Chisinau	449	24.6	131	28.9
Level of education	Low	750	41.1	127	28.0
	Medium	753	41.3	188	41.4
	Higher	322	17.6	139	30.6
Ocupational status	Employed	549	30.1	200	44.1
	Unemployed	184	10.1	47	10.4
	On maternity or paternity leave/On parental leave or childcare leave	81	4.4	133	29.3
	Retired	632	34.7	2	0.4
	Others	375	20.6	72	15.9

INSIGHTS INTO THE DEMOGRAPHIC WINDOW OF OPPORTUNITY AND DEMOGRAPHIC DIVIDEND: A CONCEPTUAL OVERVIEW

DOI: https://doi.org/10.36004/nier.es.2023.1-06
JEL classification: A12, A13, O10, O29, J10, J19
UDC: 314.012

Elena ȘOLDAN,
PhD student,
Department of Demography and Geodemography, Faculty of Sciences, Charles University, Czechia
Scientific researcher, National Institute for Economic Research, Academy of Economic Studies of Moldova

https://orcid.org/0009-0008-9600-3818
e-mail: elena.sholdan@gmail.com

Received 6 March 2023
Accepted for publication 30 May 2023

SUMMARY

The demographic dividend presents the conceptual framework through which changes in the population's age structure positively affect economic development. However, the demographic dividend is a complex concept, and, more than two decades after its inception, approaches remain diverse. This paper presents a literature analysis on the demographic dividend to understand the concept of the demographic dividend and its relationship to its interrelated term – the demographic window of opportunity.

The literature analysis was undertaken following an evolutionary approach, including an examination of definitions of the demographic dividend and methodologies for its assessment. Two different approaches to view the demographic dividend, the demographic and the economic, were discussed, as well as the two indicators – the demographic support rate and the economic support rate.

The results of the analysis confirmed the presumption of the demographic dividend and the demographic window of opportunity as being two distinct concepts – mutually interrelated but not substitutable. Also, for the analysis of the demographic dividend, the demographic support ratio indicator is as necessary as the economic support ratio, influencing the policy – making process at the national level in achieving the demographic dividend.

The study underlines the importance of distinguishing between the concept of the window of opportunity that is created by demographic change and the demographic dividend – the positive economic outcome of these changes. Employing the concept of a window of opportunity, directly linked to the demographic dividend, would create the integrative framework needed to identify the pathways of positive demographic influence on economic development.

Keywords: *demographic window of opportunity, demographic dividend, economic development, support ratio, policies*

Dividendul demografic prezintă cadrul conceptual prin care schimbările în structura de vârstă a populaţiei pot avea efecte pozitive asupra dezvoltării economice. Cu toate acestea, dividendul demografic este un concept complex şi, după mai bine de două decenii de la crearea sa, abordările în interpretarea acestuia rămân diverse. În această lucrare este prezentată analiza literaturii de specialitate cu privire la dividendul demografic, cu scopul reflecţiei ştiinţifice a conceptului de dividend demografic şi a relaţiei acestuia cu termenul său interconecta – fereastra demografică de oportunitate.

Analiza literaturii de specialitate a fost efectuată după o abordare evolutivă, incluzând o examinare a definiţiilor conceptului dividendul demografic şi a metodologiilor de evaluare a acestuia. Au fost discutate două moduri diferite de abordare a dividendul demografic, cel demografic şi cel economic, precum şi a doi indicatori principali - rata de suport demografică şi rata de suport economică.

Rezultatele analizei au confirmat ipoteza dividendului demografic şi a ferestrei de oportunitate demografică ca fiind două concepte distincte – deşi interconectate, nu sunt substituibile. De asemenea, pentru analiza dividendului demografic, indicatorul ratei de suport demografică este la fel de necesar ca şi rata de suport economică, influenţând procesul de elaborare a politicilor la nivel naţional pentru realizarea dividendului demografic.

Se concluzionează că este important de a distinge între conceptul de fereastra de oportunitate care este creată de schimbările demografice şi dividendul demografic – rezultatul economic pozitiv al acestor schimbări. Utilizarea conceptului de fereastră de oportunitate, direct legată de dividendul demografic, ar crea cadrul integrator necesar pentru a identifica pârghiile prin care schimbările demografice influenţează pozitiv dezvoltarea economică.

Cuvinte cheie: *fereastră demografică de oportunitate, dividend demografic, dezvoltare economică, rata de suport, politici*

Демографический дивиденд – это концептуальная установка, согласно которой изменения в возрастной структуре населения могут положительно сказаться на экономическом развитии. Концептуально демографический дивиденд является сложным понятием, и несмотря на то, что прошло более двух десятилетий после его появления подходы к его интерпретации, существенно различаются. В данной статье представлен обзор литературы по демографическому дивиденду, чтобы получить дополнительные сведения для понимания концепции демографического дивиденда и его связи с термином "демографическое окно возможностей".

В анализе литературы использовался эволюционный подход, включающий обзор определений концепта "демографический дивиденд" и методологий его оценки. Были рассмотрены два различных подхода к демографическому дивиденду – демографический и экономический, а также проанализированы два показате-

ля его оценки – традиционный коэффициент демографической поддержки и экономический коэффициент поддержки.

Результаты мета-анализа подтверждают предположение о том, что демографический дивиденд и демографическое окно возможностей – две разные концепции, взаимосвязанных, но не взаимозаменяемых. Для анализа демографического дивиденда показатель коэффициента демографической поддержки так же необходим, как и показатель экономической поддержки, что имеет существенное значение для разработки политики на уровне страны с целью использования демографического дивиденда.

Делается вывод о том, что важно разделять "окно возможностей", создаваемое демографическими изменениями, и ”демографический дивиденд” – положительный экономический результат этих изменений. Использование термина "окно возможностей", непосредственно связанного с демографическим дивидендом, позволит создать интегративную структуру, необходимую для определения путей достижения позитивного демографического влияния на экономическое развитие.

Ключевые слова: демографическое окно возможностей, демографический дивиденд, экономическое развитие, коэффициент поддержки, политика

INTRODUCTION

The demographic dividend narrative states that population positively influences economic development through beneficial population age composition when the working-age population predominates. Obtaining this economic gain, however, is strongly dependent on how governments can adapt to those demographic changes.

The non-deterministic nature of the demographic dividend has been repeatedly mentioned in the literature on demographic dividend narrative and discussions. At the same time, the achievement of the demographic dividend at the national level is not very much supported by the evidence. In addition, when it comes to the fundamentalistic analysis of how population age structure changes could impact the economy, the theoretical framework of the demographic dividend, becomes challenging, given its different interpretations.

Currently, a wide range of perspectives on the demographic dividend and its link with the demographic window has been noticed by the researchers. Nevertheless, integrative works focussing on the theoretical, methodological, and practical complexity of the demographic dividend have taken only in past years. The research attempts to join that discussion on the demographic dividend, demographic window, and population-development nexus. An insightful understanding of the demographic dividend will allow a better operationalization of the two terms and integration into developmental theories. Additionally, policy-related dependence on achieving the demographic dividend at the country level will critically depend on a proper understanding of the demographic dividend concept.

This article undertakes a conceptual analysis of the demographic dividend and demographic window of opportunity. Firstly, it was followed the evolution of the demographic dividend concept. Secondly, the demographic dividend definitions and methods have been analyzed. Then, it has been discussed the two indicators of the demographic dividend assessment – the economic and conventional support ratios. Lastly, the analysis of the political framework for demographic dividend achievement is also supportive of understanding the relation between demographic window and demographic dividend concepts.

LITERATURE REVIEW

How population dynamics influence economic growth was explained by Bloom and Williamson (1998). Accordingly, economic growth can be positively determined by population dynamics if the growth rate of the working population is more rapid than that of the dependent population. Taking evidence from the East Asian experience, the positive demographic impact occurs under proper political and institutional settings.

The work became a turning point in discourses on population and development - an actualized debate on accelerated population growth in late demographic transition countries and structural age transformation in advanced societies. A possible demographic transition in Sub-Saharan Africa would come with a promising result - the decline in fertility could induce an economic bonus - the demographic dividend previously experienced by East Asian tigers.

It was mentioned that the achievement of demographic dividend is realized through a series of reforms and policies that come above those of markets, particularly

from the fields of education, health, institutional and macroeconomic stability. A widely cited work (Cuaresma et al., 2014) argues, for example, that there would be no positive economic results due to demographic changes without improvements in education, and the demographic dividend is, in fact, an educational dividend.

In economic studies, the concept of demographic dividend has found, along with classical models, its applicability in other models of economic growth, such as the theory of Dual Economic Development (Cai, 2010). Within the NTA project, created to study the generational economy and the impact of the change in the population structure, the study of the demographic dividend also found its applicability (UN, 2013).

Aside from its popularity in both scientific and political areas, assumptions of the demographic dividend and its positive economic impact have not always been supported by evidence. According to social researchers, the phenomenon of the increase in the high percentage of young people in society (also called the youth bulge) is associated with an increased level of conflicts in different countries and regions (Furtuna, 2018). Also, based on the age structure variable, Cincotta (2008) predicted, the so-called Arab Spring - a series of revolutions in North Africa and the Middle East.

The research community has completed the non-deterministic nature of the demographic dividend, by mentioning that, a rapid increase, like during the current demographic transitions, of the working-age population would generate significant economic and social imbalances in the form of unemployment, internal conflicts, and population movement (Canning et al., 2015; Pool, 2007).

The term demographic window of opportunity was, from the beginning, intrinsically linked to the term demographic dividend. It was formulated in the context of the fact that demographic dividend is not automatic, but only a window of opportunity and depends on the ability of countries to properly react to the demographic changes (Bloom et al., 2003). Given the importance and increased interest in changing of the age structure composition, and the possible positive economic impact, United Nations (2004) conceptualizes the demographic window, using fixed age intervals for the period in which the proportion of the working-age population is at its historical maximum.

It can be observed, though, a bold underutilization of the term demographic window of opportunity in the demographic dividend narrative - in political discourses, and also in scientific literature. Also, the demographic dividend and demographic window are often treated as substitutable terms.

Studies that follow on demographic dividends are increasingly recognized, that is not a commonly accepted definition of the demographic dividend. The different field that covers the theoretical framework of the demographic dividend leads to different approaches for the demographic dividend treatment. These different views on demographic dividends have been classified into demographic, economic, and social approaches (Barsukov, 2019).

More than two decades of studies on the demographic dividend, a wide range of methods for assessing the demographic dividend, different way of treating the concept, and its importance in practical application, gave rise to the review studies, aiming to cover the methodological aspects of the demographic dividend (James, 2018; Oosthuizen & Magero, 2021) and the aplicability part of the demographic dividend - policy framework (Groth et al., 2019). The importance of such attention has been confirmed earlier by one of the proponents of the demographic dividend, mentioning that, the methods of estimation of the demographic dividend would influence interpretations and as a consequence, policy formulation (Williamson, 2013).

In this study, it is aimed to review the concept of demographic dividend and the demographic window.

The aim of the research is to get insights into the demographic dividend and demographic window concepts and the relation between them.

The main hypothesis is that the demographic dividend and demographic window are not substitutable, but complementary concepts.

Correspondingly, I have addressed four main questions:

1. *How in literature the concept of demographic dividend and demographic window has been developed to date?*
2. *Which are the main definitions offered to the demographic dividend to date, and are the diversity of methods for analysis influencing the definition of the demographic dividend?*
3. *To what extent does the indicator of economic support ratio substitute the conventional support ratio?*
4. What is the role of the demographic window in policy formulation for demographic dividend achievement?

DATA SOURCES AND METHODS

The systematic review has been constructed according to the Meta-Analysis (Prisma) Statement, including the inductive element for expanding the literature records. The search strategy of the literature has been focused on the terms of demographic dividend and demographic window.

The sample of articles was selected from Scopus and Web of Science databases and completed from Google Scholar from 1998 to 2023. An additional selection criterion represented the number of citations, as an important mark in disseminating the term of the demographic dividend and demographic window of opportunity.

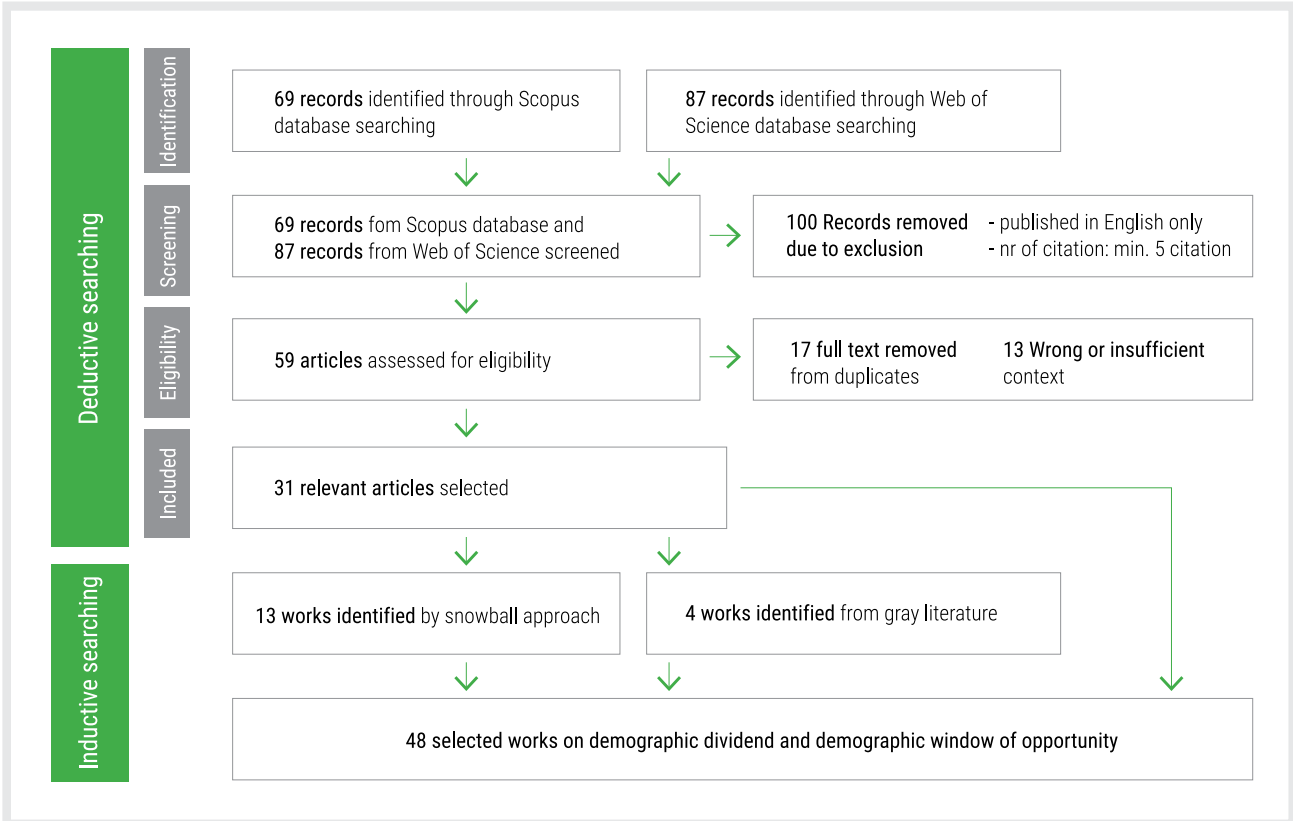
Table 1.

Search strategy for literature identification on topic of demographic dividend and demographic window of opportunity

Database	Concept	Keywords	Results	Results limited, English
Scopus	Demographic dividend	Demographic dividend (Title AND Abstract AND Keywords)	65	61
	Demographic window of opportunity	Demographic window (Title AND Abstract AND Key-words)	4	4
Web of Science	Demographic dividend	Demographic dividend (Title AND Abstract AND Authors Keywords)	71	63
	Demographic Window of opportunity	Demographic window (Title AND Abstract AND Authors keywords)	16	12

Figure 1.

PRISMA flow diagram for literature review on demographic dividend and demographic window of opportunity



RESULTS AND DISCUSSIONS

A. THE DEMOGRAPHIC DIVIDEND AND THE WINDOW OF OPPORTUNITY EXPERIENCED AN EVOLUTIONARY PROCESS

Studying the literature on the demographic dividend, it has been followed, chronologically, the evolution of the concept. I have distinguished four main stages summarised in table 2.

Table 2.
Evolution of the demographic dividend concept (1998-2023)

Period	Characteristic	Operational terms used	Publications
Period of inception (1998-2002)	- The analysis of demographic impact on economic development through age structure changes; - Conceptualization of the term: utilization of the term bonus, gain, demographic gift; - Comparison among regions. Evidence from regions experiencing demographic transition.	Economic growth; Demographic Transition; Rate of population growth; Demographic gain, bonus, gift.	(Bloom & Williamson, 1998; Mason, 2002)
Period of positioning (2003-2009)	- Increasing interest in both scientific and applied area; - Formulation of the term demographic dividend as a potential gain; - Applications of age structure to economic forecasting; - Formulation of the demographic window concept methodologically; - Proposed accounting framework NTA using economic support ratio indicator. - Broad coverage of countries and cross-country analysis.	Economic support ratio; Life cycle production and consumption; Second demographic dividend; Age distribution; Demographic dividend; Demographic window of opportunity; One-time opportunity; Age-structural Transition.	(Bloom et al., 2003, 2007; Bloom & Canning, 2004; Chandrasekhar et al., 2006; James, 2008; Lee & Mason, 2006; Mason, 2005; Mitra & Nagarajan, 2005; Nayab, 2008; Phang, 2007; Pool, 2007; Queiroz & Turra, 2005; United Nations, 2004; Vallin, 2005)
Period of expanded utilization (2010-2017)	- Recognition of the complexity of the concept, and its different treatments; - Expanded analysis and its mechanisms, the importance of employment, education and savings; - Depth study case analysis including factors and related indicators; - Discussion on the effect of migration, and internal labour market on the demographic dividend.	Economic development; Age structure changes; Potential economic gain; Youth bulge, Brain drain; Economic dependency ratio.	(Ahmed et al., 2016; Cai, 2010; Canning et al., 2015; Crespo Cuaresma et al., 2014; Eastwood & Lipton, 2011, 2012; Groth & May, 2017; Islam, 2016; Mason et al., 2016; Omoju & Abraham, 2013; Pace R. & Ham-Chande R. Editors, n.d.; Queiroz & Turra, 2010; Sathar et al., 2013; Ssewamala, 2015; Williamson, 2013; World Bank, 2016; Yip et al., 2010)
Period of reconceptualization (2018-2023)	- The distinction of the demographic window of opportunity period from the demographic dividend has gained more ground in literature; - Different definitions of the demographic dividend: potential or actual demographic dividend, depending on the method of assessment applied; - Works aimed to review the concept and methods used for demographic dividend analysis.	Economic growth; Youth empowerment; Fertility decline, Family Planning Human capital investment Surplus Labor Youth, Demographic disaster Entrepreneurship Economic life cycle	(Barsukov, 2019; Chauhan & Arokiasamy, 2018; Elhadary et al., 2018; Farid & Mostari, 2022; Groth et al., 2019; Islam, 2020; James, 2018; Margaret, 2020; May & Rotenberg, 2020; Oosthuizen & Magero, 2021; Woldegiorgis, 2023; Youssef et al., 2018)

Source: authors' elaboration

In the first stage - ***the period of inception (1998-2002)*** - attention was drawn to the growth rates of the working-age population and the possible impact on economic well-being. This unusual growth of the working-age population with its productive potential, was called a gift, gain, bonus, and only occasionally demographic dividend. Also, in this period, the term demographic window of opportunities also is utilized, mentioned in the context of policy measures needed to achieve the demographic dividend. Right from the wording, the need to draw attention to the non-deterministic nature of the concept and the possibility of confusion in this regard was specified: „The term demographic bonus or dividend is misleading if taken too literally because it suggests that the economic benefits are certain. What the developing countries are actually experiencing is a demographic opportunity" (Mason, 2002:1)

The researchers that followed in ***the period of positioning (2003-2009)***, were the result of an increased interest both from a scientific and practical domain. The term gain, bonus has been replaced by the term demographic dividend. In this period, the window of opportunity is specified as it is a one-time opportunity, referring to limited-time benefits that demographic transformations can induce. The fact that structural transformations can be also the result of population momentum or other factors influencing fluctuations in the age structure of the population in post-transition countries is mostly ignored. Also at this stage, different approaches are proposed to account for the concepts. Researchers recognize, though, that the optimism related to the demographic dividend concept on the one hand, and strong policy dependence on it could create misconceptions: "What needs to be emphasized here is that economic gains from demographic dividend are not certain, as the term might misleadingly imply" (Nayab, 2008).

The period of expended utilization (2010-2017) on demographic dividend includes an analysis of the mechanisms for demographic dividend achievement: savings, education, and employment. After the first decade of using the concept, a temperation of the demographic dividend optimistic discourse can be observed. When reviewing the demographic dividend in 2013, Williamson raised discussions on a whole range of economic aspects that might affect the achievement of the demographic dividend. The literature is also enriched with studies regarding the estimation of the window of opportunity (United Nations, 2004) and integrative works on demographic dividend and demographic window (Pace & Ham-Chande, 2016).

The period of reconceptualization (2018-2023) became more critical on the view of the demographic dividend, with more frequent asking if there is a demographic dividend or demographic burden in the context of the late transitional countries. The literature in this period includes work aiming to review the demographic dividend and its methodologies for assessment. Attention to distinguishing between demographic dividend and the demographic window gained more interest. In addition, a wide range of methodologies for the assessment of the demographic dividend gave rise to a different way of treating the demographic dividend: a potential or actual demographic dividend.

The accounting approach NTA distinguishes two demographic dividends: the first and the second demographic dividend. When formalized in its conventional view, the demographic dividend, on its own, is the result of two effects through which age structure change has its economic impact: the mechanical effect is the increase in the working-age population with its increase in labor implied. The second effect is behavioral, and it refers to an increase in savings and human capital with its beneficial impact on productivity. It should be mentioned that the separation of the dividend in the first and second dividend concepts lined up with this formalization. The second demographic dividend is mostly associated with the post-transitional period when an aging society induces an economic benefit, but again, with an increase in savings and productivity effect of increased human capital. Also while separating by their way of functioning, the proponents of the second dividend concept mention that both the first and second dividends are nonsequential phenomena.

Overall, following the literature to date, it can be observed that the demographic window of opportunity has been an interrelated concept since the beginning. It evaluates, though, from a metaphorical formulation, "the demographic dividend is merely a demographic window" to the separate methodology of assessment of the demographic window and demographic dividend.

B. DIVERSITY IN DEMOGRAPHIC DIVIDEND DEFINITIONS IS INFLUENCED BY THE APPROACHES AND METHODS OF ANALYSES APPLIED.

During the literature review, it has given attention to the definitions and theoretical explanations of the demographic dividend and how authors are treating the dividend. It revealed two main tendencies: the demographic dividend is treated either as an opportunity for economic growth (the demographic window, in my interpretation) or as the economic outcomes resulting from the demographic changes (the demographic dividend). Definitions of the demographic dividend from the literature survey have been summarized in the tab. 3. The diversification can be observed not only in the definitions but also in the methods of analysis. Moreover, the definition of demographic dividend will be shaped depending on what is focused on: the demographic component or the economic component of the demographic dividend.

Table 3.
Definitions given to demographic dividend concept by different authors

Publication	Method	Definition	Remarks
(Phang, 2005:123)	Accounting approach	"The "demographic dividend" refers to the opportunity for economic growth brought about by the increasing proportion of the working-age population during the demographic transition".	The demographic dividend concept is treated as an opportunity for economic growth.
(Nayab, 2008:2)	Descriptive	"The demographic dividend can be defined as the potential economic benefit offered by changes in the age structure of the population, during the demographic transition, when there is an increase in working-age population and an associated decline in the dependent age population".	The dividend is treated as a potential economic benefit during age-structural changes.
(James, 2008:63)	Econometric method, the two-stage least square (2SLS) method.	"The demographic dividend is defined as a rise in the rate of economic growth due to a rising share of working-age people in a population".	In the author's acceptance, economic growth is not a potential, but an actual economic growth.
(Omoju & Abraham, 2013:353)	Descriptive	"The demographic dividend is the socio-economic opportunity that emerges in a country as fertility rates decline which can lead to economic growth and development when supported with appropriate and effective public policies".	Treated demographically (age structure changes) with economic impact.
(Sathar et al., 2013:63, 5)	Multi-state population projection method	"The demographic bonus or demographic dividend refers to the opportunity created over a period of about 40–50 years during which, as a result of reduced proportions of dependent children, the proportion of the population of labor force age increases significantly, resulting in direct and indirect opportunities to increase per capita output".	The demographic dividend presents an opportunity to increase per capita output.
(Crespo Cuaresma et al., 2014:299)	Panel data regression approach	"The beneficial effect of changes in age structure after a decrease in fertility has become known as the "demographic dividend".	Positive effect as a result of demographic factors.
(Canning et al., 2015:1)	Descriptive (book)	"The demographic dividend describes the interplay between changes in a population's age structure due to the demographic transition and rapid economic growth. Having a large number of workers per capita gives a boost to the economy provided there are labor opportunities for the workers ".	The used word interlay between age structure and economic growth.
(Groth & May, 2017:1)	Descriptive, book	"The concept of the demographic dividend (DD), i.e., the accelerated economic growth and increasing surplus resulting from an expansion of the working-age population with respect to the young dependent population".	The economic growth is accelerated by the working-age population increase, the surplus represents the demographic dividend.
(James, 2018:2)	Review of methods and approaches	The demographic dividend signifies the process of changing age structure and its possible impact on economic development. Demographic window is defined as the duration in which the working age population is maximum to create better economic opportunities".	The demographic dividend is viewed as a positiv economic impact. The demographic window is a period.

Publication	Method	Definition	Remarks
(Chauhan & Arokiasamy, 2018:2)	Accounting approach	"The term demographic dividend is understood as the eventual rise in the economic growth due to a rising share of working-age people in the population. Demographic dividend occurs as a result of an increase in the workforce which if employed productively can give rise to a demographic dividend".	The eventual rise in economic growth as result of the increase in working-age population.
(Barsukov, 2019:171)	Cluster approach	"Demographic dividend is a potential of economic growth which could be caused by the change of population's age structure".	The demographic dividend is treated as being a potential economic output, resulting from demographic factors.
(Margaret, 2020:7)	Theoretic approach	"The demographic dividend is a temporary opportunity for faster economic growth that begins when fertility rates fall, leading to a larger proportion of working-age adults and fewer young dependents ".	The demographic dividend is treated as an opportunity for accelerated economic growth.
(Islam, 2020:1)	Accounting approach	"The economic and social benefits derived from the demographic changes are termed by demographers as demographic "dividend" or "bonus" or "window of opportunity".	Demographic dividend: both economic and social benefits derived from demographic changes.

Source: authors' elaboration

When treated from a demographic point of view, the dividend is the beneficial period, i. e. the demographic window of opportunity. On the other hand, treating from an economic standpoint, the dividend is the economic outcome.

The productive potential of the working-age population is the main argument for positive economic outcomes in this period. By analyzing the concept, it should be considered that a window of opportunity is related to the increase of the working-age population while the demographic dividend is the consequence, one of the positive scenarios of this evolution.

The demographic window represents a demographic concept that characterizes a specific period of population age structure. It does not replace, though the demographic dividend term, which denotes a hypothetical or actual positive economic outcome in the period of demographic changes. While the demographic window is a term related to population changes, the demographic dividend is one of the economic essences, resulting from measures implementation at the state level.

C. ASSESSMENT OF THE DEMOGRAPHIC WINDOW EXCLUSIVELY THROUGH THE ECONOMIC SUPPORT RATIO MAY DISTORT THE IDENTIFICATION OF THE DEMOGRAPHIC PERIOD BENEFICIAL FOR ECONOMIC DEVELOPMENT

The literature survey revealed that the different treatments of demographic dividend concepts have a profound methodological base. We have seen previously, that demographic dividend and demographic window, have had a tendency to be treated conceptually and theoretically as substitutable terms.

Also, when it comes to indicators for the demographic dividend assessment, researchers see the economic support ratio as being more preferable to the conventional support ratio. The explanation that comes is that the fixed age interval to ascertain the working-age population may not capture the employment state, as people may work after pension age, while most of the young population can be involved significantly later in the labor that at the age of 15 or 20.

The demographic window of opportunity was defined by the United Nations (2004) as the period when the proportion of the population under the age of 15 falls below 30 percent, while the proportion of people age 65 and older is still under 15 percent. The indicator proposed is the dependency ratio which measures the ratio of dependents to the working-age population. The converse of the dependency ratio is the support ratio. The increase in the demographic support ratio can be also used to indicate the moment of opening the demographic window of opportunity.

The economic support ratio, on the other hand, is utilized to estimate the demographic dividend through the accounting method extensively utilized within the NTA approach project. Under this approach, the demographic dividend represents the positive growth rate of the economic support ratio. The period of demographic dividend is when the number of producers is growing faster than the number of consumers. The composite indicator economic support ratio incorporates not only the demographic but also the employment and productivity components along with the consumption profile of the population.

To estimate the demographic dividend through the accounting method, the demographic support ratio also can be used. Nevertheless, the ratio of those who produce to non-producers will be distorted by the reason previously mentioned. In this way, the economic support ratio is instrumental for the estimation the demographic dividend under the accounting approach. The analysis of the demographic dividend for certain countries could be strongly restricted by the available data. The indicators support ratio and more recently, the economic support ratio remains the basic instruments given the accessibility that indicators may offer. However, quantifying the demographic dividend is just as important as creating well-informed guidelines for achieving the demographic dividend. The estimation of the demographic window through demographic indicators is crucial in assessing this beneficial period, when necessary measures have to be undertaken in order to achieve the demographic dividend, or at least, to react to the demographic changes.

Undoubtedly, the demographic dividend concept includes in its essence both the economic and demographic components and intuitively, the economic support ratio simplifies and summarizes the story of the age population composition impacting economic growth. Those simplifications, though, are not too helpful when charting the ways to achieve a positive outcome – the demographic dividend. In contrast to demographic prospects, economic growth and development is a less predictable scenario and the development of markets is influenced by a multitude of forces.

Understanding when a country goes into the demographic window of opportunity stage represents the starting point in the formulation of the necessary measures to capture the demographic dividend. The demographic dividend has a profound economic nature, but its realization involves a series of measures that go beyond macroeconomics. The value of the demographic concept remains in its developmental dimension, and the exclusive use of the economic support rate might be insufficient for such a complex task.

D. THE FORMULATION OF POLICY MEASURES FOR ACHIEVING THE DEMOGRAPHIC DIVIDEND IS INFLUENCED BY ASSESSING THE DEMOGRAPHIC WINDOW PERIOD.

Along with the evolution of the demographic dividend interpretation and measurement, we also have an overview of the political framework for a demographic dividend. We have observed that the support ratio indicators discussed previously, support our hypothesis of the demographic dividend and demographic window as two separate concepts. In addition, our literature overview on the political framework is also instrumental.

Firstly, researchers underlined that the separation of the demographic indicator is important because obtaining relevant information about the actual and forecast states of the demographic system is one of the key tasks of strategic planning for sustainable development (Barsukov, 2019)

The necessity to differentiate the demographic and economic components of the demographic dividend narrative has been also underlined more recently, interlinking its methodological and practical dimensions in the purpose of obtaining the demographic dividend. In his paper review, (James, 2018) concluded that two important aspects of measuring the demographic dividend are important to be discussed. First of all, the problem of time for different countries and regions: When does the window of opportunity open, and how long does it last? The second line of questioning is, how do we establish the causality between the age structure of the population and economic growth? This kind of study aims to discuss to what extent, these methodologies can answer important questions related to measures for achieving the demographic dividend. In other way formulated, to what extent the key methodologies that estimate the demographic dividend are able to respond to the types of issues facing policymakers in late transitional countries in their efforts to obtain benefits from demographic changes (Oosthuizen & Magero, 2021).

More recent literature specified that the realization of the demographic dividend story is not so facile to undertake - institutionally, politically, and economically. It thus becomes crucial, to analyze the demographic dividends at the country level in a detailed multidisciplinary and multisectoral manner: “Governments across the region continue to grapple with the policy decisions focused at supporting the realization of the demographic dividend, including in the areas of education, health, and the labour market. At the same time, countries are exposed on an ongoing basis to a variety of shocks, which have the potential to complicate or partially derail these efforts, requiring societies and policymakers to adapt to changing circumstances. Importantly, increased

emphasis on the need for policy interventions to actively include all citizens within growth processes — notions such as inclusive or shared growth—and recognition of the wide range of experiences, conditions and contexts within society mean that reliance on average or aggregate measures is insufficient for effective policymaking." (Oosthuizen & Magero, 2021:7)

A step forward in dividend policy studies was made by Groth, May and Turbat (2019) who classify policy obtaining the demographic dividend into necessary policies and sufficient policies. All these policies are designed to improve indicators such as dependency ratio, employment dependency ratio, and socioeconomic dependency ratio. The improvement of each of these indicators requires the implementation of its specific policies. For example, improvement of the dependency ratio for achievement of the demographic dividend refers to the policies related to the population, necessary to open the window of opportunity, to support smaller families.

The employment dependency ratio, similar to the economic support ratio implies the improvement of the labour market and ensuring the absorption of the surplus of the population of working age. The improvement of the socioeconomic dependency ratio, requires improvement in human capital, ensuring the necessary level of consumption and strengthening the agency of those in poverty. Barrientos and Hulme (2009) for example, acknowledge the growing consensus around the view that social protection is an essential component of economic and social development strategies.

In addition, is was mentioned the whole range of mechanisms through which population age structure may influence economic development, of which the most important are labor participation, savings, and human capital. Work focused on interconnections has much of its contribution to demographic dividend theory. Thus, thinking about the policy framework to obtain the demographic dividend in the frame of the mechanisms for the dividend functioning is another way to provide a functional framework. In this sense, a multitude of other indicators, from diverse domains will be needed.

CONCLUSIONS

In this article, we reviewed the conceptual framework of the demographic window of opportunity and of demographic dividend. The main purpose of the article is to get an insight into the demographic dividend and demographic window concepts and the relation between them.

The main finding is that the demographic dividend and demographic window of opportunity are not substitutable but complementary concepts; while the window of opportunity refers to the demographic changes, the demographic dividend represents the positive economic result of these changes. This conclusion relies upon four main results on the literature survey.

Firstly, following chronologically the literature to date, it was found that the demographic window and the demographic dividend have experienced an evolutionary process. It evolves from the metaphorical formulation "the demographic dividend is not merely a demographic window" to separated approaches for its measurement and assessment.

Secondly, a review of the definition of demographic dividend revealed the different approaches for demographic dividend treatment and measurement, in particular the demographic and economic approach. Those different approaches to view of the demographic dividend, though, may create confusion. In essence, when treated from a demographic standpoint, the demographic dividend represents the beneficial period - the demographic window. By contrast, when viewed from an economic perspective, the demographic dividend is the economic outcome, the positive economic result of the demographic beneficial period. We conclude that a demographic window represents a demographic concept that characterizes a specific period of population age structure. By contrast, the demographic dividend is a hypothetical or actual positive economic outcome in the period of demographic changes. These separations are important and substitution of terms complicates understanding of the conceptual framework of the demographic dividend.

The expanded accounting approach gave priority to the summary indicator of the economic support ratio, ignoring the demographic aspect of the demographic dividend narrative - the population age structure changes. Nevertheless, the assessment of the beneficial demographic period is as important as accounting for the potential demographic dividend - it provides the necessary base for decisions and measures formulation to achieve the demographic dividend. As such, the third result is that the economic support ratio is as important as the demographic support ratio in the analysis of the demographic dividend.

The fourth finding is that the accurate formulation of policy measures for achieving the demographic dividend is influenced by assessing the demographic window period. Identification of the demographic beneficial period, utilization of the demographic indicators and demographic window concept are necessary to create macroeconomic management tools

for the achievement of the demographic dividend. Distinguishing from demographic window to demographic dividend concept is important for a more accurate policy formulation to channel the creative, innovative, and productive potential of a population with beneficial age composition.

This paper attempts to understand the demographic dividend, the demographic window and the relation between them. A clear comprehension of the demographic dividend concept is necessaire for better operationalization of the two terms, orienting policy implementation as the demographic dividend achievement would be more possible.

REFERENCES

Ahmed, S. Cruz, M., Quillin, B., & Schellekens, P. (2016). Demographic change and development a global typology. *World Bank Policy Research Working Paper*. 7893. Available at SSRN: https://ssrn.com/abstract=2874029

Barrientos, A., & Hulme, D. (2009). Social protection for the poor and poorest in developing countries: reflections on a quiet revolution. *Oxford Development Studies*, 37(4), 439–456. https://doi.org/10.1080/13600810903305257

Barsukov, V. N. (2019). From the demographic dividend to population ageing: world trends in the system-wide transition. *Economic and social changes-facts trends forecast, 12*(4), 167–182. https://doi.org/10.15838/esc.2019.4.64.11

Bloom D. E., & Williamson J. G. (1998). Demographic transitions and economic miracles in emerging Asia. *The World Bank Economic Review, 12*(3), 419–455. https://doi.org/10.1093/wber/12.3.419

Bloom, D. E., & Canning, D. (2004). Global demographic change: dimensions and economic significance. *Population and Development Review*, 34, 17–51. http://www.jstor.org/stable/25434758

Bloom, D. E., Canning, D., & Sevilla, J. (2003). *The demographic dividend: a new perspective on the economic consequences of population change*. Rand. https://www.rand.org/pubs/monograph_reports/MR1274.html

Bloom, D. E., Canning, D., Fink, G., & Finlay, J. E. (2007). Does age structure forecast economic growth? International *Journal of Forecasting, 23*(4), 569–585. https://doi.org/10.1016/j.ijforecast.2007.07.001

Cai, F. (2010). Demographic transition, demographic dividend, and Lewis turning point in China. *China Economic Journal*, 3(2), 107–119. https://doi.org/10.1080/17538963.2010.511899

Canning, D., Raja, S., & Yazbeck, A. S. (Eds.). (2015). *Africa's demographic transition: dividend or disaster?* In: World Bank Group. http://documents.worldbank.org/curated/en/802811468187135148/Africa-s-demographic-transition-dividend-or-disaster

Chauhan, S., & Arokiasamy, P. (2018). India's demographic dividend: state-wise perspective. *Journal of Social and Economic Development, 20*(1), 1–23. https://doi.org/10.1007/s40847-018-0061-7

Cincotta, R. P. (2008). How democracies grow up. *Foreign Policy*, 165, 80–82. Aviable: https://foreignpolicy.com/2009/10/09/how-democracies-grow-up/

Cuaresma, Crespo J., Lutz, W., & Sanderson, Warren. (2014). Is the Demographic Dividend an Education Dividend? *Demography, 51*(1), 299–315. https://doi.org/10.1007/s13524-013-0245-x

Eastwood, R., & Lipton, M. (2011). Demographic transition in sub-Saharan Africa: How big will the economic dividend be? *Population Studies*, 65(1), 9–35. https://doi.org/10.1080/00324728.2010.547946

Eastwood, R., & Lipton, M. (2012). The demographic dividend: Retrospect and prospect. *Economic Affairs, 32*(1), 26–30. https://doi.org/10.1111/j.1468-0270.2011.02124.x

Elhadary, Y., Abdelatti, H., & Nour, A. (2018). Demographic Dividends in Sudan: Opportunities and Challenges. Journal of Scientific Research and Reports, 19(4), 1–19. https://doi.org/10.9734/jsrr/2018/41955

Farid, S., & Mostari, M. (2022). Population transition and demographic dividend in Bangladesh: extent and policy implication. *Journal of Social and Economic Development*, 24, 108–126. https://doi.org/10.1007/s40847-021-00173-x

Furtună, D. (2017). *Homo Aggressivus. De ce nu se opresc războaiele și violența*. Ed II. Mihăilești: ON, 675 p. ISBN 978-606-94270-0-2.

Groth, H., & May, J. F. (2017). *Africa's population: In search of a demographic dividend*. Springer International Publishing. https://doi.org/10.1007/978-3-319-46889-1

Groth, H., May, J. F., & Turbat, V. (2019). Policies Needed to Capture a Demographic Dividend in Sub-Saharan Africa. *Canadian Studies in Population, 46*, 61–72. https://doi.org/10.1007/s42650-019-00005-8

Islam, M. M. (2016). Demographic transition and the emerging windows of opportunities and challenges in Bangladesh. *Journal of population research, 33*, 283–305. https://doi.org/10.1007/s12546-016-9174-z

Islam, M. M. (2020). Demographic transition in Sultanate of Oman: emerging demographic dividend and challenges. *Middle East Fertility Society Journal, 25*(1). https://doi.org/10.1186/s43043-020-00022-7

James, K. S. (2008). Glorifying malthus: Current debate on "demographic dividend" in India. *Economic and Political Weekly, 43*(25), 63–69. https://www.epw.in/journal/2008/25/special-articles/glorifying-malthus-current-debate-demographic-dividend-india.html

James, K. S. (2018). Measuring demographic dividend: Approaches and Methods. In *Janasamkhya, XXXVI–VII*. https://janasamkhya.net/online/1819/001.pdf

Lee, R. D., & Mason, A. (2006). What is the demographic dividend? *Finance and Development, 43*(3), 16–17. https://www.scopus.com/inward/record.uri?eid=2-s2.0-33751509730&partnerID=40&md5=1c1cbb379d03a2d3cfdc0581cbfcd6ef

Margaret, K. (2020). Youth Empowerment in Kenya: Paths to the Demographic Dividend. *African Multidisciplinary Journal of Research (AMJR), 5*(2), 1-32. https://journals.spu.ac.ke/index.php/amjr/article/view/88/83

Mason, A. (2003). Capitalizing on the Demographic Divdend. In: *Population and Poverty: Achieving equity, equality and sustainability. Series 8 Population and development strategies*. New York, (pp. 39-48). https://www.unfpa.org/sites/default/files/pub-pdf/population_poverty.pdf

Mason, A. (2005). Demographic transition and demographic dividends in developed and developing countries. https://www.un.org/en/development/desa/population/events/pdf/expert/9/mason.pdf

Mason, A., Lee, R., & Jiang, J. X. (2016). Demographic dividends, human capital, and saving. *Journal of the Economics of Ageing, 7*, 106–122. https://doi.org/10.1016/j.jeoa.2016.02.004

May, J. F., & Rotenberg, S. (2020). A Call for Better Integrated Policies to Accelerate the Fertility Decline in Sub-Saharan Africa. *Studies in family planning, 51*(2), 193–204. https://doi.org/10.1111/sifp.12118

Mitra, S., & Nagarajan, R. (2005). Making use of the window of demographic opportunity: an economic perspective. *Economic and Political Weekly, 40*(50), 5327–5332. https://www.epw.in/journal/2005/50/special-articles/making-use-window-demographic-opportunity.html

Nayab, D. E. (2008). Demographic dividend or demographic threat in Pakistan? *The Pakistan Development Review, 47*(1), 1–26. https://www.jstor.org/stable/41260816

Omoju, O. E., & Abraham, T. W. (2014). Youth bulge and demographic dividend in Nigeria. *African Population Studies*, 27(2), 352–360. https://doi.org/10.11564/27-2-480

Oosthuizen, M., & Magero, J. (2021). Modelling the Demo graphic Dividend: *A Review of Methodologies*. https://esaro.unfpa.org/sites/default/files/pub-pdf/modelling_the_demographic_dividend-_a_review_of_methodologies_v5_1.pdf

Pace, Roberta., & Ham-Chande, Roberto (eds). (2016). *Demographic Dividends: Emerging Challenges and Policy Implications. Demographic Transformation and Socio-Economic Development,* vol 6. Springer, Cham. https://link.springer.com/book/10.1007/978-3-319-32709-9

Phang, H. S. (2007). Demographic dividend and labour force transformations in Asia: the case of Korea. In *United Nations Expert Group Meeting on Social and Economic Implications of Changing Population Age Structures Mexico City, 31 August – 2 September 2005*. ESA/P/WP.201, Unted Nations, New York (pp. 119-139). https://www.un.org/en/development/desa/population/events/pdf/expert/9/full_report.pdf

Pool, I. (2007). Demographic Dividends: Determinants of Development or Merely Windows of opportunity. *Ageing Horizons*, 7, 28-35. https://www.ageing.ox.ac.uk/download/44

Queiroz, B. L., & Turra, C. M. (2010). Window of Opportunity: socioeconomic consequences of demographic changes in Brazil. https://ntaccounts.org/doc/repository/QT2010.pdf

Roychowdhury, A., Chandrasekhar, C. P., Ghosh, J. (2006). The "Demographic Dividend" and Young India's Economic Future, *Economic & Political weekly 41*(49). https://www.epw.in/journal/2006/49/special-articles/demographic-dividend-and-young-indias-economic-future.html

Sathar, Z., Royan, R., & Bongaarts, J. (editors). (2013). *Capturing the Demographic Dividend in Pakistan*. New York. https://pakistan.unfpa.org/sites/default/files/pub-pdf/2013_CapturingDemoDivPak_0.pdf

Ssewamala, F. M. (2015). Optimizing the "demographic dividend" in young developing countries: The role of contractual savings and insurance for financing education. *International Journal of Social Welfare, 24*(3), 248–262. https://doi.org/10.1111/ijsw.12131

Turra, C. M., & Queiroz, B. L. (2007). Before it's too late: demographic transition, labor supply, and social security problems in Brazil. In *United Nations Expert Group Meeting on Social and Economic Implications of Changing Population Age Structures Mexico City, 31 August – 2 September 2005*. ESA/P/WP.201, Unted Nations, New York (pp. 103-118). https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=b53fbf486051b9c5cfdc6af5a61b5978d59c3d02#page=117

United Nations. (2004). *World Population to 2300:* Department of Economic and Social Affairs, Population Division. ST/ESA/SER. A/236, United Nations, New York. Available: https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/files/documents/2020/Jan/un_2002_world_population_to_2300.pdf

United Nations. (2013). *National Transfer Accounts Manual: Measuring and Analysing the Generational Economy*. United Nations, New York. Available: https://ntaccounts.org/doc/repository/NTA%20manual%202013.pdf

Vallin, J. (2005). The demographic window: An opportunity to be seized. *Asian Population Studies, 1*(2), 149–167. https://doi.org/10.1080/17441730500317170

Williamson, J. G. (2013). Demographic Dividends Revisited. *Asian Development Review, 30*(2), 1-25. https://doi.org/10.1162/ADEV_a_00013

Woldegiorgis, M. M. (2023). Towards inclusive development through harnessing demographic dividend? Empirics for Africa. *Journal of Social and Economic Development, 25*(2), 380–402. https://doi.org/10.1007/s40847-023-00243-2

World Bank. (2016). Policy Priorities in an Era of Demographic Change. In *Global Monitoring Report 2015/2016: Development Goals in an Era of Demographic Change* (pp. 191–226). https://doi.org/10.1596/978-1-4648-0669-8_ch6

Yip, P. S. F., Cheung, K. S. L., Law, S. C. K., Chi, I., & Robine, J. M. (2010). The demographic window and economic dependency ratio in the Hong Kong SAR. *Asian Population Studies, 6*(2), 241–260. https://doi.org/10.1080/17441730.2010.494452

Youssef, H., Elden, N. M. K., & Abou Ali, H. (2018). Realising the Prospects of the Demographic Dividend in Selected Arab Countries. *Epidemiology Biostatistics and Public Health, 15*(3), https://doi.org/10.2427/12888

ADVANCING DIGITAL MARKETING IN MOLDOVA: AN ANALYSIS BASED ON A SOCIOLOGICAL SURVEY OF ENTREPRENEURS

DOI: https://doi.org/10.36004/nier.es.2023.1-07
JEL classification: M00, M39, C83
UDC: 339.138:004.738.5(478)

Valerii GAGAUZ,
PhD student, Academy of Economic Studies of Moldova

https://orcid.org/0000-0003-3011-2081
e-mail: gagauzvf@gmail.com

Olga GAGAUZ,
Habilitated Doctor in sociology, Associate Professor,
National Institute for Economic Research, Academy of Economic Studies of Moldova

https://orcid.org/0000-0002-1175-1008
e-mail: gagauz_olga@ince.md

Received 22 February 2023
Accepted for publication 27 June 2023

SUMMARY

The article presents the results of a study on the implementation of digital marketing in Moldovan enterprises. Based on a sociological study conducted by the author in May-June 2023 among entrepreneurs (N=131), the level of digital marketing usage, current trends, awareness of digital marketing technologies and tools, as well as the difficulties encountered by entrepreneurs in using digital marketing tools, are identified. The data has been processed using multiple correspondence analysis (MCA) and Hierarchical Clustering on Principle Components (HCPC) in the programming language R. The research is descriptive in nature, as it aims to gather empirical information that provides a comprehensive understanding of the phenomenon under investigation and its structural elements.

Four clusters, each comprising enterprises of different sizes, were identified: 1) enterprises less advanced in digital marketing, 2) enterprises with complex marketing strategies but limited resources, 3) enterprises that combine traditional and digital marketing methods, 4) the most advanced enterprises in digital marketing. Marketing on social media holds a prominent position in the marketing activities of enterprises regardless of their size. SMEs face certain challenges in marketing activities overall and in the use of digital marketing tools, in particular.

Previous research on this topic is quite limited, and this current study is unique in that it considers the issue in the context of SMEs and Central and Eastern European countries. We show that SMEs, along with large companies, can have complex marketing strategies and successfully use modern digital marketing tools.

Keywords: *digital marketing, entrepreneurial marketing, survey*

Acest articol prezintă rezultatele unui studiu privind implementarea marketingului digital la întreprinderile din Moldova. Pe baza unui sondaj sociologic realizat de autor în perioada mai-iunie 2023 în rândul antreprenorilor (N=131), au fost determinate nivelul de utilizare a marketingului digital, tendinţele actuale şi nivelul de conştientizare a tehnologiilor şi instrumentelor de marketing digital, dificultăţile cu care se confruntă antreprenori în utilizarea instrumentelor de marketing digital. Datele au fost prelucrate utilizând analiza corespondenţei multiple (MCA) şi Clusterizare ierarhică pe componente principale (HCPC) în limbajul de programare R. Studiul este descriptiv, ceea ce se datorează necesităţii de a obţine informaţii empirice care să ofere o imagine holistică a fenomenului studiat şi a elementelor sale structurale.

Au fost identificate patru clustere, fiecare cuprinzând întreprinderi de dimensiuni diferite: 1) întreprinderi care nu au avansat în marketing digital, 2) întreprinderi cu strategii complexe de marketing, dar resurse limitate, 3) întreprinderi care combină metodele tradiţionale şi cele de marketing digital, 4) întreprinderi avansate cel mai înalt în marketing digital. Social media marketing-ul ocupă o poziţie de lider în activităţile de marketing ale afacerilor, indiferent de dimensiunea firmei/companiei. IMM-urile se confruntă cu anumite dificultăţi în activităţile de marketing în general, precum şi în utilizarea instrumentelor de marketing digital.

Cercetările anterioare pe acest subiect sunt foarte limitate, astfel studiul dat este unic prin faptul că examinează problema inclusiv în contextul IMM-urilor şi ţărilor din Europa Centrală şi de Est. S-a demonstrat că IMM-urile, împreună cu companiile mari, pot avea strategii de marketing complexe şi pot folosi cu succes instrumente moderne de marketing digital.

Cuvinte cheie: *marketing digital, marketing antreprenorial, sondaj sociologic*

В данной статье представлены результаты исследования по внедрению цифрового маркетинга на предприятиях Молдовы. На основе социологического исследования, проведенного автором в мае-июне 2023 г. среди предпринимателей (N=131), определяется уровень использования цифрового маркетинга, текущие тенденции и уровень осведомленности о технологиях и инструментах цифрового маркетинга, а также трудности, с которыми сталкиваются предприниматели в использовании инструментов цифрового маркетинга. Данные были обработаны с использованием анализа множественных соответствий (MCA) и иерархической кластеризации основных компонентов (HCPC) на языке программирования R. Исследование носит описательный характер, что обусловлено необходимостью получения эмпирических сведений, дающих целостное представление об изучаемом явлении и его структурных элементах.

Были выделены четыре кластера, каждый из которых включает предприятия разного размера: 1) предприятия, наименее продвинутые в цифровом маркетинге, 2) предприятия со сложной маркетинговой стратегией, но ограниченными ресурсами, 3) предприятия, сочетающие традиционные и цифровые методы маркетинга, 4) наиболее продвинутые в цифровом маркетинге предприятия. Маркетинг в социальных сетях занимает ведущее место в маркетинговой деятельности предприятий независимо от их размера. МСП

сталкиваются с определёнными трудностями в маркетинговой деятельности в целом, и в использовании инструментов цифрового маркетинга в том числе.

Предыдущие исследования по этой теме весьма ограничены, а настоящее исследование уникально тем, что рассматривает вопрос в том числе в контексте МСП и стран Центральной и Восточной Европы. Мы показываем, что МСП, наряду с крупными компаниями, могут иметь сложные маркетинговые стратегии и успешно применять современные инструменты цифрового маркетинга.

Ключевые слова: *цифровой маркетинг, предпринимательский маркетинг, социологический опрос*

INTRODUCTION

Marketing is a living organism that is constantly evolving, and in recent years the digital format has become especially popular in this area. The Covid-19 pandemic has accelerated digital transformation as many companies have been forced to move their businesses online. In the digital world, new features, functions, and platforms are constantly emerging, and customer behavior is also changing. Just as businesses are being forced to adapt to modern reality, digital marketing is also undergoing a transformation.

If entrepreneurs, companies, and organizations do not develop in accordance with modern trends, they risk falling behind their competitors. To be at the peak of success, be in demand among consumers, and grow business, there is a need to pay special attention to the development of digital marketing, which helps to move in the right direction.

Moldova, as a small country with a population of approximately 2.5 million people, possesses a relatively compact market when compared to larger countries. This factor significantly influences business activities. Moreover, Small and Medium-sized Enterprises (SMEs) represent the vast majority of enterprises in Moldova, accounting for roughly 99% of the total enterprises, and employing approximately 65% of the entire salaried.

The small size of the local market presents various challenges for entrepreneurs. First and foremost, it limits growth prospects. With a small market, scaling a business becomes a more intricate endeavor, as companies contend with constrained demand for their products and services, impeding expansion efforts. A compact market intensifies competition, leading to price reductions, diminishing profits, and increased difficulty in distinguishing one's brand from competitors' brands.

To sustain profitability, companies operating within this limited local market often must explore opportunities for exporting to foreign markets. However, reliance on exports also carries risks, such as susceptibility to fluctuating international economic conditions and competition on the global stage. Nonetheless, the small market size also offers certain advantages, including the ability to swiftly adapt to customer needs and shifts in demand, as well as cultivating more personal relationships with customers.

Entrepreneurs in Moldova must prioritize adaptability and seek optimal strategies for thriving within a small market. This could involve the development of high-quality products and services, effective branding, proactive engagement in online sales, and international expansion to broaden their market reach.

Digital marketing plays a key role in expanding a business even in a small market. In an environment of limited resources and a competitive small market, properly planned and effectively executed digital marketing strategies can provide significant benefits. In addition, Internet usage rates in Moldova are quite high, which is a prerequisite for the increased use of digital marketing to promote goods and services. Internet penetration is 61.3% (Datareportal, 2023), the number of users exceeds 2.14 million, the number of social media users is 1.6 million, the number of mobile Internet users exceeded 2.1 million, which is 76% of the total number of connections to mobile broadband Internet services (NRA, 2023).

This study is intended to examine the marketing strategies employed by firms and companies in Moldova, with a particular focus on assessing the extent of promotion within the realm of digital marketing. The study follows a descriptive approach, as it is imperative to gather empirical data that provides a comprehensive understanding of the phenomenon under investigation and its constituent components.

THEORETICAL FRAMEWORKS ON DIGITAL MARKETING

The study is based on two theoretical frameworks: the Resource-Based View (RBV) and Dynamic Capability Theory (DCT), which offer valuable lenses for understanding the dynamics of digital marketing adoption in both small and large businesses. RBV highlights the role of valuable resources in shaping a firm's competitive advantage, including those pertinent to digital marketing.

The RBV (Wernerfelt, 1984) suggests that variations in the utilization of digital marketing by small and large businesses can be elucidated by the resources and capabilities they possess. RBV posits that a firm's competitive advantage is derived from the distinct and valuable resources under its control (Barney, 1996). In the context of digital marketing, resources may encompass technological equipment, knowledge, data, branding, and other assets.

The DCT (Teece et al., 1997) emphasizes a firm's ability to adapt and reconfigure its resources and competencies to thrive in a dynamic environment. Empirical data will assess the practical applicability of these theories and their influence on the development of effective digital marketing strategies in an ever-evolving environment. DCT offers insight into the differences in the adoption of digital marketing by small and large businesses by assessing their capacity to adapt, leverage, innovate, learn, and effectively manage available resources and partnerships. These divergences in capabilities mold digital marketing strategies and, consequently, exert an influence on the competitiveness of businesses. DCT underscores the capacity of firms and companies to attain and sustain a competitive advantage in a dynamic environment through the reconfiguration and integration of their resources and capabilities. It places a significant emphasis on the organization's ability to integrate and reconfigure both internal and external skills, resources, and functional competencies to effectively address swiftly evolving contexts, considering this as a pivotal aspect of dynamic capabilities. DCT postulates that organizations endowed with more robust dynamic capabilities are poised to outperform those with more limited dynamic capabilities. While dynamic capabilities can lead to enhanced organizational performance, it's important to note that companies do not gain a competitive advantage solely by possessing dynamic capabilities but rather by effectively applying and exploiting them. The application of this approach in marketing has given rise to the term "Dynamic Marketing Capabilities" (Bruni & Verona, 2009; Barrales-Molina et. al., 2017; Kwon, 2021; Kim & Lim 2022) and has focused on how organizations develop dynamic capabilities in marketing to effectively adapt to changing market conditions, particularly in the era of digital transformation.

LITERATURE REVIEW

Recent research indicates that digital marketing is extensively employed to promote products or services and engage with consumers through digital channels. However, traditional marketing has not completely lost its importance. According to Kotler et al. (2017), both forms of marketing can exist simultaneously and complement each other. Traditional marketing continues to play an important role in enhancing consumer awareness and generating interest in new products, services, and information technology. With growing interactions, customers communicate more closely with companies, and the need for digital marketing increases. The research shows that combining classical and digital marketing capabilities has a positive influence on firm profitability when customer orientation is high (Homburg & Wielgos, 2022).

The objective of contemporary marketing is to, through the implementation of marketing strategies tailored to the nuances of the industry, establish closer connections with consumers and make a timely transition from traditional marketing methods to digital ones.

Nowadays, there are certain differences in marketing strategies between small and large businesses, and the use of digital marketing is usually driven by resources and goals. Despite evidence that digital marketing can improve the performance of SMEs, including increasing sales (Cenamor et al., 2019; Becker & Schmid, 2020; Inayatulloh et al., 2023), adoption of digital marketing tools remains low (Quinton et al., 2018; Canhoto et al., 2021). This is typically attributed to insufficient marketing budgets, which limits the ability of SMEs to use expensive digital marketing tools and channels (Nordin et al. 2023). The complexity of digital platform adoption and the uniqueness of entrepreneurial SMEs, along with a lack of capabilities or inertia, can hinder the advancement of digital marketing (Cenamor et al., 2019). However, a number of studies show that SMEs can be quite advanced in digital marketing, using the latest tools and reaping all sorts of benefits from their use (Cenamor et al., 2019; McCartan, 2023; Saura et al, 2023)

Large firms/companies can allocate significant resources to digital marketing, enabling them to employ more robust and expansive strategies. Literature analysis indicates

that the nature of marketing activities is determined by the target audience. Since SMEs often cater to a niche audience, their digital marketing strategies often concentrate on local markets and a close audience. On the other hand, large businesses, with a broader target audience, utilize more diverse and intricate marketing strategies. They also have more resources for integrating various channels, including content marketing, paid advertising, mobile apps, and many others. Small businesses mainly rely on social networks, email marketing, and search engine optimization. Undoubtedly, one of the significant advantages of large businesses is their more sophisticated analytics systems and broader teams for measuring and analyzing the effectiveness of marketing campaigns. In contrast, small businesses have limited access to analytical resources and may rely on simpler methods of measuring success (Rizvanović et al., 2023).

Belas et al. (2022) demonstrated, using the example of Visegrád Group countries, that the use of digital marketing depends on the industry of SMEs. Online marketing tools are predominantly used in the entertainment, tourism, and service sectors, while they are less frequently employed in agriculture, construction, and transportation services.

Additionally, the literature points out that there are two types of marketing strategies: professional and amateur. Professional marketing is pursued by enterprises that have the need and resources for it. If the enterprise is large and structured in an impersonal and hierarchical manner, the necessary metrics will be established. Amateur marketing is undertaken by those who lack the resources or need for extensive marketing efforts. These two types correspond to large enterprises and small to medium-sized businesses, respectively. Moreover, this distinction is observed both in Western and Eastern European countries (Bachev, 2004; Bodlaj & Rojšek, 2014; McCartan, 2023; Setkute & Dibb, 2022). Among SMEs, it often boils down to fleeting tactics, haphazardly devised by the owner or manager, with a greater focus on relationship building oriented toward profit generation and non-market factors. However, small enterprises can compensate for resource limitations by finding their niche (Moen, 2000) and/or by swiftly responding to innovations (Bengtsson et al., 2007). Bengtsson et al. (2007) also note that concerning marketing innovations, medium-sized businesses are in a more challenging position, as they tend to be more cautious due to prior investments (which small businesses often didn't make) and lack the resources available to large enterprises.

A number of studies show that SMEs do not sufficiently use the potential of digital marketing; business managers are often insufficiently knowledgeable in this area and do not understand the essence and nature of communication in the digital environment (Taiminen & Karjaluoto, 2015).

Thus, the literature, on the one hand, confirms the dichotomous assumption (advanced and complex marketing in large enterprises, underdeveloped marketing in SMEs); on the other hand, it indicates that micro-enterprises and small businesses can, in fact, aggressively implement innovative practices.

The research shows that in transition economies, the impact of using digital marketing is similar to that of developed countries: ”it enhances promotion, increases brand awareness, and improves positioning. This strengthens companies' competitiveness through the development of various forms of electronic services and electronic business” (Melović et al., 2020). Despite the numerous studies dedicated to digital marketing, there has been no research of this kind conducted in Moldova, a country with an emergent economy. However, analyzing the impact of a factor such as company size on digital marketing is of particular importance as it allows us to identify the specific challenges and difficulties entrepreneurs face in utilizing digital marketing tools. Our research aims to fill these gaps. Furthermore, this study contributes to identifying differences in the approaches of firms/companies depending on their size, including the specifics of using digital marketing tools by SMEs.

What is happening in the Moldovan business landscape, and how are entrepreneurs adapting to the latest marketing trends? How does the marketing activity of companies differ based on their size? How have SMEs progressed in utilizing digital marketing tools? Based on these questions, the conceptual research model is founded on the following hypothesis.

The size of a company significantly influences the level of advancement in digital marketing, including the use of digital marketing tools, methods of measuring results, and the presence of specialists responsible for marketing activities.

Working hypotheses:

H1 The larger the company, the more complex the marketing strategy, and conversely, SMEs tend to have a fragmented approach to marketing or a lack of marketing altogether.

H2 There is a negative correlation between the small size of a company and the use of digital marketing tools.

H3 SMEs prefer social media and local channels (e.g., bulletin board 999.md), while large enterprises use a more diverse range of marketing channels.

H4 Large enterprises employ complex digital marketing strategies, exhibiting greater flexibility in utilizing various tools.

H5 The lack of qualified personnel hinders progress in the field of digital marketing. This hypothesis has been put forward additionally, since Moldova, due to the high level of emigration in many areas, faces a shortage of personnel, especially qualified.

RESEARCH METHODOLOGY

To achieve the set goal, a sociological survey was conducted in May and June 2023 using the specialized QuestionPro platform. To determine the research sample, the online Yellowpages of Moldova database (https://www.yellowpages.md/companies/list/) which contains information about firms/companies in Moldova was utilized. This website assisted in establishing a list of firms/companies, along with their email addresses and phone numbers. Existing filters on the website allowed for the compilation of a list of companies by industry and location. Furthermore, the websites of companies/firms were examined to ensure the representativeness of small, medium, and large enterprises. Consequently, the units of the sample were firms/companies, from which 2100 units were randomly selected. Emails (the survey) were sent with a cover letter explaining the purpose of the study and clearly mentioning that participation in the study was voluntary to the owners and managers of firms/companies, requesting them to respond to the survey questions. Respondents were also guaranteed that their responses would be anonymous and would be used for academic research purposes only. In some cases, email delivery failed due to invalid email addresses, possibly because the company had ceased to exist or changed its address. Since the response rate to the survey after sending emails was low, it was necessary to resort to phone calls to request survey completion. In this case, there were also some invalid phone numbers. As a result, we obtained 312 survey views and only 131 completed surveys, which were used for analysis.

To study marketing strategies based on the size of the enterprise, the key variable was the distribution by the size of the enterprise (Table 1).

Table 1.
Distribution of observations by enterprise size

Enterprise size	Type of enterprise	Cod	Frequency	Share, %
Up to 9 people	micro	1	57	44
10 – 49	small	2	34	26
50 – 249	medium	3	19	15
250 people and more	big	4	21	16
Total			**131**	**100**

The vast majority of variables are binary. From all the survey questions, those that address the following aspects were selected:

1. Organization of marketing and the role of the firm/company owner in marketing activities. Based on the reviewed literature, the assumption was made that in small enterprises, marketing would be managed by the owner or not managed at all. In contrast, in large businesses, there would be a specialized marketing department or specialist.

2. Questions about "What do you expect from marketing activities?". Assumption: the larger the enterprise, the more complex the requirements should be.

3. Tools used. Questions include: "What marketing channels do you use to promote your company/products?" and "What tools does your firm/company use to assess the effectiveness of marketing activities?".

4. Questions about the challenges that entrepreneurs face in their marketing activities.

The smallest category consists of 19 (15%) observations and the second rarest consists of 21 (16%). In this context, the use of the Chi-square test may be challenging. Chi-square tests that should be taken with caution are marked with an asterisk, and Fisher's exact test is also used as an additional tool. In both cases, the null hypothesis is the absence of a connection, and when the null hypothesis is rejected, it can be said that companies of different sizes indeed employ different marketing strategies. However, Fisher's exact test is not applied to tables where both sides are greater than two (as is the case with multiple-choice questions, from which one option needs to be selected). The results of the tests do not significantly differ by the two methods.

The third part used the reverse method: first, the entire sample was divided into types, and then the distribution of types by business size was analyzed. MCA and HCPC were used for this (Husson et. al., 2023). The HCPC method "combines three main methods for analyzing multivariate data, namely Principal Component Analysis (PCA), hierarchical clustering, and the k-means method" (Koh et al., 2022). In the first stage of the MCA-HCPC analysis, dimensionality

is reduced: variables with the highest and lowest correlations and their eigenvectors are identified. Then, variable by variable, criteria are defined to achieve maximum homogeneity within groups (Husson et. al., 2023). Calculations were done in R 2023.03.1 using the missMDA and FactoMineR packages (Husson et. al., 2023; Josse &Husson, 2016).

With the help of MCA, 66 eigenvectors were identified. The two most significant vectors explain 14.5% and 5.7% of the variance. The largest contributions to the first vector were responses related to the use of conversion analysis (2.9%), the use of any tools for evaluating marketing effectiveness (2.7%), and content marketing (2.7%). The largest contributions to the second vector were the absence of sales increase as a goal (4.9%) and not using television advertising (4.6%). Figure 1 shows the dispersion of all 131 observations in the space of these two eigenvectors, which helped identify the corresponding clusters.

Figure 1.

Arrangement of questionnaires and clusters according to the two most explanatory eigenvectors obtained using MCA

LIMITATIONS OF THE STUDY

This study has several limitations that are important to mention. Online surveying was chosen as a suitable method, which is both efficient and fast and does not require significant financial resources. However, a limitation is that not all small and medium-sized enterprise (SME) managers regularly check their email, which affected the size of the achieved sample. It is also necessary to mention the limitation of self-completed questionnaires. It often happens that respondents do not understand or misinterpret the questions. Some respondents (entrepreneurs) are discouraged from participating in the survey because they do not always want to openly answer questions related to their business. This is indicated by the number of questionnaire views, which is almost three times larger than the number of respondents who completed them.

MAIN RESULTS

DESCRIPTIVE STATISTICS

Regarding the organization of marketing activities, some uneven distribution of responses is noted (in this regard, the Chi-square and Fisher's exact tests are not applicable). Among microenterprises, more often than not, nobody is involved in marketing; however, there are those who employ both in-house (8) and outsourced (1) marketers (Table 2). In a microenterprise, defined as having fewer than ten employees, the inclusion of a dedicated marketer is of interest; this contrasts with large businesses where the company's leader often takes on the role of marketing.

Table 2.
Frequency distribution of answers to the question "How are marketing activities organized in your firm/company?"

	Enterprise size			
Possible answer	micro	small	medium	large
There is a marketer on staff	8	6	2	2
We use the services of a third-party marketer	1	0	0	4
Marketing is carried out by the head of the firm/company	10	10	10	14
Nobody does marketing	32	13	5	1
Other, please specify what exactly	6	5	2	0

The most significant differences were found in planning and marketing methods. What's interesting is the common ground shared by businesses of different sizes: everyone utilizes mobile and email marketing, advertising on social networks, messengers, and classified ads. Statistical tests did not reveal significant differences in the following areas:

- The role of the owner of the firm in marketing the enterprise.
- Modern digital technologies - except for some, more commonly used by larger enterprises, such as IoT, Big Data, and chatbots. Some tools are equally used by all (e.g., cloud services), while others are not used by anyone (like Blockchain).
- Differences in the problems faced by firms were evaluated differently by various methods. Notably, budget-related issues, which are more pronounced for small enterprises, as well as the likelihood of data leaks.

Detailed descriptive statistics are presented in the Appendix, Tables 1-4.

CLUSTERING OF ENTERPRISES DEPENDING ON THE TYPE OF MARKETING STRATEGY

The research identified four clusters based on the marketing strategies employed. First and foremost, two distinct poles stand out: Cluster 1 *(enterprises less advanced in digital marketing)* and Cluster 4 *(the most advanced enterprises in digital marketing)*. Representatives in the first cluster are largely disengaged from marketing or have a general involvement, which is reflected in the structure of the digital technologies and marketing channels they use. Representatives in the most advanced cluster often use complex tools more frequently than others and are often dissatisfied with the results. Clusters 2 *(complex marketing with limited resources)* and 3 *(enterprises with complex marketing strategies but limited resources) and 3 (enterprises that combine traditional and digital marketing methods)* can be positioned between these two poles, but they fundamentally adopt two different approaches, which seemingly reflect differences in their sizes.

According to Table 5 (Appendix), microenterprises and small businesses make up the majority in clusters 1 and 2. In cluster 3, on the contrary, large businesses have

the majority, and in cluster 4 all four categories are most evenly distributed.

The predominance of companies with fewer than fifty employees is explained by sample characteristics. However, the data align with previous research indicating that small and medium-sized businesses, for the most part, may lag behind large enterprises but can identify and attempt to leverage their advantages.

Cluster 1, *enterprises less advanced in digital marketing,* consists of 46 firms/companies (35% of the sample).

In these firms/companies, the role of a marketer is less prominent, with owners often taking on this responsibility or no one being specifically responsible for marketing (this cluster includes almost all enterprises where no one is responsible for marketing). About 20% of the cluster has utilized the services of marketing firms.

In this cluster, expectations from marketing activities are low or undefined. They less frequently utilize all the marketing channels listed, and modern technologies are used less frequently compared to other clusters (57% versus 0-24% in other clusters). The most popular marketing channel is social media (59%), followed by advertising on classified ad websites (43%), such as the Moldovan website 999.md. The next popular channel is leaflets, used by one-fifth of the cluster. Only in this cluster are there firms/companies that do not use any marketing channels. Notably, there are firms in this cluster that do not use any marketing channels, suggesting a lack of awareness or resources to engage in promotional activities. Representatives of firms/companies in this cluster often complain about a lack of budget (43%).

Cluster 2, *enterprises with complex marketing and limited resources,* comprises 47 firms/companies (36% of the sample).

This cluster is predominantly made up of micro and small enterprises, but a few large firms/companies are also included. While this cluster does not possess the resources of clusters 3 and 4, it does have a marketing presence, and in some aspects, it employs more complex marketing methods than cluster 3. In this cluster, marketing is still often handled by the firm's leader (47%), but more frequently than in cluster 1, the firm/company hires an in-house marketer (32%) or an outsourced employee (17%). Like cluster 1, this cluster also encounters budget constraints and a knowledge deficit, but to a lesser extent than clusters 3 and 4 (around 40% for the first two compared to 20% for the others). One informant wrote, "There is not enough time for everything. I am the leader and oversee all types of activities."

Representatives of this cluster are more advanced in some modern technologies than those in clusters 1 and 3 (including cloud services and neural networks), but they do not employ more advanced technologies (such as the Internet of Things, Big Data, process automation, etc.). They often (again, less than Cluster 4 but more than Clusters 1 and 3) identify problems with employee qualifications and express dissatisfaction with marketing results. They most frequently use social media (94%) and advertise on classified ad websites (55%), sometimes venturing into more complex tools (SEO 45%, PPC 30%, video marketing 30%).

Cluster 3, *enterprises that combine traditional and digital marketing methods, comprises 21 firms/companies* (16% of the sample).

In this cluster, more than half are large firms/companies, but representatives of SMEs are also included. In these firms, marketing is more frequently managed by someone other than the owner (72%). However, they more often declare that the owner sets the direction of development (100%) and oversees the results (57%). There is a higher demand for marketers in this cluster (Table 9), and at the same time, representatives of this cluster are more satisfied with the results compared to clusters 2 or 4. This cluster includes the overwhelming majority of Moldovan large enterprises surveyed (with a staff of 250 or more people), typically well-established in both the domestic and international markets, and whose trade brands are fairly well-known.

This cluster, more than others, utilizes classical and non-budget-friendly marketing channels: video marketing (81%), TV advertising (76%), radio (67%), and billboards (62%). However, they don't limit themselves to these and also reach customers through social networks (95%), leaflets (71%), partnerships (57%), and more. Some companies in Cluster 3 engage in complex internet channels: SEO (43%), PPC (43%), and email marketing (37%) - however, with resources available, they do not strive to use modern technologies (the most common are cloud services (43%) and neural networks (14%). It is noteworthy that 33% had difficulty answering the question about modern technologies, and 24% admitted not using any. Compared to the first cluster, in which 57% of respondents admitted not using any modern

technologies and only 7% had difficulty answering, in cluster 3, around a third of respondents had difficulty answering, possibly due to a reluctance to admit lagging behind.

Cluster 3 more frequently employs complex modern technologies, including robotics (71% compared to 2-15% in other clusters), machine learning (47% compared to 0-4% in other clusters), etc. Among their channels, they also emphasize the internet, including search advertising (88%) and search engine optimization (82%), less frequently using radio and TV (29%) and leaflets (53%).

Cluster 4, *the most advanced enterprises in digital marketing, consists of 17 firms/ companies* (13% of the sample).

These enterprises also do not face budgetary problems (18%) or knowledge deficits in digital marketing (18%), but they more often than others experience a shortage of qualified personnel (88%). One respondent complained not only about in-house staff but also about outsourced marketers: "The competence of outsourcing specialists is minimal compared to the in-house team." Nevertheless, this cluster more frequently than others sought the services of marketing firms. These firms have higher expectations compared to others, citing challenges such as a small audience, low conversion rates, and the ineffectiveness of advertising campaigns. Compared to cluster 3, this cluster sets fewer goals and evaluates the results less positively.

Detailed data related to clusters are presented in the Appendix. Tables 5-10.

CONCLUSIONS

This research yielded the following findings: the impact of enterprise size on marketing strategies, including the use of digital marketing tools, was examined. In line with previous studies, it was assumed that micro, small, and medium-sized enterprises, due to resource constraints, would be less advanced in the use of digital marketing tools (H1 and H2). This hypothesis was partially confirmed. On one hand, a significant number of SMEs were categorized into the cluster of less advanced firms/companies. This result aligns with the Resource-Based View, which emphasizes how resource constraints can influence an organization's strategic decisions and capabilities. On the other hand, a certain portion of SMEs placed significant importance on marketing activities (cluster 2 - complex marketing with limited resources) and used relatively advanced digital marketing tools such as SEO, PPC, and video marketing. This adaptation showcases resourcefulness within constraints, a principle of the Resource-Based Theory. The research findings underscore the relevance of Dynamic Capability Theory by highlighting how enterprises, especially SMEs, leverage adaptability, innovation, and knowledge to navigate challenges in digital marketing. The theory's emphasis on organizational learning, flexibility, and resource reconfiguration aligns with the observed variations in digital marketing strategies among enterprises of different sizes in Moldova.

The research identified the peculiarities of the marketing strategy of large enterprises in Moldova. Confirmation was found for H3 and H4, which suggests that large enterprises employ a more diverse range of marketing channels. In addition to popular digital marketing channels like social networks, large firms/ companies extensively use traditional, more expensive channels such as television and radio advertising, billboards, leaflets, and business cards. For large firms, it's important to reach a broader audience, which may not always be active on social networks. Therefore, they utilize traditional channels to reach their target audience, which might not always be reached through digital channels. Expensive traditional channels are used to maintain and strengthen their brand and market status, giving the company a more serious and significant image. This indicates that large companies recognize the importance of combining different marketing channels, including traditional ones, even when digital alternatives are available. They aim to diversify their marketing efforts to achieve maximum impact and cater to the needs of various segments of their audience.

The study found that social media is the most commonly used form of digital marketing. In all clusters, except the first, the share of those using social networks reaches almost 90%. This is in line with previous research (Melović et al., 2020; Nadanyiova et al., 2021; Inayatulloh et al., 2023). At the same time, advertising on the Internet on the 999.md board is also the most used tool. Google analytics, social media metrics analysis, and traffic analysis were the most common ways to measure digital marketing effectiveness in all clusters, excluding the first (*enterprises less advanced in digital marketing*). About half of enterprises in the first cluster do not analyze the effectiveness of marketing activities.

The utilization of diverse marketing channels (H4) by large enterprises aligns with the notion of dynamic

capabilities. These firms, by employing both traditional and digital channels, demonstrate flexibility in their marketing approaches. Dynamic Capability Theory emphasizes that firms need to possess the flexibility to reconfigure resources and activities in response to changing market conditions. Large enterprises employing multiple marketing channels exhibit this flexibility, ensuring they can adapt their strategies to reach different segments of their audience and maintain a robust brand presence.

The hypothesis that "A shortage of qualified personnel hinders progress in the field of digital marketing" was fully confirmed (H5). This issue was more frequently mentioned by representatives of large businesses, who also critically evaluated the services of specialized marketing companies (cluster 4). These firms/companies do not face problems with budgeting for marketing activities and are advanced in digital marketing; they can finance marketing research and campaigns. However, despite this, they often encounter the problem of a shortage of qualified employees because they have high standards of quality and personnel requirements. They face issues such as a small audience and low conversion rates, indicating that they set high goals but encounter real challenges in achieving them. Consequently, these companies face challenges in personnel management and achieving high marketing objectives.

The study revealed the challenges that businesses in Moldova face in their marketing activities. The most indicative aspect in this regard is the proportion of enterprises belonging to the first cluster, comprising more than a third of the entire sample, which is the least advanced in digital marketing, the vast majority being micro and small enterprises. Representatives of SMEs more frequently pointed out the lack of resources (personnel, finances, time) as a significant challenge. These difficulties are also characteristic of medium and some large businesses, which may be related to bureaucratic constraints, a lack of flexibility in resource management, and the complexity of implementing changes.

Overall, this research highlights the need for greater support for SMEs in the implementation of digital marketing, which can be part of a broader strategy to encourage the digital transformation of small and medium-sized enterprises. Attention should be directed towards improving the training of professionals in marketing and entrepreneurship, providing accessible and high-quality educational programs, and offering consultations in the field of digital marketing.

APPENDIX

I. DESCRIPTIVE STATISTICS

Table 1.

Expectations of entrepreneurs from marketing activities depending on the size of enterprises

Possible answer	P-value, Chi-square	P-value, Fisher	% of enterprises that responded positively			
			micro	small	medium	large
Attracting new customers and increasing sales*	0.187	0.205	84	85	100	95
Retention of existing clients	<0.001	<0.001	54	47	47	100
Increasing brand awareness	0.007	0.005	54	62	84	90
Market expansion, for example, through the launch of new products or services	<0.001	<0.001	32	47	68	90
Improving the image of the company/company	0.012	0.01	47	50	68	86
Increased sales	<0.001	<0.001	42	53	79	90
Increased profits	0.001	<0.001	47	38	58	90
Improving conversions on a website or online store	0.009	0.01	19	24	47	52
Increasing market share	<0.001	<0.001	19	32	58	71

Table 2.

Tools used by the firm/company to assess the effectiveness of marketing activities

Possible answer	P-value, Chi-square	P-value, Fisher	% of enterprises that responded positively			
			micro	small	medium	large
External analytical systems such as Google Analytics, Yandex Metrika	0,117	0,119	46	50	53	76
Traffic analysis	0,049	0,051	30	32	47	62
Conversion Analysis	0,017	0,015	32	18	53	52
CRM systems	0,003	0,004	23	24	47	62
Customer surveys	0,057	0,056	37	18	32	52
Social media metrics analysis	0,013	0,014	33	32	47	71
ROi analysis *	0,003	0,003	11	9	37	38
We do not use any *	0,153	0,149	19	29	16	5
Difficult to answer *	0,252	0,275	4	3	5	14

Table 3.

Marketing channels used to promote the company/products/services

Possible answer	P-value, Chi-square	P-value, Fisher	% of enterprises that responded positively			
			micro	small	medium	large
Advertising on trading platforms and message boards such as 999.md, etc.	0.26	0.267	54	41	32	38
Leaflets, business cards	0.004	0.004	26	41	47	71
TV ads *	<0.001	<0.001	9	18	21	62
Radio advertising *	<0.001	<0.001	12	24	32	57
Advertising on street billboards	0.004	0.007	19	18	32	57
Search Engine Optimization (SEO)	0.082	0.084	26	38	42	57
Search advertising (PPC)	<0.001	<0.001	19	24	42	71
Social networks (Facebook, Instagram, Twitter, LinkedIn, etc.) *	0.334	0.308	77	79	79	95
Email Marketing *	0.067	0.058	14	24	37	38
Mobile marketing (mobile applications, SMS mailings) *	0.352	0.341	12	15	21	29
Video marketing (YouTube, Vimeo, etc.)	<0.001	<0.001	23	26	42	71
Content marketing (blogs, articles, infographics, etc.)	0.002	0.003	18	18	37	57
Affiliate marketing (collaboration with partners)	0.006	0.007	19	21	37	57
Advertising in instant messengers (WhatsApp, Viber, Telegram, etc.)*	0.028	0.036	9	18	5	33
Advertising on forums and communities *	0.063	0.064	9	15	21	33
None *	0.336	0.462	5	9	0	0

Table 4.
Share of firms/companies that have sought the services of specialized marketing firms over the past 12 months

Possible answer	micro	small	medium	large
Used the services of marketing firms	19	8	8	13
Have not used the services of marketing firms	38	26	11	8
Chi-square statistics	8.8042			
P-value, Chi-square	0.03201			
P-value, Fisher's exact test	0.03462			

II. CLUSTERING OF ENTERPRISES DEPENDING ON THE TYPE OF MARKETING STRATEGY

Table 5.
Frequency of enterprises of different sizes by cluster

Enterprise size	Clusters			
	1 less advanced	2 complex marketing with limited resources	3 combining traditional and digital marketing channels	4 most advanced
Up to 9 people	23	26	4	3
10 – 49	18	13	1	2
50 – 249	4	7	3	6
250 and more	1	3	13	6

Table 6.
Enterprises by marketing organization and by cluster, %

Possible answer	1	2	3	4
There is a marketer on staff	17	32	67	41
We use the services of a third-party marketer	7	17	5	18
Marketing is carried out by the head of the company/company	48	47	19	18
Nobody does marketing	28	4	0	6
Other	0	0	10	18

Table 7.

Share of enterprises in the cluster that expressed this expectation from marketing, %

Possible answer	1	2	3	4
Attracting new customers and increasing sales volume	76	94	100	94
Retention of existing clients	43	53	95	71
Increasing brand awareness	39	68	100	94
Market expansion, for example, through the launch of new products or services	30	43	95	71
Improving the image of the company/company	41	53	90	71
Increased sales	43	51	100	65
Increased profits	35	53	86	65
Improving conversions on a website or online store	7	26	71	53
Increasing market share	15	32	81	53
I find it difficult to answer	4	0	0	0

Table 8.

Share of enterprises in the cluster using the listed marketing channels, %

Possible answer	1	2	3	4
Advertising on trading platforms and message boards such as 999.md, etc.	43	55	33	35
Leaflets, business cards	20	43	71	53
TV ads	2	13	76	29
Radio advertising	11	19	67	29
Advertising on street billboards	13	19	62	41
Search Engine Optimization (SEO)	9	45	43	82
Search advertising (PPC)	9	30	43	88
Social networks (Facebook, Instagram, Twitter, LinkedIn, etc.)	59	94	95	88
E-mail Marketing	0	26	38	65
Mobile marketing (mobile applications, SMS mailings)	4	17	10	59
Video marketing (YouTube, Vimeo, etc.)	4	30	81	71
Content marketing (blogs, articles, infographics, etc.)	2	23	52	71
Affiliate marketing (collaboration with partners)	7	23	57	65
Advertising in instant messengers (WhatsApp, Viber, Telegram, etc.)	7	9	29	35
Advertising on forums and communities	0	13	43	35
None	13	0	0	0

Table 9.

Share of enterprises using the specified methods for assessing efficiency, by clusters, %

Possible answer	1	2	3	4
External analytical systems such as Google Analytics, Yandex Metrika	20	68	62	88
Traffic analysis	9	43	57	82
Conversion Analysis	0	43	48	88
CRM systems	2	40	48	76
Customer surveys	13	43	43	53
Social media metrics analysis	15	47	52	82
ROi analysis *	0	15	33	59
We do not use any *	52	2	0	0
Difficult to answer *	7	0	19	0

Table 10.
Share of enterprises in the cluster experiencing the listed difficulties, %.

Possible answer	1	2	3	4
Not enough budget	43	38	19	18
Not enough qualified employees	35	60	48	88
Not enough effective marketing campaigns	9	32	14	18
Lack of understanding of the market and audience	17	21	0	18
Insufficient audience (insufficient number of visitors to the website or social networks)	2	21	19	41
Low level of conversion (actions, reactions, filling out the feedback form, etc.)	2	32	14	47
Insufficient effectiveness of advertising campaigns	7	15	10	35
Insufficient data protection (confidential information leaks)	0	2	0	12
Lack of knowledge in the field of digital marketing (difficulties in choosing promotion channels, creating advertising materials, etc.)	35	34	14	18
Other	13	4	38	6
We have no problems	0	2	0	6

REFERENCES

Bachev, H. (2004). Governing of Marketing in Bulgarian Farms. Available at SSRN Electronic Journal. https://doi.org/10.2139/ssrn.903505

Barney, J. B. (1996). The resource-based theory of the firm. *Organization science,* 7(5), 469-469. https://doi.org/10.1287/orsc.7.5.469

Barrales-Molina, V., Martínez-López, F. J., & Gázquez-Abad, J. C. (2017). Dynamic Marketing Capabilities: An Integrative Framework Proposal to Absorb and Manage Market Knowledge. In *Developments in Marketing Science: Proceedings of the Academy of Marketing Science* (pp. 176–176). Developments in Marketing Science: Proceedings of the Academy of Marketing Science. https://doi.org/10.1007/978-3-319-50008-9_45

Becker, W., & Schmid, O. (2020). The right digital strategy for your business: an empirical analysis of the design and implementation of digital strategies in SMEs and LSEs. *Business Research*, 13, 985–1005. https://doi.org/10.1007/s40685-020-00124-y

Belas, J., Gavurova, B., Novotna, L., & Smrcka, L. (2022). Examination of differences in using marketing tools in the management of SMEs in the Visegrád Group countries. *Amfiteatru Economic*, 24(60), pp. 447-463. https://doi.org/10.24818/EA/2022/60/447

Bengtsson, M., Boter, H., & Vanyushyn, V. (2007). Integrating the Internet and Marketing Operations: A Study of Antecedents in Firms of Different Size. *International Small Business Journal,* 25(1), 27-48. https://doi.org/10.1177/0266242607071780

Bodlaj, M., & Rojšek, I. (2014). Marketing in Small Firms: The Case of Slovenia. *Economic and Business Review,* 16(2). https://doi.org/10.15458/2335-4216.1274

Bruni, D. S., & Verona, G. (2009). Dynamic marketing capabilities in science-based firms: an exploratory investigation of the pharmaceutical industry. *British Journal of management, 20,* S101-S117. https://doi.org/10.1111/j.1467-8551.2008.00615.x

Canhoto, A. I., Quinton, S., Pera, R., Molinillo, S., & Simkin, L. (2021). Digital strategy aligning in SMEs: a dynamic capabilities perspective. *The Journal of Strategic Information Systems, 30*(3), 101682. https://doi.org/10.1016/j.jsis.2021.101682

Cenamor, J., Parida, V., & Wincent, J. (2019). How entrepreneurial SMEs compete through digital platforms: The roles of digital platform capability, network capability and ambidexterity. *Journal of Business Research,* 100, 196-206. https://doi.org/10.1016/j.jbusres.2019.03.035

Datareportal (2023) Digital 2023: Moldova https://datareportal.com/reports/digital-2023-moldova

Homburg, C., & Wielgos, D.M. (2022) The value relevance of digital marketing capabilities to firm performance. *Journal of the Academy of Marketing Science,* 50, 666–688. https://doi.org/10.1007/s11747-022-00858-7

Husson, F., Josse, J., & Pages, J. (2010). Principal component methods - Hierarchical clustering -Partitional clustering: why would we need to choose for visualizing data? *Technical Report of the Applied Mathematics Department (Agrocampus)* http://www.sthda.com/english/upload/hcpc_husson_josse.pdf

Husson, F., Josse, J., Le, S., & Mazet, J. (2023). Package FactoMineR [Computer software]. http://factominer.free.fr

Inayatulloh et al., (2023). The effect of using mobile applications, using social media, using E-Commerce, and having IT Knowledge on the performance of SMEs. *International Conference on Information Management and Technology (ICIMTech)*, Malang, Indonesia, 2023, pp. 621-626, https://doi.org/10.1109/ICIMTech59029.2023.10277907

Josse, J., & Husson, F. (2016). missMDA: A package for handling missing values in vultivariate data analysis. *Journal of Statistical Software, 70*(1), 1–31. https://doi.org/10.18637/jss.v070.i01

Kim, K., & Lim, G.G. (2022). International Dynamic Marketing Capabilities of Emerging-Market Small Business on E-commerce. *Preprints*. https://doi.org/10.20944/preprints202110.0068.v2

Koh, K.-Y., Ahmad, S., Lee, J., Suh, G.-H., & Lee, C.-M. (2022). Hierarchical Clustering on Principal Components Analysis to Detect Clusters of Highly Pathogenic Avian Influenza Subtype H5N6 Epidemic across South Korean Poultry Farms. *Symmetry*, 14(3), 598. https://doi.org/10.3390/sym14030598

Kotler, P., Kartajaya, H., & Setiawan, I. (2017). Marketing 4.0. Moving from Traditional to Digital. Hoboken: John Willey & Sons.

Kwon, Y. (2021) Impacts of Dynamic Marketing Capabilities on Performance in Exporting. *Open Journal of Business and Management*, 9, 2119-2135. https://doi.org/10.4236/ojbm.2021.95112

McCartan, A. (2023). Marketing and performance in small firms: the role of networking. *Journal of Research in Marketing and Entrepreneurship, 25*(1), 150-182. https://doi.org/10.1108/JRME-01-2022-0007

Melović, B., Jocović, M., Dabić, M., Vulić, T. B., & Dudic, B. (2020). The impact of digital transformation and digital marketing on the brand promotion, positioning and electronic business in Montenegro. *Technology in Society, 63*, 101425. https://doi.org/10.1016/j.techsoc.2020.101425

Moen, Ø. (2000). SMEs and International Marketing: Investigating the Differences in Export Strategy Between Firms of Different Size. *Journal of Global Marketing, 13*(4), 7–28. https://doi.org/10.1300/J042v13n04_02

Nadanyiova, M., Majerova, J., & Gajanova, L. (2021). Digital marketing as a source of competitive advantage: case study of Slovak Republic. *Marketing and Management of Innovations, 4,* 92-103. https://doi.org/10.21272/mmi.2021.4-08

Nordin, N., Samsudin, M., & Yusoff, Y. (2023). Social Networking Using Social Media for Small Enterprises: Strategies, Challenges and Measure of Success. *International Journal of Advanced Research in Economics and Finance, 5*(1), 28-39. Retrieved from https://myjms.mohe.gov.my/index.php/ijaref/article/view/21652

NRA (2023) National Regulatory Agensy for Eelectronic Communication and Information Tehnology of the Republic of Moldova. Retrieved from https://en.anrceti.md/news_130922

Quinton, S., Canhoto, A., Molinillo, S., Pera, R., & Budhathoki, T. (2018). Conceptualising a digital orientation: antecedents of supporting SME performance in the digital economy. *Journal of Strategic Marketing, 26*(5), 427-439. https://doi.org/10.1080/0965254X.2016.1258004

Rizvanović, B., Zutshi, A., Grilo, A., & Nodehi, T. (2023). Linking the potentials of extended digital marketing impact and start-up growth: Developing a macro-dynamic framework of start-up growth drivers supported by digital marketing. *Technological Forecasting and Social Change, 186*(A), 122128. https://doi.org/10.1016/j.techfore.2022.122128

Saura, J. R., Palacios-Marqués, D., & Ribeiro-Soriano, D. (2023). Digital marketing in SMEs via data-driven strategies: Reviewing the current state of research. *Journal of Small Business Management, 61*(3), 1278-1313. https://doi.org/10.1080/00472778.2021.1955127

Setkute, J., & Dibb, S. (2022). "Old boys' club": Barriers to digital marketing in small B2B firms. *Industrial Marketing Management, 102,* 266–279. https://doi.org/10.1016/j.indmarman.2022.01.022

Taiminen, H. M., & Karjaluoto, H. (2015). The usage of digital marketing channels in SMEs. *Journal of small business and enterprise development, 22*(4), 633-651. https://doi.org/10.1108/JSBED-05-2013-0073

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509-533. https://www.jstor.org/stable/3088148

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal, 5*(2), 171-180. http://www.jstor.org/stable/2486175

INFLATION SURGE OF 2021-2023 AND MONETARY POLICY IN EASTERN EUROPEAN COUNTRIES

DOI: https://doi.org/10.36004/nier.es.2023.1-08
JEL classification: E31, E52, E60, F01
UDC: 338.23:336.74+336.748.12](4)

Andrei PASLARI,

PhD Student, Academy of Economic Studies of Moldova

https://orcid.org/0000-0001-9426-4231
e-mail: andrei.paslari@gmail.com

Received 22 February 2023
Accepted for publication 7 June 2023

SUMMARY

This article provides an in-depth analysis of the current global economic landscape, with a particular focus on Moldova, Ukraine, Romania, and Poland. The scope of this article is to examine central banks' responses to the challenges posed by 2021-2023 inflation. The research employs a combination of scientific methods, including empirical analysis and quantitative research. It utilizes data from reputable sources like the World Bank, National Banks, and National Bureaus of Statistics to examine various economic indicators. Statistical software R is used for data analysis, including Cross-Correlation Function (CCF) analysis.

In response to rising inflation, Moldova and Ukraine raised interest rates significantly. Moldova later eased rates gradually, while Ukraine maintained a high rate to safeguard its currency. Romania and Poland, with stronger economies, saw milder rate hikes and less inflation increase compared to other Eastern European nations, adopting a cautious and delayed approach and still didn't reduce their base rates.

A critical aspect of the research is the implementation of cross-correlation function (CCF) analysis, which is used to explore the time-lagged correlations between different economic variables, such as the Base policy rate, Commodity price index and IPC. The analyses conducted have revealed two significant patterns: a deficiency in the proactive adjustment of base rates by central banks in response to inflation and the lead-lag relationship between ascending commodity prices and inflation. These findings underscore the cautious approach taken by central banks and their delayed response to the impact of external factors on inflation dynamics.

Keywords: *inflation response, Eastern Europe, monetary policy, inflation surge*

Acest articol oferă o analiză aprofundată a peisajului economic global actual, cu un accent deosebit pe Moldova, Ucraina, România și Polonia. Scopul acestui articol este de a examina răspunsurile băncilor centrale la provocările generate de inflația 2021-2023. Cercetarea folosește o combinație de metode științifice, inclusiv analiză empirică și cercetare cantitativă. Utilizează date din surse reputate precum Banca Mondială, Băncile Naționale și Birourile Naționale de Statistică pentru a examina diferiți indicatori economici. Software-ul statistic R este utilizat pentru analiza datelor, inclusiv analiza funcției de corelare încrucișată (CCF).

Ca răspuns la creșterea inflației, Moldova și Ucraina au crescut semnificativ ratele dobânzilor. Ulterior, Moldova a redus ratele treptat, în timp ce Ucraina a menținut un nivel ridicat pentru a-și proteja moneda. România și Polonia, cu economii mai puternice, au înregistrat creșteri mai ușoare ale ratelor și o creștere mai mică a inflației în comparație cu alte țări din Europa de Est, adoptând o abordare prudentă și întârziată, fără a reduce ratele de bază.

Un aspect critic al cercetării este implementarea analizei funcției de corelație încrucișată (CCF), care este utilizată pentru a explora corelațiile decalate între diferite variabile economice, cum ar fi rata de politică de bază, indicele prețurilor mărfurilor și IPC. Analizele efectuate au evidențiat două modele semnificative: o deficiență în ajustarea pro activă a ratelor de bază de către băncile centrale ca răspuns la inflație și relația "lead-lag" dintre creșterea prețurilor mărfurilor și inflație. Aceste constatări subliniază abordarea precaută adoptată de băncile centrale și răspunsul lor întârziat la impactul factorilor externi asupra dinamicii inflației.

Cuvinte cheie: *răspuns la inflație, Europa de Est, politică monetară, creșterea inflației*

В данной статье представлен углубленный анализ текущего глобального экономического ландшафта с особым акцентом на Молдову, Украину, Румынию и Польшу. Целью данной статьи является изучение реакции центральных банков на проблемы, связанные с инфляцией 2021-2023 годов. В исследовании используется сочетание научных методов, включая эмпирический анализ и количественные исследования. Для изучения различных экономических показателей используются данные из авторитетных источников, таких как Всемирный банк, национальные банки и национальные статистические бюро. Статистическое программное обеспечение R используется для анализа данных, включая анализ функции взаимной корреляции (CCF).

В ответ на рост инфляции Молдова и Украина значительно подняли процентные ставки. Позже Молдова постепенно снизила ставки, в то время как Украина сохранила высокую ставку для защиты своей валюты. Румыния и Польша, обладающие более сильной экономикой, испытали более мягкое повышение ставок и меньший рост инфляции по сравнению с другими странами Восточной Европы, приняв осторожный и отложенный подход и до сих пор не снизили свои базовые ставки.

Важным аспектом исследования является реализация анализа функции взаимной корреляции (CCF), который используется для изучения временных корреляций между различными экономическими переменными, такими как базовая учетная ставка, индекс цен на сырьевые товары и IPC. Проведенный анализ выявил две важные закономерности: недостаток активной корректировки базовых ставок центральными банками в ответ на инфляцию и зависимость опережения-запаздывания между ростом цен на сырьевые товары и инфляцией. Данные выводы подчеркивают осторожный подход центральных банков и их запоздалую реакцию на влияние внешних факторов на динамику инфляции.

Ключевые слова: *инфляционная реакция, Восточная Европа, денежно-кредитная политика, инфляционный всплеск*

INTRODUCTION

The ongoing topic of discussion among macroeconomists is the inflationary surge that has affected both developing and developed countries. It has been triggered by a combination of factors, including supply chain disruptions, increased demand as economies recover from the pandemic-induced recession, and rising commodity prices (Kose & Ohnsorge, 2022). Governments around the world had to implement various containment measures to curb the spread of the coronavirus, leading to factory closures, travel restrictions, and reduced consumer spending. These measures disrupted supply chains, causing shortages of critical goods and components, and resulted in increased production costs (Naseer et al., 2022). Additionally, geopolitical tensions and military conflict in Ukraine have contributed to a more cautious investment climate, affecting trade relations, and leading to volatility in financial markets (Guénette, Kenworthy & Wheeler, 2022).

To address the rising inflation, central banks in many countries have implemented strict monetary policies. They have raised policy interest rates, reduced monetary stimulus, and applied other measures to tighten credit conditions. The primary goal was to curb excessive demand, which could exacerbate inflationary pressures, and bring inflation back to their targeted levels (Prokopowicz, 2022). However, central banks faced a delicate balancing act. On the one hand, they need to control inflation to prevent eroding purchasing power and maintain economic stability. On the other hand, overly aggressive tightening measures could hamper economic growth and potentially trigger a recession, especially considering the fragile recovery from the pandemic-induced downturn (Coombs & Thiemann, 2022).

The inflationary surge has also brought new challenges to financial stability (Gopinath, 2023). High inflation can erode the value of assets and savings, impacting investors and savers (Bernanke et. al., 2001). Additionally, the surge in inflation coincides with historically high levels of government debt in many countries (Schnabel, 2023). Rising interest rates, often employed to counter inflation, can increase borrowing costs for governments, potentially leading to debt sustainability concerns (Bernanke at. al., 2001). For developed economies, the risk of a severe recession has become more pronounced (Schnabel, 2023), (Olaoye et. al., 2023). High inflation and tight monetary policies could dampen consumer spending and business investments, leading to a slowdown in economic growth. This poses a considerable challenge for policymakers, who must navigate between reducing inflationary pressures and sustaining economic recovery (Hazlitt, 2008). Governments now face difficult trade-offs. They need to strike a balance between controlling inflation, supporting economic growth, and maintaining financial stability (Brunnermeier, 2023). Crafting appropriate fiscal policies becomes crucial in this context. Effective management of government spending, taxation, and debt policies are essential to address these competing priorities (Gaspar & Eyraud, 2017).

LITERATURE REVIEW

Stagnation and inflation in developed economies. Researchers have examined the phenomenon of stagnation and persistently low inflation rates in several developed economies. Studies by Blanchard (2019) explored the costs of public debt in low-interest rate environment, while and Bolhuis et al. (2022) have highlighted CPI inflation estimates on real interest rates and monetary policy over time in the U.S. Schnabel (2023) analysed the challenge of persistent low inflation for monetary policy and advocated for expansionary fiscal policies to boost aggregate demand and increase inflation.

Inflation dynamics in emerging markets. In contrast to developed economies, some emerging markets have faced challenges of elevated inflation rates. Chang

et. al. (2022) showed that expansionary government spending shocks raise short and medium-term inflation expectations. In addition, surprise gasoline price hikes also raise inflation expectations. According to Ha, Kose & Ohnsorge (2022) Central banks in Emerging Market and Developing Economies face complex challenges as they struggle to establish trust in inflation control, which hampers price stability. Additionally, EMDEs are susceptible to global interest rate changes, posing risks of economic downturns and capital flight. Dladla & Malikane (2022) examine inflation dynamics in South Africa with a focus on understanding the link between economic activity measures and inflation rates. Olaoye et al. investigated the influence of fiscal policy on inflation in sub-Saharan Africa, highlighting that a positive fiscal policy shock, such as an increase in public debt, plays a significant role in driving inflation (Olaoye et.al., 2023).

Global supply chain disruptions and inflation. The outbreak of the COVID-19 pandemic and the Russia–Ukraine has exacerbated inflationary pressures worldwide, driven by disruptions in global supply chains, Kocabasoglu-Hillmer & Roden (2023) consider the paradoxical tension arising in upstream supply chains, especially in the context of radical innovation. They explore how firms can use paradox theory to comprehend and effectively manage the delicate balance between stability and change in this scenario. A separate study, utilizing a multi-regional, multi-sector computable general equilibrium model, examined the macroeconomic consequences of the energy interruption. Notably, the economic burdens of energy sanctions fell predominantly on European nations, with the United States facing relatively minor losses (Cui et. al., 2023). In their 2023 research, Rahbari, Arshadi Khamseh, & Sadati-Keneti examine resilience strategies for mitigating disruptions in the wheat supply chain. They employ the p-Robust Scenario-based Stochastic Programming approach to optimize this supply chain, considering both feasibility and optimality (Rahbari et.al.,2023). Guénette, Kenworthy, & Wheeler (2022) provide an overview of the global economic impact of COVID-19, highlighting a widespread economic downturn caused by lockdown measures enforced by most nations, which have markedly reduced global economic activity, resulting in business closures, unemployment, and disruptions across multiple sectors.

Central bank policies and inflation expectations. The response of central banks to the economic challenges has been a subject of research. Study by Svensson (2020) finds that the general monetary policy strategy of "forecast targeting" is more suitable for fulfilling the Federal Reserve's dual mandate of maximum employment and price stability than following a simple "instrument" rule such as a Taylor-type rule. Prokopowicz suggests that in 2022-2023, central banks raising interest rates as an anti-inflationary measure may have a more significant impact in triggering an economic downturn rather than effectively controlling inflation. This phenomenon occurs because commercial banks tend to raise lending rates more rapidly than deposit rates in response to central bank rate hikes (Prokopowicz, 2022).

Inflation targeting and its limitations. Inflation targeting frameworks, widely adopted by central banks globally, have also been scrutinized. In Hang Duong (2022) study, a difference-in-difference approach with a fixed model was employed. The results demonstrate that inflation targeting is effective in controlling inflation rates in emerging countries when they encounter external shocks, such as the global financial crisis in 2007, without causing significant trade-offs in output growth. Cecchetti & Kim (2004) results suggest that most countries could benefit from moving to price path targeting, where the central bank makes up for periods of above (below) target inflation with later periods of below (above) target inflation. Coombs & Thiemann (2022) highlight a paradoxical scenario where a strong state re-emerges, supporting financial speculation and worsening inequality, while also trying to tackle financial instability, protect jobs during the pandemic, and address climate change. Brunnermeier (2023) suggests central banks should act promptly, rather than waiting for inflation to manifest. They must consider both household and financial market expectations of future inflation, as these expectations influence both demand and asset prices.

Fiscal policy and its role in combating stagnation and inflation. Besides monetary policy, fiscal measures have come under focus as well. Studies by Bankowski et. al. (2023) reveals that high inflation in the euro area can negatively impact public finances due to an external energy-driven shock, reducing tax revenues, affecting business profitability and growth, and straining public spending. Monetary policy responses lead to higher government debt interest payments, potentially counteracting inflation benefits. Discretionary fiscal measures offer temporary effects with limited support for lower-income households. The increasing fiscal burden, especially in highly indebted countries, presents challenges amid rising interest payments. Gopinath (2023) emphasizes that central banks should lead the fight against inflation, while complementary policies are needed. Fiscal measures should target assistance to the vulnerable without stimulating the economy. Reducing fragmentation risks in global trade can also effectively mitigate supply shocks and boost global output. Evans, Honkapohja, & Mitra (2022) suggest that without a robust policy response, stagnation characterized by low economic activity and rapid deflation will. However, they advise that a fiscal stimulus, involving increased government spending, can effectively pull the economy out of this trap.

While the recent worldwide economic stagnation and inflationary trends have undoubtedly captured significant research attention, the current context of an ongoing inflation surge, and the hopeful journey towards stability, necessitates a closer examination of

how National Banks in Eastern Europe have confronted inflationary processes and whether they have achieved success. that analyse the effectiveness of National Banks' utilization of base rate instruments in influencing inflation rates, particularly with a focus on time-lagged cross-correlation functions. Our study is dedicated to filling this research gap and contributing to the ongoing exploration of inflationary processes.

DATA SOURCES AND USED METHODS

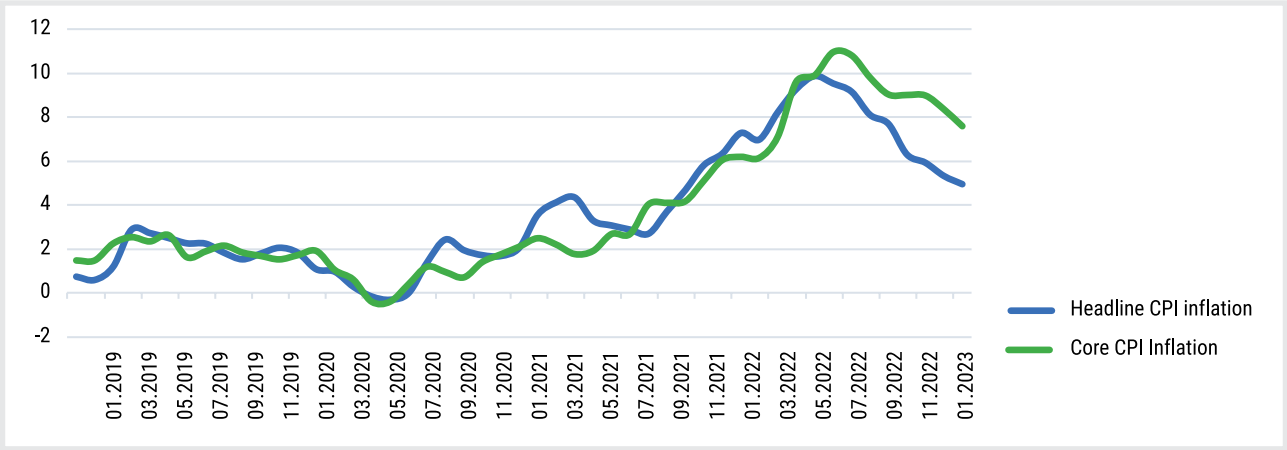
This article aims to conduct a thorough analysis of the current global inflation and economic situation, as well as its specific impact on the Eastern Europe region. The study involves evaluating worldwide macroeconomic conditions, focusing on inflation dynamics, salary levels, and government debts. Additionally, it delves into the mechanics of monetary policy transmission. Furthermore, this paper delves into an in-depth examination of the local macroeconomic conditions in Moldova, Romania, Ukraine, and Poland spanning from 2017 to June 2023. This period began with a relatively stable macroeconomic environment but witnessed a significant deterioration in 2022-2023, characterized by a substantial inflationary shock. An essential part of this research is the examination of the relationship between different economic variables through the cross-correlation function (CCF) analysis. To carry out the CCF analysis, the research employs R software, utilizing specific packages such as "stats" for statistical computations and "ggplot2" for visualization. These tools facilitate the exploration of time-lagged correlations between the variables, allowing for an in-depth understanding of their dynamic interrelationships. To achieve its objectives, the research employs a combination of qualitative and quantitative research methods. The data utilized in this study has been extracted from reputable sources, including the World Bank, National Banks, and National Bureaus of Statistics. This data encompasses a wide range of macroeconomic indicators, providing a comprehensive basis for our analysis. The integration of R software enhances the quantitative aspect of the study, providing robust statistical insights into the economic trends and policies.

THE CURRENT GLOBAL MACROECONOMIC ENVIRONMENT

Anticipated disinflation is expected to occur across major country groups due to declining prices of fuel and non-fuel items, along with the projected contractionary effects of tighter monetary policies on economic activity. However, the overall and core inflation rates remain significantly elevated compared to pre-2021 levels, surpassing the inflation targeting objectives in most countries with inflation targeting frameworks. The persistence of high inflation has become an economic challenge, necessitating careful policy considerations. In January 2023, core inflation, excluding food and energy prices, is projected to show only a gradual decline on a global scale, reducing to 4.8 percent from a maximum of 6.5 percent (Figure 1). This protracted moderation in core inflation underscores its resilience and difficulty to curtail quickly, compared to headline cpi inflation which dropped from 9.9 percent globally to 4.9 percents. Consequently, attaining the targeted inflation rates is expected to be a prolonged endeavour, with most countries aiming to reach their objectives by 2025, as per IMF data. Policymakers face the complex task of employing prudent measures to effectively control inflation and steer it back within desired ranges. This will require a balanced approach, where accommodating economic recovery and implementing tighter monetary policies converge to tackle inflationary pressures efficiently.

Figure 1 .

Global Headline CPI inflation vs Core CPI inflation (percentage)

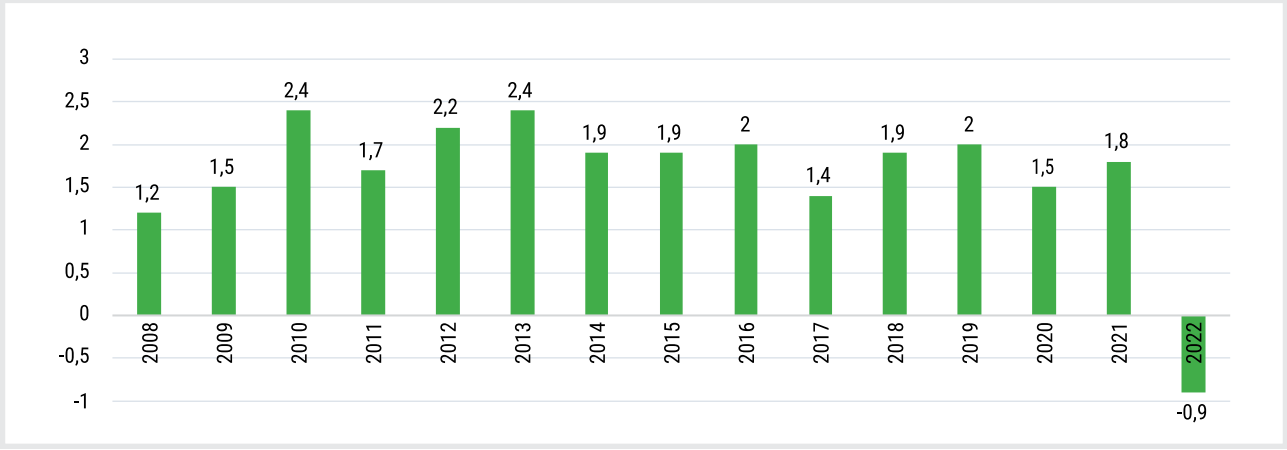


Source: Developed by the author based on The World Bank DataBank

Salaries. The nominal growth of wages continues to significantly lags inflation, leading to a sharp and unprecedented decline in real wages (Figure 2). Despite the risk of a wage-price spiral, the situation may not unfold in the present scenario. Labor markets are experiencing tightness, meaning that there is a shortage of qualified workers for available job positions. This condition usually gives employers less room to resist wage increases, as they need to attract and retain skilled employees. In recent years, corporate profit margins, which represent the difference between a company's revenue and its costs, have expanded. Larger profit margins imply that businesses have been able to maintain healthy profitability even as labour costs have risen. This ability to absorb growing labour costs on average could act as a buffer against more significant price increases, contributing to the stabilization of real wages.

Figure 2.

Annual average global real monthly wage growth, 2008–22 (percentage)



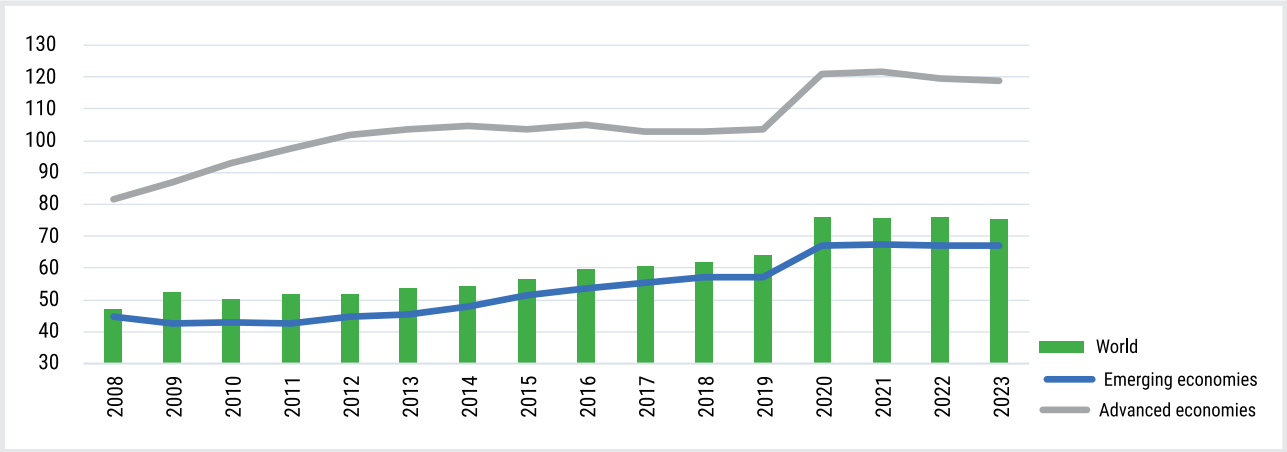
Source: Developed by the author based on International Labour Organization Global Wage Database

The level of government debt remains high. Because of the pandemic and economic disruptions over the past three years, both private and public debt have reached unprecedented levels in most countries. Despite a decline in 2021-2022 amid economic recovery from COVID-19 and growth, private and government debts continue to remain elevated. The tightening of monetary policies has led to a sharp increase in borrowing costs (Figure 3), raising concerns about the sustainability of debt in some countries. As debt levels accumulate, governments may face difficulties in servicing their debt obligations and may be forced to allocate a significant portion of their budget towards interest payments. This can limit the funds available for essential public services and investments.

The interaction between rising real interest rates and historically high levels of corporate and household debt poses another source of risk. Debt servicing costs are increasing amid weaker income growth, adding strain to

the financial situation of corporations and households. The persistently high level of debt restricts the capacity of fiscal policymakers to respond effectively to new challenges. Excessive government debt can have adverse effects on economic growth. High debt levels may lead to higher interest rates, crowding out private investments, and reducing overall economic activity. This can hinder productivity gains and hinder the country's long-term growth potential.

Figure 3.
Government gross debt, 2003–23 (share of GDP, percentage)



Source: Developed by the author based on (International Monetary Fund DataBank

The sustained high level of government debt not only poses challenges for economic policy but also impacts financial stability and the ability of governments to address emerging economic issues. Managing and reducing debt levels will be a critical task for policymakers to ensure the long-term health and stability of the economy. High government debt levels can restrict the flexibility of fiscal policymakers to respond to new economic challenges effectively. With limited room for additional borrowing, policymakers may find it challenging to implement countercyclical fiscal policies during economic downturns to stimulate growth and employment.

MONETARY POLICY TRANSMISSION MECHANISM.

The levels of interest rates and the exchange rate determine the monetary conditions under which the national economy operates. The monetary transmission mechanism occurs as changes in monetary conditions and influences the demand for goods and services. The propagation of impulses generated by monetary policy instruments towards inflation happens through complex cause-and-effect chains involving decisions made by economic agents and households in response to monetary policy measures. This leads to the expansion of the effects of monetary policy actions on the economy. The complexity of this mechanism varies both geographically and in time, which can be challenging due to the simultaneous occurrence of numerous shocks, which are unpredictable or unexpected events that cause economic fluctuations. The aim of monetary policy is to stabilize the system by absorbing, to a greater or lesser extent, the exogenous disturbances' effects.

The speed of transmission. Estimates of the transmission delay of monetary policy to prices can vary from instantaneous reactions (driven by exchange rate adjustments and changes in inflation expectations) to periods of 1.5-2.5 years (due to gradual price adjustments by companies or informational issues). Trust in the central bank and effective communication significantly influence the channels of expectations and exchange rates. When inflation expectations are firmly anchored, and the central bank's independence is high, monetary policy becomes more effective in restoring price stability with lower output costs (Bems et. al., 2020). However, if expectations are more backward-looking, as is the case in many developing countries, a stronger response from monetary policy is required to reorient expectations (Dizioli & Alvarez, 2023). In such situations, the transmission of exchange rates to consumer prices will be more pronounced (Carrière-Swallow, Gruss, & Magud, 2021). Moreover, a higher degree of financial development results in a slower transmission of monetary policy. In economies with less developed financial systems, where financial institutions have limited means to shield themselves from unexpected monetary policy actions, they need to react promptly to monetary policy shocks, leading to a faster transmission. On the contrary, in financially developed countries, financial institutions possess more

sophisticated instruments to hedge against surprises in monetary policy, causing delays in the transmission of monetary policy shocks. As emerging countries' financial systems evolve and financial innovations emerge, banks can better safeguard themselves against sudden changes in monetary policy, leading to a potential slowdown in the transmission of monetary policy (Havranek & Rusnák, 2013).

MACROECONOMIC SITUATION IN EASTERN EUROPE

The monetary policy objectives of the governments of Moldova, Ukraine, Poland, and Romania are outlined in their respective central banks' strategies. Each country has a central bank responsible for formulating and promoting monetary and exchange rate policies. The primary objective across these nations is to ensure and maintain price stability. However, the specific inflation targets vary:

- Moldova and Ukraine aim to keep inflation at 5.0 percent annually, with a possible deviation of ±1.5 percentage points.
- Poland and Romania, on the other hand, have a lower inflation target of 2.5 percent annually, with a possible deviation of ±1 percentage point.

These levels are considered optimal for the country's medium-term economic growth and development.

To achieve these inflation targets, central banks use various monetary policy tools:

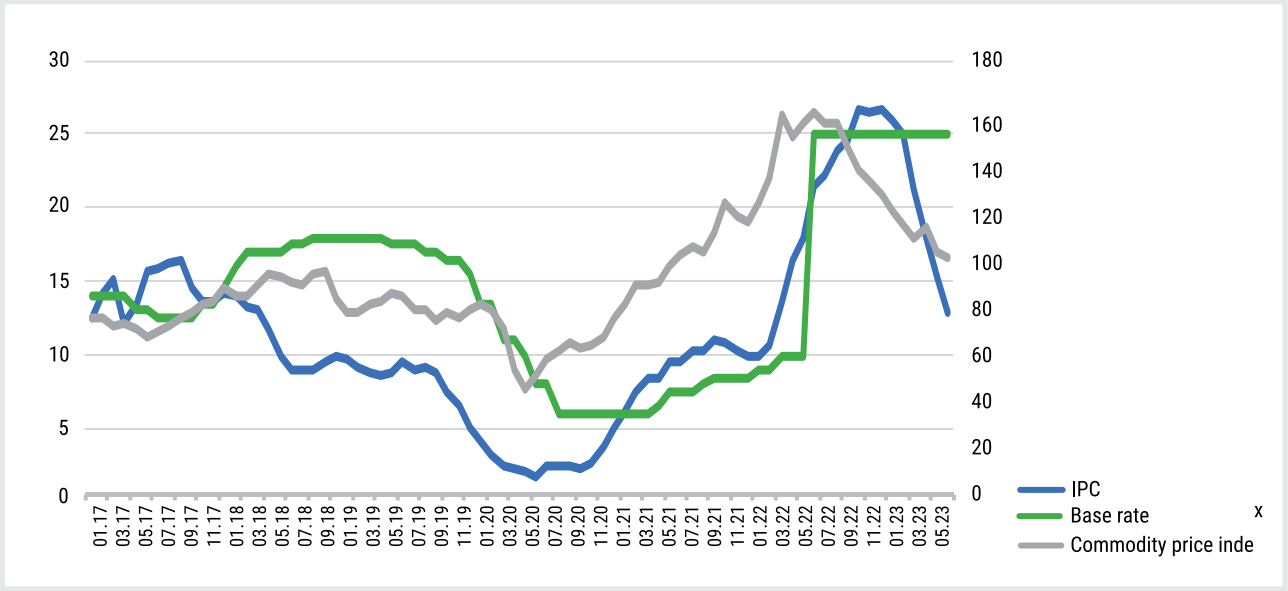
- Maintain low nominal interest rates to stimulate long-term investments and enhance economic competitiveness.
- Discourage speculative activities and enhance financial stability.
- Promote sustained economic growth, job creation, and increased productivity to improve citizens' quality of life.
- Safeguard individuals with fixed incomes and vulnerable social groups affected by high inflation rates, protecting their investment income and social payments (e.g., pensions, allowances).

CURRENT INFLATIONARY SITUATION IN MOLDOVA, POLAND, UKRAINE, AND ROMANIA

The economies in the region experienced a period of stagnation and even contraction in 2022. This significant downturn was the result of various factors, including an increase in the cost of living, the negative impacts of the war, and low agricultural production due to unfavourable weather conditions, which further exacerbated economic challenges. Additionally, disruptions in export and logistical chains, along with a more restrictive monetary policy than anticipated, exerted additional pressure on economic activity.

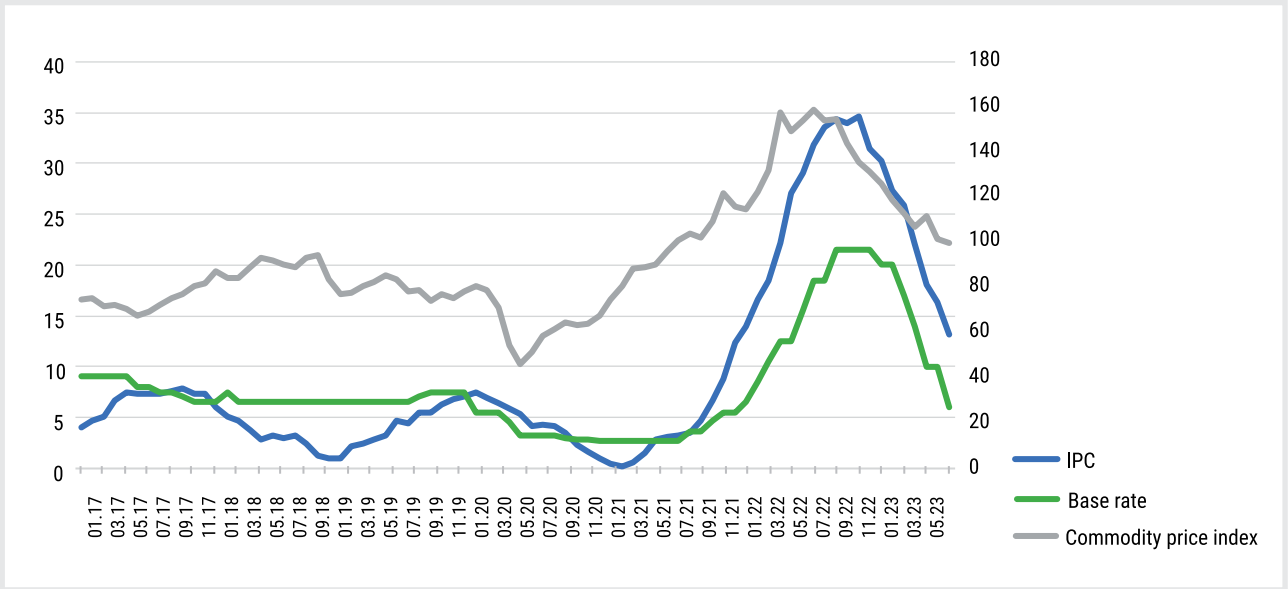
The tightening of monetary policy was driven by the accumulation of inflationary pressures, which became evident through consistent upward revisions in inflation forecasts. In January 2021, the central banks of Moldova and Ukraine raised their base rates from 2.65 percent and 6 percent, respectively, to 21.5 percent and 25 percent by the summer of 2022 (Figure 4&5). Moldova's National Bank cautiously maintained this level until November 2022, despite subsequent forecasts indicating a slowdown in inflationary pressures. After reaching its peak and experiencing a noticeable deceleration in inflation, the National Bank of Moldova initiated an easing cycle. They reduced the base rate by 1.5 percentage points in December, followed by decreases of 3 percentage points in February and March, and a further reduction of 4 percentage points in May. In June of the current year, they reduced the base rate by 6 percentage points. This gradual easing of monetary policy aligns with the inflation outlook. On the other hand, the Ukrainian National Bank has kept its base rate at 25 percent. This decision is aimed at maintaining the attractiveness of hryvnia-denominated instruments, ensuring the stability of the foreign exchange market, and reducing inflation. The NBU is prepared to commence a monetary easing cycle if the growth in real yields on hryvnia instruments and the reduction of risks to exchange rate sustainability continue to progress more rapidly than expected.

Figure 4.
IPC and policy rate in Ukraine vs Commodity Price Index



Source: Developed by the author based on World Bank Commodities Price Data,National Bank of Ukraine

Figure 5.
IPC and policy rate in Moldova vs Commodity Price Index

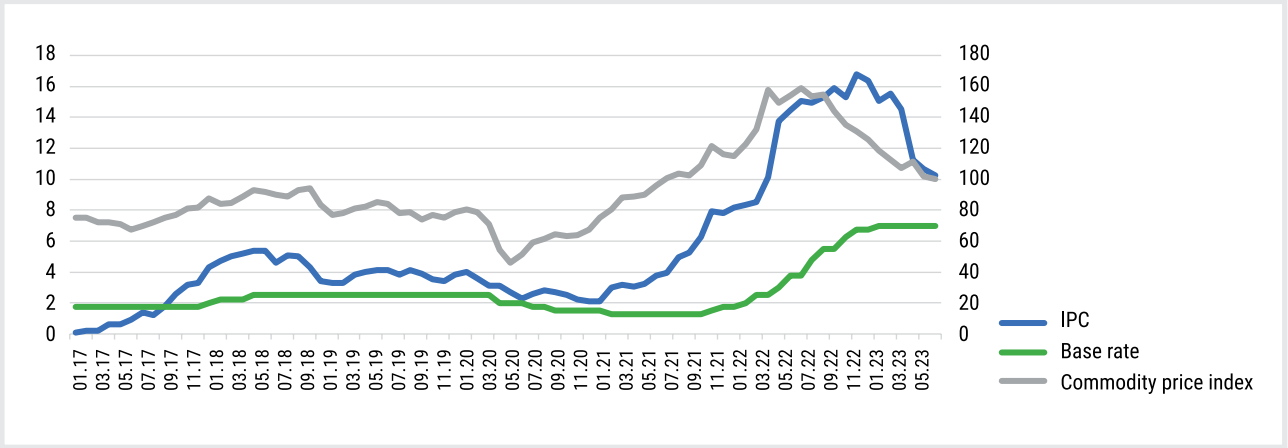


Source: Developed by the author based on World Bank Commodities Price Data, National Bank of Moldova

In June 2023, the inflation rate, as measured by the Consumer Price Index, decreased to 13.5 percent in Moldova and 12.8 percent in Ukraine annually. This decline marked a significant improvement from its peak levels of 34.6 percent in Moldova in October 2022 and 26.6 percent in Ukraine during the same period. These figures indicate that despite Ukraine being a country in conflict, the Moldovan economy is considerably more vulnerable to external price shocks.

In our analysis, we also examined Romania and Poland, both of which are European Union member states boasting more advanced economies. This economic robustness typically insulates them to some extent from external inflationary pressures. Nevertheless, it's important to highlight that despite their relatively strong economic positions, both countries witnessed a substantial upswing in their base interest rates and the Consumer Price Index (CPI) as shown in Figures 6&7. In September 2021, the central banks of Romania and Poland took significant steps by raising their base interest rates from 1.25 percent and 0.5 percent, respectively, to 6.75 percent in August 2022 and 7 percent in January 2023 (as illustrated in Figures 6 and 7).

Figure 6.
IPC and policy rate in Romania vs Commodity Price Index

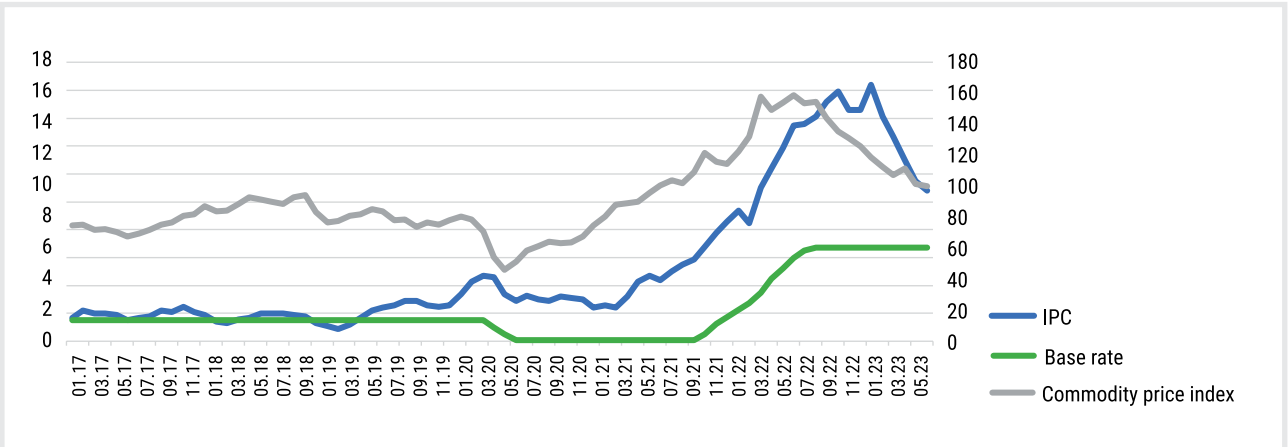


Source: Developed by the author based on World Bank Commodities Price Data, National Bank of Romania

Remarkably, these countries' national banks have continued to maintain these elevated rates, despite subsequent forecasts suggesting a potential deceleration in inflationary pressures. This divergence in monetary policy between Moldova and Ukraine on one hand, and Poland and Romania on the other, is quite evident. The latter two countries initiated their rate hikes later and continue to maintain these higher rates because the inflation rate exceeds the base rate, although it remains below the levels set by the Moldovan and Ukrainian national banks. This divergence underscores the relative economic strength of Poland and Romania compared to Moldova and Ukraine, as they have adopted a more cautious approach in managing their monetary policies.

The sharp drop in inflation can be attributed to the decline in global commodity prices and the gradual recovery of consumption. Given that food and energy prices are significantly influenced by global commodity prices, it is logical to conclude that tightening monetary policy may have limited impact on this component of inflation.

Figure 7.
IPC and policy rate in Poland vs Commodity Price Index



Source: Developed by the author based on World Bank Commodities Price Data, National Bank of Romania

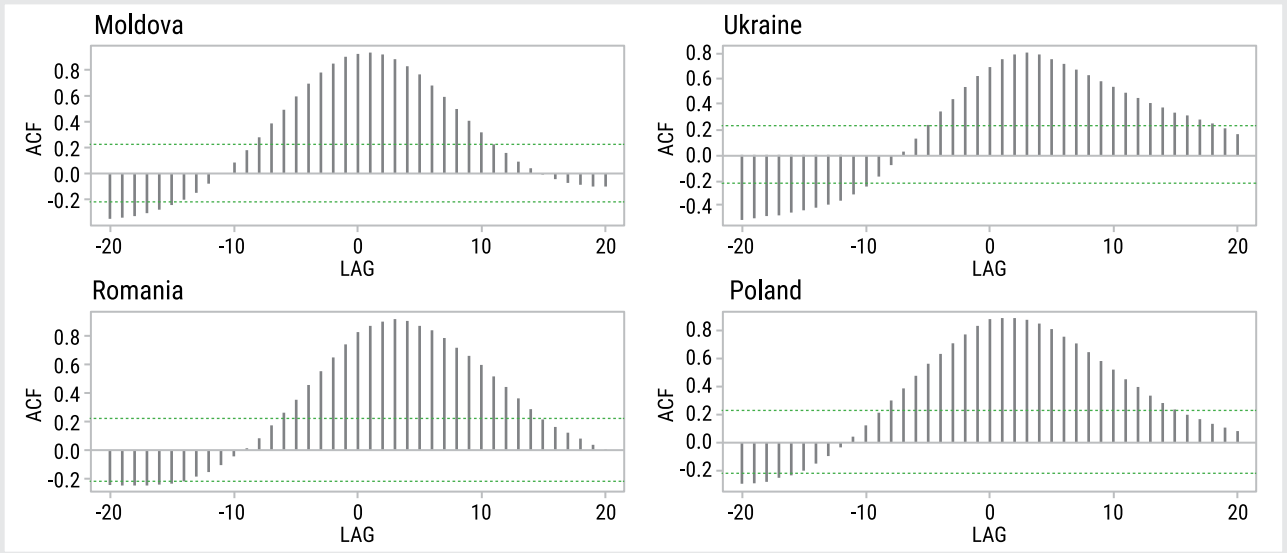
In 2023, a moderate economic recovery is expected, driven by increased domestic demand and improved prospects for trade growth, rapid inflation reduction, and monetary policy support for credit availability. The rise in wages and pensions in the public sector is expected to bolster consumption, while agricultural output is projected to increase in 2023. Additionally, a more lenient overall policy stance and lower-than-expected global energy prices are also likely to support demand. These factors are expected to bring inflation in the region within the target range by early 2024.

We will further perform a Cross-Correlation Function (CCF) analysis (Figures 8&9), which will allow us to explore how one series may lead or lag another across different time intervals. In this study, we will examine the time lags between changes in the Base Rate and IPC, as well as the Commodity Price Index and IPC for 78

months, January 2017 and June 2023. By doing so, we can gain insights into how fluctuations in the Base Rate and Commodity Price Index might precede or follow variations in IPC, offering valuable information for economic analysis and forecasting.

Figure 8.

Time-lagged Cross-Correlation between Base Rate and IPC in Moldova, Ukraine, Romania and Poland during January 2017 and June 2023

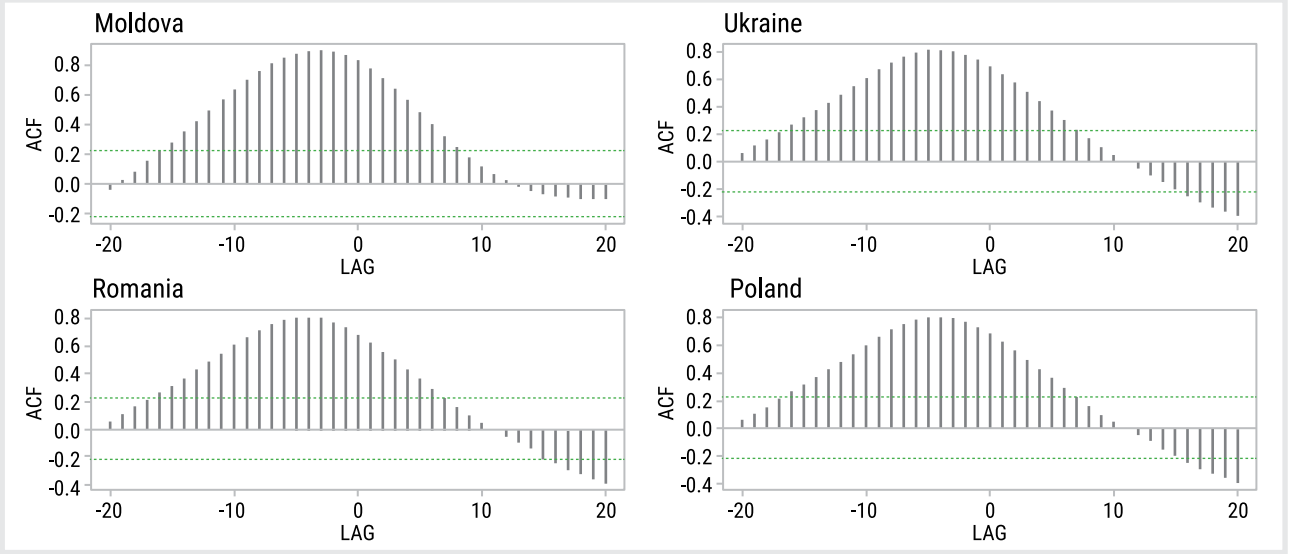


Source: Calculated by the author using "R" based on National Banks' datasets

From the examination of the cross-correlation function (CCF) data between the Base policy rate and IPC (Inflation Price Index), it appears that a notable positive correlation exists within the lags of -3/0 to 5/9 for the analysed countries. This relationship seems to run counter to conventional economic wisdom, which often posits that an increase in interest rates typically dampens inflation. However, the observed correlation is indicative of a situation where the central bank has increased the base rate in reaction to external inflation shock. This interpretation supports the idea that the central bank might have strategically altered the base rate to counterbalance inflationary pressures, specifically by elevating the base rate in response to IPC increases, thus explaining the positive correlation.

Figure 9.

Time-lagged Cross-Correlation between Commodity Price Index and IPC in Moldova, Ukraine, Romania and Poland during January 2017 and June 2023



Source: Calculated by the author using "R" based on National Banks' datasets

The provided data reveals a pronounced positive correlation within the indices range from -6 to 2/4, which suggests that a rise in commodity prices could be followed by a notable increase in the IPC approximately 6 to 2/4 periods later. This observed trend might signify meaningful economic responses to variations in commodity prices, reflecting inflationary influences.

CONCLUSIONS

The East European region faced economic stagnation and contraction in 2022 due to several factors, including rising living costs, the negative impact of the war, unfavourable weather conditions affecting agriculture, disruptions in export and logistical chains, and more restrictive than expected monetary policies. To counter inflationary pressures, Moldova and Ukraine significantly raised their base interest rates from January 2021 to the summer of 2022. Moldova later initiated an easing cycle in response to a deceleration in inflation, whereas Ukraine maintained its high base rate to safeguard its currency and combat inflation, reflecting the different strategies of the two nations. Notably, Moldova's economy appeared to be more vulnerable to external price shocks, despite Ukraine's ongoing conflict. On the other hand Romania and Poland initiated their rate hikes later than Moldova and Ukraine but have maintained higher rates because their inflation rates exceeded their base rates. This divergence highlights the relative economic strength of Romania and Poland compared to their counterparts.

The drop in inflation in early 2023 was attributed to declining global commodity prices and the gradual recovery of consumption. Core inflation remained more resilient, suggesting that tightening monetary policy might have limited impact on food and energy-related inflation.

In early 2023, amid global economic challenges driven by inflationary pressures and geopolitical factors, initial signs of a gradual recovery emerged from the pandemic and the Russia-Ukraine conflict. Supply chain disruptions eased, and energy and food sector challenges diminished. However, the outlook remains uncertain, with potential risks stemming from further escalation of the Russia-Ukraine war.

The analysis of Time-lagged Cross-Correlation between Commodity Price Index/IPC and Base rate/IPC during January 2017 and June 2023 has revealed two significant patterns. Firstly, a positive correlation between the Base policy rate and IPC within lags of -3/0 to 5/9 indicates that the central banks have raised the base rate in response to inflation. Secondly, a strong positive relationship between the Commodity Prices Index and IPC within the range of -6 to 2/4 suggests that increases in commodity prices lead to rises in the IPC.

Both findings indicate that central banks operated under the assumption that inflation was effectively managed and that inflation expectations would stay steady. They embraced a data-driven approach policy that intentionally postponed tightening measures. Central banks, in their pursuit of preventing premature constraints on economic output, chose not to increase interest rates in anticipation of rising future inflation. Instead, they waited for inflation to materialize thus their response to supply shock was delayed. In future, to address these issues, central banks must prioritize stabilizing inflation expectations and act swiftly when warning signs appear. It's crucial to consider market expectations of future inflation which significantly impact demand and prices.

REFERENCES

Bańkowski, K., Bouabdallah, O., Checherita-Westphal, C., Freier, M., Jacquinot, P., & Muggenthaler, P. (2023). Fiscal policy and high inflation. Economic Bulletin Articles, 2. https://econpapers.repec.org/article/ecbecbart/2023_3a0002_3a1.htm

Bems, R., Caselli, F., Grigoli, F., & Gruss, B. (2020). Gains from anchoring inflation expectations: Evidence from the taper tantrum shock. Economics Letters, 188, 108820. https://doi.org/10.1016/j.econlet.2019.108820

Bernanke, B., Laubach, T., Mihskin, F., & Posen, A. (2001). Inflation Targeting: Lessons from the International Experience. Princeton: Princeton University Press.

Blanchard, O. (2019). Public Debt and Low Interest Rates. American Economic Review, 109(4), 1197-1229. https://doi.org/10.1257/aer.109.4.1197

Bolhuis,, M. A., Cramer, J. N., & Summers, L. H. (2022). Comparing Past and Present Inflation. National Bureau of Economic Research. IMF Working Paper, 30116, june, 2-42. https://doi.org/10.3386/w30116

Brunnermeier, M. (2023, March). Rethinking Monetary Policy in a Changing World. https://www.imf.org/en/Publications/fandd/issues/2023/03/rethinking-monetary-policy-in-a-changing-world-brunnermeier

Carrière-Swallow, Y., Gruss, B., Magud, N. E., & Valencia, F. (2021). Monetary Policy Credibility and Exchange Rate Pass-Through. International Journal of Central Banking, september, 61-94. https://www.ijcb.org/journal/ijcb21q3a2.htm

Cecchetti, S., & Kim, J. (2004). Inflation Targeting, Price-Path Targeting, and Output Variability. Working Paper, 9672, 1-33. https://doi.org/10.3386/w9672

Chang, Y., Gómez-Rodríguez, F., & Hee Hong, G. (2022). The Effects of Economic Shocks on Heterogeneous Inflation Expectations. IMF Working Paper, 132, jule, 8-58. https://www.imf.org/en/Publications/WP/Issues/2022/07/01/The-Effects-of-Economic-Shocks-on-Heterogeneous-Inflation-Expectations-520274

Coombs, N., & Thiemann, M. (2022). Recentering central banks: Theorizing state-economy boundaries as central bank effects. Economy and Society, 51(4), 535-558. https://doi.org/10.1080/03085147.2022.2118450

Cui, L., Yue, S., Nghiem, X.-H., & Duan, M. (2023). Exploring the risk and economic vulnerability of global energy supply chain interruption in the context of Russo-Ukrainian war. Resources Policy, 81, march, 103373. https://doi.org/10.1016/j.resourpol.2023.103373

Dizioli, A., & Alvarez, J. A. (2023). How Costly Will Reining in Inflation Be? It Depends on How Rational We Are. IMF Working Papers, 021, 4-34. https://www.imf.org/en/Publications/WP/Issues/2023/02/03/How-Costly-Will-Reining-in-Inflation-Be-It-Depends-on-How-Rational-We-Are-529103

Dladla, P., & Malikane, C. (2022). Inflation dynamics in an emerging market: The case of South Africa. Economic Analysis and Policy, 73, 262-271. https://doi.org/10.1016/j.eap.2021.11.016

Evans, G. W., Honkapohja, H., & Mitra, K. (2022). Expectations, Stagnation and Fiscal Policy: A nonlinear analysis. International Economic Review, 63(3), 1397-1425. https://doi.org/10.1111/iere.12573

Gaspar, V., & Eyraud, L. (2017, April 19). Five Keys to a Smart Fiscal Policy. https://www.imf.org/en/Blogs/Articles/2017/04/19/five-keys-to-a-smart-fiscal-policy

Gopinath, G. (2023). Crisis and Monetary Policy. New Directions for Monetary Policy. Finance & Development, 60(1), 15-18. https://www.imf.org/-/media/Files/Publications/Fandd/Article/2023/March/FD0323-Monetary-Policy.ashx

Guénette, J.-D., Kenworthy, P., & Wheeler, C. (2022, April). Implications of the War in Ukraine for the Global Economy. https://documents1.worldbank.org/curated/en/099616504292238906/pdf/IDU00bdb5a770659b04adf09e600a2874f25479d.pdf

Ha, J., Kose, M., & Ohnsorge, F. (2022). From Low to High Inflation: Implications for Emerging Market and Developing Economies. https://doi.org/10.2139/ssrn.4074459

Hang Duong, T. (2022). Inflation targeting and economic performance over the crisis: evidence from emerging market economies. Asian Journal of Economics and Banking, 337-352. https://doi.org/10.1108/AJEB-05-2021-0054

Havranek, T., & Rusnák, M. (2013). Transmission Lags of Monetary Policy: A Meta-Analysis. William Davidson Institute Working Paper, 1038. https://doi.org/10.2139/ssrn.2188438

Hazlitt, H. (2008). Economics in One Lesson. Auburn, Alabama: Ludwig von Mises Institute. https://www.liberalstudies.ca/wp-content/uploads/2014/11/Economics-in-One-Lesson_2.pdf

Kocabasoglu-Hillmer, C., & Roden, S. (2023). Radical innovations as supply chain disruptions? A paradox between change and stability. Journal of Supply Chain Management, 59(3), 3-19. https://doi.org/10.1111/jscm.12299

Naseer, S., Khalid, S., Parveen, S., Abbass, K., Song, H., & Achim, M. (2022). COVID-19 outbreak: Impact on global economy. Frontiers in Public Health, 10, 1-13. https://doi.org/10.3389/fpubh.2022.1009393

Olaoye, O., Omokanmi, O., Tabash,, M., Olofinlade, S., & Ojelade, M. (2023). Soaring inflation in sub-Saharan Africa: A fiscal root? Quality&Quantity, may, 1-23. https://doi.org/10.1007/s11135-023-01682-z

Prokopowicz, D. (2022). The Postcovid Rise In Inflation: Coincidence Or The Result Of Misguided, Excessively Interventionist And Monetarist Economic Policies. International Journal Of New Economics And Social Sciences, 16(2), 105-148. https://doi.org/10.5604/01.3001.0016.3409

Rahbari, M., Arshadi Khamseh, A., & Sadati-Keneti, Y. (2023). Resilience strategies in coping to disruptions of wheat supply chain caused by the Russia–Ukraine war crisis: case study from an emerging economy. Kybernetes. doi:10.1108/K-12-2022-1728

Schnabel, I. (2023). Finding the right mix: monetary-fiscal interaction at times of high inflation*. SUERF Policy Note, 296, 1-16. https://www.suerf.org/docx/f_47b712717226fee1d3a663276dc82f20_59269_suerf.pdf

Svensson, L. E. (2020). Monetary Policy Strategies for the Federal Reserve. International Journal of Central Banking, 16(1), 133-193. https://www.ijcb.org/journal/ijcb2002_3.pdf

FAMILY SUPPORT SERVICES FOR VULNERABLE FAMILIES IN BULGARIA: BARRIERS AND CHALLENGES

DOI: https://doi.org/10.36004/nier.es.2023.1-09
JEL classification: J12, J13, J18
UDC: 364.6(497.2)

Tatyana KOTZEVA,
PhD in Sociology, Professor, Institute for Population and Human Studies at the Bulgarian Academy of Sciences, Sofia, Bulgaria
https://orcid.org/0000-0002-8823-4404
e-mail: t.kotzeva@iphs.eu

Krasimira MINEVA,
PhD in Psychology, Associate Professor, Burgas Free University, Burgas, Bulgaria
https://orcid.org/0009-0008-8059-844X
e-mail: kmineva@bfu.bg

Received 3 March 2023
Accepted for publication 2 June 2023

SUMMARY

Family support services are of crucial importance for families from vulnerable groups in order to ensure their normal access to the educational, health and social systems and to protect the child's best interest in parenting. The aim of this paper is to review the key challenges in effectively delivering family services to vulnerable families in Bulgaria through a discussion of the main barriers and facilitators in family support provision. The analysis is based on the data from a small-scale survey including online survey with 40 organizations providers of family services; interviews with 15 professionals working in these organizations and a group discussion with the services providers from the Community Center for Early Childhood Development and Parental Support "Nadezhda" in the city of Burgas, Bulgaria.

The main difficulties that the professionals came across in their work concerned convincing families to use the services, overcoming parents' unwillingness to cooperate with professionals and denying or neglecting the child's problem and handling the discrepancy between user's expectations and delivered services.

The survey data also outlined the proactive solutions and the directions for improvement in the quality of services: development of interaction and partnership with families from vulnerable groups; networking with other institutions and organizations to provide non-fragmented services; increasing the number of educational and health mediators that will increase parents' motivation and encourage services take-up; providing integrated services in the community through mobile groups and fieldwork; overcoming prejudices and discriminative attitudes toward marginalized groups and raising the level of awareness of families toward delivered services and their effects on child's wellbeing.

Keywords: *family support policy, service provision, vulnerable families, providers' opinions, barriers and facilitators in service provision, Bulgaria*

Serviciile de sprijin pentru familie sunt de o importanţă crucială pentru familiile din grupurile vulnerabile, pentru a le asigura accesul normal la sistemele educaţionale, de sănătate şi sociale şi pentru a proteja interesul superior al copilului în educaţie parentală. Scopul acestei lucrări este de a revizui provocările cheie în furnizarea eficientă a serviciilor familiale familiilor vulnerabile din Bulgaria, printr-o discuţie despre principalele bariere şi facilitatori în furnizarea de sprijin pentru familie. Analiza se bazează pe datele dintr-un sondaj la scară mică, inclusiv un sondaj online cu 40 de organizaţii furnizori de servicii pentru familie; interviuri cu 15 profesionişti care lucrează în aceste organizaţii şi o discuţie de grup cu furnizorii de servicii de la Centrul comunitar pentru dezvoltarea timpurie a copilăriei şi sprijin parental „Nadezhda" din oraşul Burgas, Bulgaria.

Principalele dificultăţi întâmpinate de profesionişti în activitatea lor au vizat convingerea familiilor să folosească serviciile, depăşirea ne dorinţei părinţilor de a coopera cu profesionişti şi negarea sau neglijarea problemei copilului şi gestionarea discrepanţei dintre aşteptările utilizatorilor şi serviciile furnizate.

Datele sondajului au evidenţiat, de asemenea, soluţiile pro active şi direcţiile de îmbunătăţire a calităţii serviciilor: dezvoltarea interacţiunii şi parteneriatului cu familiile din grupurile vulnerabile; crearea de reţele cu alte instituţii şi organizaţii pentru a oferi servicii nefragmentate; creşterea numărului de mediatori educaţionali şi sanitari care vor spori motivaţia părinţilor şi vor încuraja utilizarea serviciilor; furnizarea de servicii integrate în comunitate prin grupuri mobile şi lucru pe teren; depăşirea prejudecăţilor şi atitudinilor discriminatorii faţă de grupurile marginalizate şi creşterea nivelului de conştientizare a familiilor faţă de serviciile furnizate şi efectele acestora asupra bunăstării copilului.

Cuvinte cheie: *politică de sprijin familial, furnizarea de servicii, familii vulnerabile, opiniile furnizorilor, bariere și facilitatori în furnizarea de servicii, Bulgaria*

Службы поддержки семьи имеют решающее значение для семей из уязвимых групп, чтобы обеспечить им нормальный доступ к системам образования, здравоохранения и социальной защиты, а также защитить интересы ребенка в воспитании детей. Целью данной статьи является рассмотрение ключевых проблем в эффективном предоставлении семейных услуг уязвимым семьям в Болгарии путем обсуждения основных препятствий и факторов, способствующих оказанию поддержки семьям. Анализ основан на данных небольшого опроса, в том числе онлайн-опроса с участием 40 организаций-поставщиков семейных услуг; интервью с 15 специалистами, работающими в этих организациях, и групповая дискуссия с поставщиками услуг Общественного центра раннего развития детей и поддержки родителей «Надежда» в городе Бургас, Болгария.

Основные трудности, с которыми столкнулись специалисты в своей работе, касались убеждения семей воспользоваться услугами, преодоления нежелания родителей сотрудничать со специалистами, отрицания или игнорирования проблемы ребенка, а также устранения несоответствия между ожиданиями пользователей и оказанными услугами.

Данные опроса также обозначили инициативные решения и направления улучшения качества услуг: развитие взаимодействия и партнерства с семьями из уязвимых групп; создание сетей с другими учреждениями и организациями для предоставления нефрагментированных услуг; увеличение количества посредников в сфере образования и здравоохранения, которые повысят мотивацию родителей и будут стимулировать пользование услугами; предоставление интегрированных услуг на местном уровне посредством мобильных групп и работы на местах; преодоление предрассудков и дискриминационного отношения к маргинализированным группам и повышение уровня осведомленности семей о предоставляемых услугах и их влиянии на благополучие детей.

Ключевые слова: политика поддержки семьи, предоставление услуг, уязвимые семьи, мнения поставщиков, барьеры и факторы, способствующие предоставлению услуг, Болгария

INTRODUCTION

CHILD PROTECTION SYSTEM IN BULGARIA

State policy for child protection in Bulgaria was comprehensively formulated by the Child Protection Act, established and adopted in 2000. The law stipulates that the state provides care for children only in cases of lack of care by relatives, and the family remains a priority for child-rearing. Until the adoption of the Child Protection Act, there was no special law to regulate the rights of the child as provided for in the Convention on the Rights of the Child, ratified by the Bulgarian government in 1990. By-laws regulated the protection of the child in the absence of parental care.

The system of child protection functions through measures and social support in its two main forms: financial assistance or benefits in kind and social activities and services. Children at risk are a top priority for protection. The main institution in the country for implementing child protection policy is the Agency for Social Assistance to the Ministry of Labour and Social Policy with child protection departments (CPD) as regional units in the 28 regions of the country. Alongside the state-run institutions, the NGO sector has a key role in setting social policy priorities and providing social services and advocacy campaigns to support children and families.

In the framework of child welfare reform in Bulgaria (Markova et al 2018), during the last decade child protection policy has been developed around the following priorities: reducing child poverty and creating social conditions for children's social inclusion; ensuring equal access to quality preschool and school education for all children; improving children's health and encouraging children's participation in forming and implementing policies related to their rights and responsibilities (UNICEF-BG 2019).

PRESSING GAPS IN SERVICE PROVISION IN BULGARIA

Despite some government-funded policies, programs and pilot projects aimed at improving parenting skills and knowledge, support for families and parents is fragmented and is not considered part of a broader family and children's policies (World Bank 2019). Additionally, the public debate is influenced by the resistance to parental policies and their effectiveness, expressed by part of the parental organizations (Nenova, Luleva, Kotzeva, 2023). Social services lack flexibility and sustainability, which can enable them to play a preventive and supportive role in limiting the risk of child poverty and social inclusion.

There are no systematic approaches to monitoring the needs of parents and their priority areas. Parents are not actively involved in monitoring the quality and management of ECEC services and school management through participation in public councils and surveys (Kotzeva, 2021; Todorova, 2019). Additionally, with a few exceptions like a national campaign "Being a father" as part of the international MenCare campaign in support of fatherhood[1], a proactive role of fathers in raising young children through their inclusion in the work of early child education and care (ECEC) services, public campaigns promoting shared parenting and having more male practitioners in supporting and teaching professions have been missing.

[1] *https://old.mencare.bg/za-kampaniata/*

CHILDREN IN NEED IN BULGARIA: AT THE HEART OF FAMILY POLICY AND SERVICE PROVISION

Bulgaria ranks among the EU countries with a very high percentage of child poverty (NSI, 2021). According to a UNICEF report from January 2023 (UNICEF-BG, 2023, p. 49), 24% of children in the European Union during the 2021 year were at risk of poverty or social exclusion, and Bulgaria was among the top three countries (together with Romania and Spain) in the EU with the highest percentage of children at risk – 33%. Children in need are defined as children who are at risk of poverty or social exclusion, as well as children who are highly vulnerable due to specific factors (UNICEF-BG, 2022, p. 31). The action plan of the Bulgarian government (Action plan, 2022, p. 3) based on the European Child Guarantee (ECG) outlines those children at risk of poverty and social exclusion in Bulgaria in 2021 were about 400 thousand. In the same document, it is pointed out that 90.3% of children from the Roma ethnic group live in material deprivation (deprived of at least 1 out of 13 measured indicators), while for children from the Bulgarian ethnic group, this percentage is lower: 26.3%. The goal of the national policies is a 50% reduction in the number of children at risk of poverty or social exclusion in Bulgaria till 2030 year.

According to the European Child Guarantee – the European Commission's document that states an overwhelming policy initiative to reduce child poverty in Europe, the main drivers are not only poverty per se but limited access to goods and services (EC, 2021). The ECG defines several groups of children at risk of poverty and different forms of disadvantage: homeless children or children experiencing severe housing deprivation; children with disabilities; children with mental health issues; children with migrant backgrounds; children in the alternative, particularly institutional care; children with minority ethnic backgrounds, particularly Roma and children in precarious family situations. The latter group of families refers to a multidimensional set of risks of poverty comprising living in a single-earner household, living with a parent with disabilities, living in a household where there are mental health problems or long-term illness, living in a household where there is substance abuse or domestic violence; children of a Union citizen who has moved to another Member State while the children themselves remained in their Member State of origin (so-called Skype-children), children having a teenage mother or being a teenage mother and children having an imprisoned parent.

Child poverty is more widespread in large families, in families where parents possess a low level of education and are unemployed, among single parents and families vulnerable to different risks.

While risks of poverty are relevant for all the above-mentioned groups, the highest levels of poverty or social exclusion are observed among children living in Roma families and families with precarious situations (UNICEF-BG, 2022). While 20,1% of children of Bulgarian origin live at risk of poverty or social exclusion, the share of poor children in the Roma community is 87,6% (UNICEF-BG, 2022, p. 45). The main drivers for poverty are present in the Roma community: large families, parents with primary or less than primary education and households with very low work intensity (less than 20%), implying unemployed parents. As a result of poverty, Roma children are largely excluded from ECEC services, they are more likely to leave school early, live in overcrowded dwellings with poor housing conditions and have no effective access to healthcare (RECI+, 2020).

The experience in different countries indicates that family support services and measures of social protection are key elements for the prevention of and coping with multiple risks for the proper physical and psycho-social development of children in those families (Abela et al, 2021; Thévenon, 2020). Family support services are especially important for parents from vulnerable groups who have limited access to material resources and experience severe constraints in approaching educational, health and social services (Acquah & Thévenon, 2020).

RESEARCH AIM AND METHODOLOGY

The main aim of this paper is to review the key challenges in effectively delivering family services to vulnerable families in Bulgaria through a discussion of the main barriers and good practices in family support provision. Our main hypothesis is based on the cultural specificities and low socioeconomic status of disadvantaged families, mainly from the Roma community, as beneficiaries of social services. We suppose that family support providers will face barriers with access to needy families and their motivation to be included in the services. The main challenge for a practitioner's effective social work will be to build trustful and long-term relations with the parents and community members.

The analysis is based on the data from a small-scale survey[2].

[2]The survey has been funded by the National Science Fund at the Ministry of Education and Science within the project "National Review on policies and practices in family support services", Co N КП-06-КОСТ-9 / 07.10.2020

The survey is grounded on a mix-methods methodology and includes:

- *Online survey with 40 organizations providers of family services;*
- *Interviews with 15 professionals working in these organizations;*
- *Group discussion with the services providers from the Community Center for Early Childhood Development and Parental Support "Nadezhda" in the city of Burgas, Bulgaria.*

The main topics of the survey and the focus group discussion concern users' level of information and access to services, ways of service implementation, including case management, participant responsiveness, barriers encountered by professionals in providing services to families of vulnerable groups and ways of integration between delivery organizations and local institutions.

The online survey was administered in a Google Forms format in the winter of 2022 through personal emails to around 100 NGOs that provided services in the country. Finally, 40 organizations completed the questionnaire fully. The interviews and focus groups were conducted in the period November 2021 - March 2022.

MAIN RESULTS

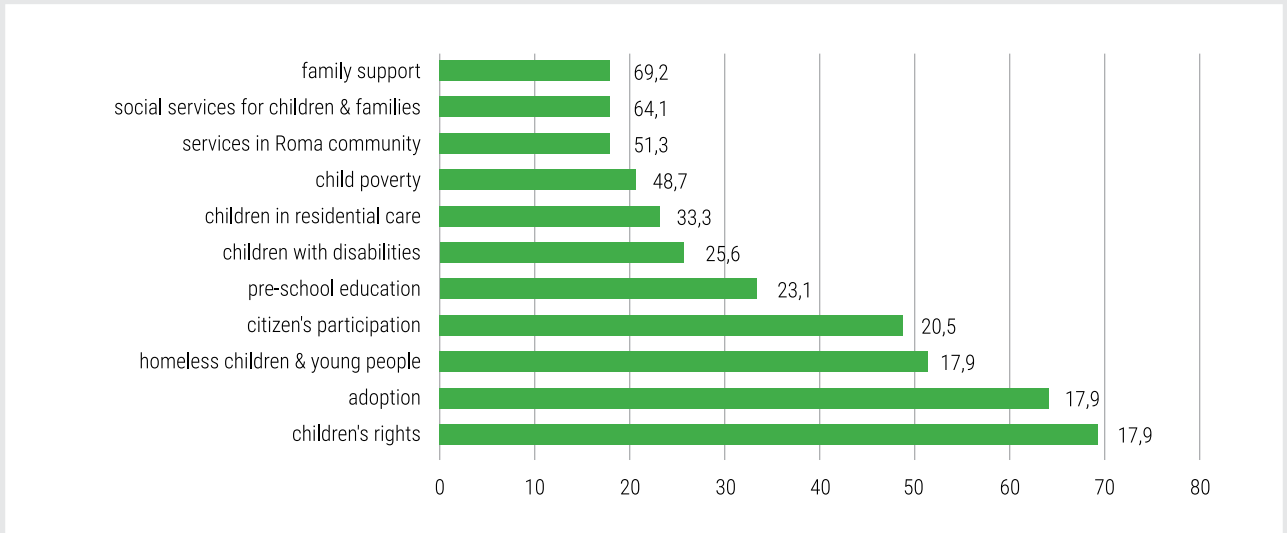
PROFILES OF SERVICE PROVIDERS

Most of the organizations that filled in the questionnaire were experienced providers with more than 5 years of activities in delivering services in the community, situated in the biggest cities of the country like Sofia, Plovdiv, Varna, Pernik, etc. Their staff is multidisciplinary and includes predominantly social workers, psychologists, mediators and special pedagogies. When naming their services the organizations pointed out their facilities as Center for community support; Center for social rehabilitation and integration; Family support Centers for early child development; Social enterprises for young people from institutions and problematic family environments, Centers for mobile work and with homeless children, Centers for working with human trafficking and domestic violence, etc.

The questionnaire started with questions about the main areas of service provision and the most targeted users of service delivery[3].

Data in *Fig. 1* present the area of the services provided by the organizations in the sample. Two-thirds of the organizations indicated their work as services in family support (69,2%) and social services for children and families (64,1%). Nearly half of the organizations mentioned that they worked with Roma families (51,3%) and that their main priority was child poverty (48,7%). One-third of organizations were engaged with services toward children in residential care (33,3%) and one-fourth – toward children with disabilities (25,6%) and preschool education (23,1%). Less than 20% reported that they were engaged in advocacy of children's and youth's rights.

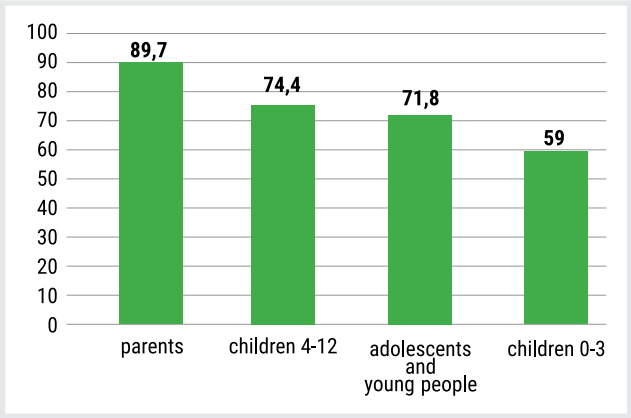
Figure 1.
Area of service provision (%)



Source: Calculations based on the survey data

[3] *In the questions with multiple answers the total sum of answers exceeds 100%.*

Figure 2.
Users of service provision (%)



Source: Calculations based on the survey data

Data in Fig. 2 show the main target groups of users whose needs were referred to by the organizations: parents were the main target group (89,7%), the next groups were children aged 4-12 (74,5%), adolescents and young people (71,8%) and children aged 0-3 (59%) (Fig.2).

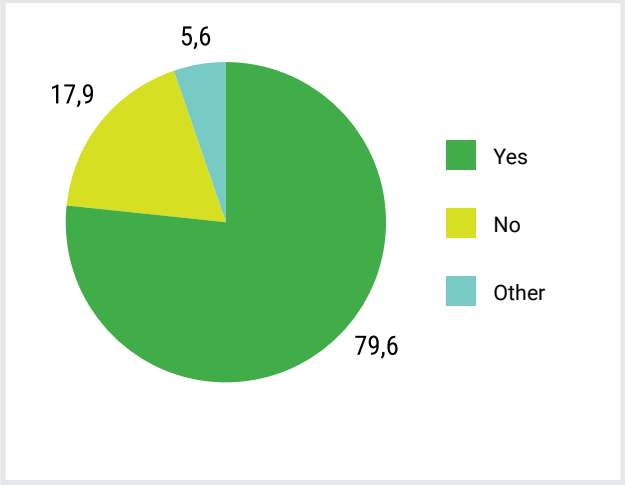
The organizations in the sample provided a wide range of services including family counseling services, in-home supports (including mobile work), referrals to GPs, pediatricians and other social institutions, food access (meal vouchers and vouchers for dairy kitchen, etc.), parent education related to healthy child development, early learning, effective parental skills, early child prevention of abandonment, drop-outs from school, delivery of basic material resources (clothing, diapers, hygiene items, etc.).

ACCESS TO AND DELIVERY OF SERVICES

Key issues in family support services concern the issues of how to find out and reach the most needful families, how to spread information about services and how to ensure that families in need are informed about them. Answers to the question "*Does your organization have a well-established procedure for assessing the service needs of families and children?*" showed that a vast proportion of organizations (76,9%) reported positively about the procedure of reaching out new users and less than one-fifth of organizations (17,9%) gave a negative answer. (Fig.3)

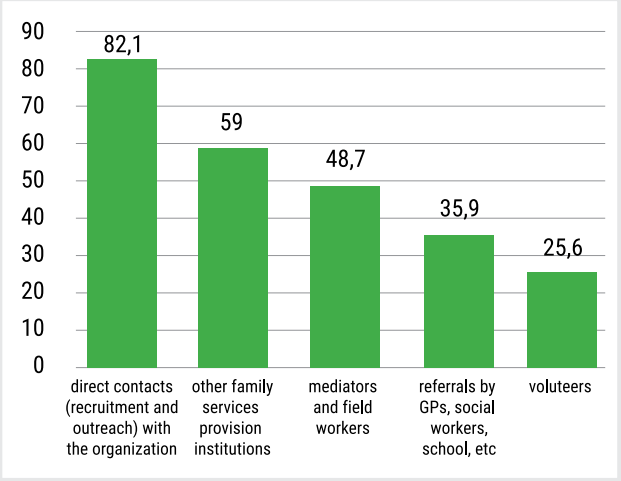
In response to the question "*How do new users reach the organization to use the service?*" the providers defined a wide variety of channels for access to beneficiaries among which the most spread are through direct contacts (recruitment and outreach) – 82,1%, through other family services institutions - 59%, through mediators and community workers – 48,7% and through referrals by GPs, social workers, school, etc – 35,9%. The organizations rely on volunteers' help in 25,6% of cases of searching for new users. (Fig. 4).

Figure 3.
Well-established procedure for assessing families and children's needs (%)



Source: Calculations based on the survey data

Figure 4.
Channels for new users' access to the organization (%)

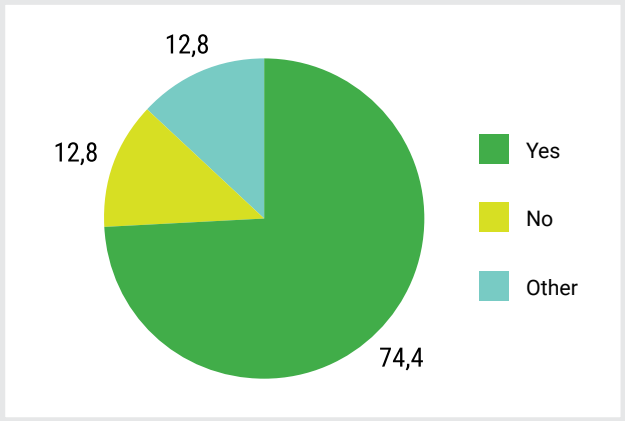


Source: Calculations based on the survey data

Case management is a key mechanism to provide effective family support services in order to guarantee better communication, information and advocacy between provider and family that helps to minimize bureaucratic procedures. The predominant proportion of organizations (74,4%) gave a positive answer to the question "*Does your organization have case managers, providing support to families?*". 12,8% of the organizations did not use case management and 12, 8% gave other responses like "the whole team is involved in the project", "personal mentors play this role", etc. (Fig.5).

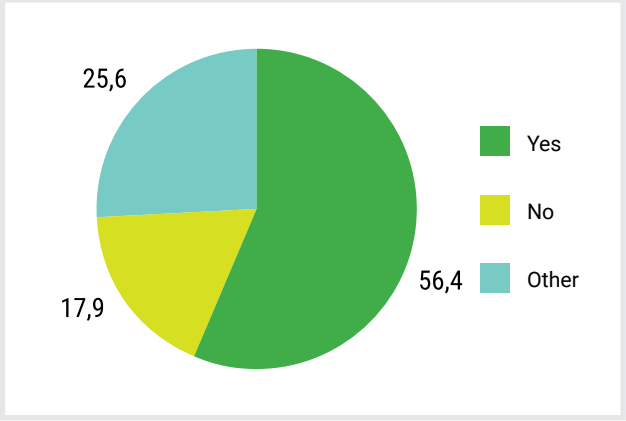
The next question concerns the providers' experience with home visits "Do case workers visit families in their home to assess their needs (except from a provision of mobile services)?" More than half of the providers (56,4%) implemented case management work by visiting families in their homes, 17,9% visited homes in special circumstances and 25,6% did not offer home visits (Fig. 6).

Figure 5.
Case workers at the organization



Source: Calculations based on the survey data

Figure 6.
Home visits of caseworkers (%)



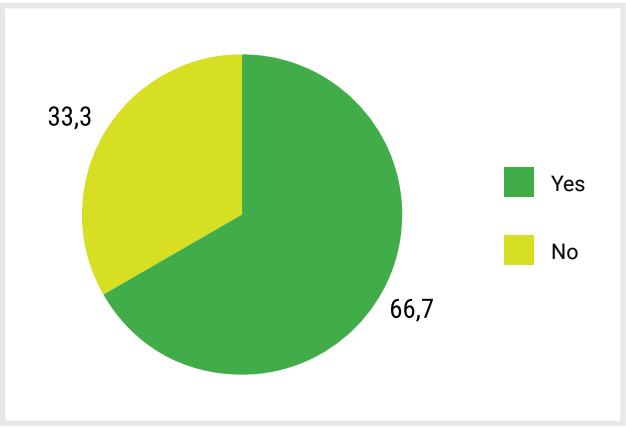
Source: Calculations based on the survey data

FAMILIES' REFUSALS AND SERVICES USE STOP

One of the biggest challenges for practitioners working with families and children is keeping families motivated to use the services in the long term and motivating them not to refuse to be served. It is part of the adaptability of interventions to a local context and to the specific needs of families in need. Knowledge of the cultural norms of users at individual and community levels and the communication skills of the providers are crucial for the successful recruitment and retention in services for families in a disadvantaged situation.

The answers to the question "*Do you have cases of a user refusing to receive service?*" confirmed that refusals and stop using services were a reality faced by two-thirds of the organizations and respectively for one-third of them these practices did not exist or rarely happened. (Fig.7).

Figure 7.
Families stop using services (%)



Source: Calculations based on the survey data

In an open-ended question, the respondents were asked to define the most common reasons that stood behind the users' refusals. The respondents gave a variety of answers that were categorized into the following explanations:

First of all, the reluctance of users to receive support is related to parents' prejudices and assumptions: parents misunderstood the meaning of cooperation with professionals; parents denied or neglected the seriousness of the child's problem; parents did not see rapid progress in their children's development as a result of the professional assistance provided or their expectations have not been confirmed; parents did not want to make efforts and cooperate with the teams, parents complained about the intensity of work; parents expected a material benefit in order to cooperate;

Second, often users did not give a specific reason for the refusal; or they changed their address through moving to another settlement or to another country or their children were grown-ups;

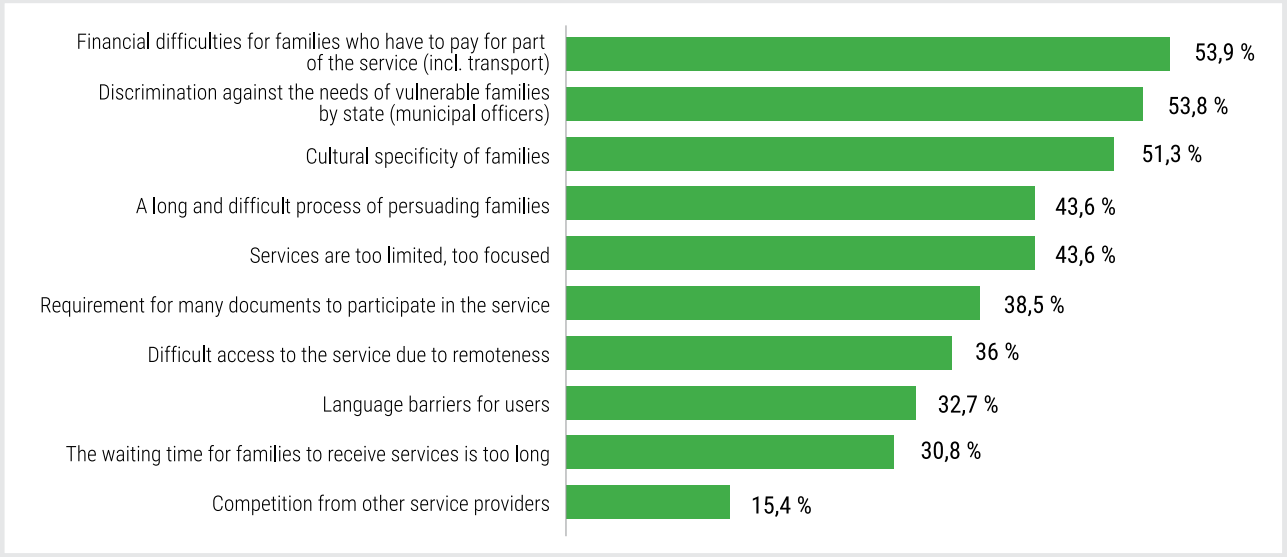
Third, users felt that they had resources and could cope with the child's problems on their own and without additional support; or parents had no motivation and discipline to follow practitioners' instructions, or parents were afraid that the social units/workers would take away their children and place them in other families.

THE MAIN BARRIERS TO PRACTITIONERS' WORK

Having in mind the main reasons for users to refuse or stop using the services, it was interesting to look at how the practitioners grasp the barriers in their work answering the question 'To what extent does your organization face the following barriers when working with families and children?' The respondents were offered a set of barriers to be assessed according to 5 point scale: 'not at all', 'poorly', 'moderate', 'to a large extent' and 'completely'.

Combining the three answers 'completely', 'to a large extent and 'moderate' we ranged the barriers as follows. The strongest barriers shared by half of the respondents were: Financial difficulties for families who have to pay for part of the service (including transport) – 53.9%; Discrimination against the needs of vulnerable families by state (municipal officers) – 53.8%; Cultural specificities of families – 51.3%. The next group of barriers was supported by 30-44% of the respondents: A long and difficult process of persuading families – 43.6%; Services are too limited, too focused – 43.6%; Requirement for many documents to participate in the service – 38.5%; 6. Difficult access to the services due to remoteness – 36%; Language barriers for users – 32.7%; The waiting time for receiving services is too long – 30.8%. Competition from other service providers received the lowest weight in the respondents' range of barriers – 15,4% (Fig. 8). The mentioned grading of barriers shows obviously the directions for working with vulnerable families toward the elimination of the financial burden of services and reducing discriminatory attitudes and practices among practitioners in state and private service provision.

Figure 8.
Barriers in the providers' work with families and children (%)



Source: Calculations based on the survey data

GOOD PRACTICES IN SERVICE PROVISION

Good practices in providing support services to families and children were explored in terms of the ways that organizations use to increase the trust of service users in professionals and to keep the users longer as beneficiaries. The results showed that the trust of families in service providers is developing due to the positive effects of the services provided, the key is the effectiveness of the assistance provided.

Answering the open-ended question: "What methods does your organization use to retain users of the service, for example, you provide feedback to families to share common ratings and goals?", the providers' responses were arranged as follows: non-judgmental, supportive attitude (i.e. acceptance and understanding); equality, respect and partnership with parents in assessing needs and preparing the care plan – signing a contract for the provision of services (i.e. voluntariness of participation); constantly informing parents and providing objective feedback at every stage of the joint work; applying a holistic approach, striving to meet all the needs of families from vulnerable social groups in one place (in community centers) through a multidisciplinary team; use of mobile groups – fieldwork; by providing social-household and health support (material – food, medicines, hygiene materials, etc.); information and work to increase motivation.

The answers to the next open-ended question about the measures of organizations to provide more effective access to beneficiaries outlined the areas in which to focus the efforts of professionals in the future: outreach work through mobile groups consisting of different professionals who provide services to those in need directly in the community; increasing the number of mediators; organizations providing services to become more recognizable and to work to increase their authority among the vulnerable families; promoting programs for working with families through various information campaigns, open days, etc. improving the quality of services so that working with children and families is more effective; development of partnership with the education system.

BARRIERS (FREEFORM COMMENTS FROM THE GROUP DISCUSSION)

A group discussion with specialists from the community Center for Early Childhood Development and Parental Support „Nadezhda" shed more light on the barriers in the practitioners' work. The Center is placed next to one of the municipality kindergartens in the city of Burgas, Bulgaria. The municipal kindergarten and the Center are in a district neighboring the Roma community settlements. The Center's team consists of 15 professionals and additionally, the Center uses the help of a dentist, a pediatrician and health mediators.

The Community Center has accumulated extensive experience – since its establishment in May 2016, integrated services for early childhood development have been provided to over 1600 children with disabilities or from vulnerable social groups and to over 900 current and future parents. This Center is one of the 66 Centers developed in the country within the framework of the two large-scale national projects "Social Inclusion Project" (2008-2015) and "Services for Early Child Development" (2016-2022) funded by the World Bank. These Centers have developed and implemented family and children's support services with priorities on creating an opportunity to raise children in a family environment, preventing the abandonment of children and their placement in institutional care, developing parental skills, preventing children from dropping out of the educational system and increasing their readiness to participate in it; prevention of intergenerational transmission of poverty and improved access to health care. (Services for early childhood development, 2020; SIP, n.d.)

Six persons from the community Center "Nadezhda" personnel took part in the group discussion. Two social workers, two mediators, the psychologist and the manager of the Center's team discussed their work with the research team. The discussion lasted 2,5 hours and was recorded and later transcribed. One of the main conclusions drawn from the practitioners' experience was about the restrictions coming from the cultural background of the families. The participants in the focus group pointed out difficulties they faced in their work with Roma parents: parents' denial of a child's problem, their non-involvement in prescribed activities for the child at home, their distrust of professionals and their unrealistic expectations about fast outcomes.

"The child is fine" – this is a frequent answer of the mother; at first, they deny the child's problem, but then they sign a work agreement, despite it they may give up... (mediator, Community Center "Nadezhda")

Parents are very enthusiastic, but when it comes time for work – they pull back. (social worker, Community Center "Nadezhda")

Next, the practitioners put an emphasis on restrictions related to the child's problem, in particular, an increase of children with autism spectrum disorders and with communication problems and emotional negligence of children by their parents.

Today, neglect in children has a different character: children are fed, dressed, but lack emotional support,

communication and care. (psychologist, Community Center "Nadezhda")

The specialists talked comprehensively about the other group of barriers related to the cultural specificities of the Roma community. They pointed out that the low education and illiteracy of most of the parents resulted in the spread of negative attitudes, fears and prejudices toward specialists and people outside the community. The Roma family has preserved patriarchal relations and the opinions of the young parents are often denigrated by the older generation. The authority of old people and particularly mother-in-law is crucial in cases of decisions about a child's way of raising and development. The practitioners talked about their skills to motivate the influential people in the community, including mothers-in-law without whose consent the young mothers couldn't do anything about their child:

The Roma are very influenced by others, they began to take the children to the kindergarten and the change is immediately visible: the children become cleaner and neater. The same grandmother who was against now is the first to pay the fee, because the grandmother has found out that she is honored and she feels motivated to take the grandchildren to kindergarten. (social worker, Community Center "Nadezhda")

Reflecting on the dynamics of their communication with parents, the professionals assessed it in a positive way and concluded that parents turned out to be more accepting of the support services:

There is a huge progress in the attitude of parents – they are looking for us themselves, they are submitting applications, "unclogged", we were wondering how to make sure that parents recognize us. (team manager, Community Center "Nadezhda")

In a talk on the Center health prevention program, the professionals outlined the key role of mobile work and home visits to reach out the families in need:

What does health prevention involve? 90% is a mobile work – to find people without GPs and children who are served by GPs without a pediatric specialty to be sent to a pediatrician; how young mothers should take care of their child, because they look at them in old conservative ways – using fat, salt, tightening with ropes, etc. Still, there is a change. (psychologist, Community Center "Nadezhda")

The professionals were aware that because of the multidimensional character of poverty the Community Center should be responsive to a variety of Roma families' needs:

There is also a Family Center at the Community Center – in an apartment in a neighboring block, where the mother can leave her child for 2 hours free of charge while looking for work or submitting documents. The kindergarten seems scary to them as an institution, so the family center has the function of an intermediate link between the home and the kindergarten. (team manager, Community Center "Nadezhda")

In conclusion, in order to generalize the Community Center recommendations in regard to social assistance the professionals indicated three main facilitators to effective and long-term work with the families: provision of integrated services with multidisciplinary personnel, irreplaceable role of community mediators doing outreach and placement of the service provision center near the community (in the local kindergarten). The team manager outlined the paramount role of the kindergarten to find out and access parents in need:

And we decided through the parent meetings in the kindergarten – i.e. through the teachers. And there was a boom [of parents' referrals to the Center] – it began to be passed on between mothers. But for 1-2 years it was as if we were gone, and besides, the teachers did not allow us in their 'kitchen'... (team manager, Community Center "Nadezhda")

DISCUSSIONS AND CONCLUSIONS

Family support services are of crucial importance for families from vulnerable groups in order to ensure their normal access to the educational, health and social systems and to protect the child's best interest in parenting (Asmussen, 2017; Guerreiro & Sedletzki, 2016; Riding, 2021; McGregor & Devaney, 2020, p. 284) warn about complexity "to get the balance between responding to needs for prevention and early intervention and needs for protection and legal intervention".

Professionals in place who deliver services to vulnerable families are key factors in ensuring an effective integration of marginalized families from the Roma community. Their efforts are devoted to tackling the main problems of disadvantaged families like child abandonment and neglect of childcare. In granting their professional support (knowledge and skills) to child-raising in Roma families, the practitioners try to implement child protection policies at the local level, thus strengthening social services provision provided by the state-run Agency for Social Assistance.

The Bulgaria Report on Early Childhood Inclusion+ (RECI+, 2020) mentions the main challenges in service provision for marginalized families: insufficient

resources for service availability, unequal access of Roma children to health, education and social services, insufficient quality of ECEC, health, and social services that hinder Roma's inclusion, a piecemeal approach and lack of integrated and coordinated services, need for active parents' engagement with the ECEC providers. Parallel to structural barriers, the report also outlines discriminative attitudes that Roma faces in all areas including social services provision.

The survey on service providers' opinions which was conducted among 40 NGOs gives first-hand information about the constraints inherent in this field of work, most of which have been addressed by the RECI+ report. The survey results confirm our hypothesis that the main difficulties the professionals came across in their work concern convincing families to use the services, overcoming parents' unwillingness to cooperate with professionals and denying or neglecting the child's problem, overall, handling the discrepancy between user's expectations and delivered services. Parents are the main providers of care for their children, in this sense, the providers' skills to encourage parents' active involvement in services are of crucial importance for the effective impact of services on a child's development. The previous studies (Yossifov, et. al. 2018) show that the most effective way to reach out and communicate with families from marginalized communities is through establishing partnership relations based on equal respect and understanding and avoiding patronizing and didactic approaches. Our study results attest that the practitioners are aware of the cultural and language barriers as well as of discriminative attitudes that undermine their effective communication with Roma families. In this vein, increasing the number of Roma health and educational mediators and training programs with a focus on raising the status of the profession and qualifications to practice is crucial for the effective delivery of services. The case study with the Community Center 'Nadezhda' testifies that a multidisciplinary team of professionals, including community mediators is a valuable way to directly address Roma families through providing integrated services.

Alongside the challenges in family support provision, the survey data also outline the proactive solutions and the directions for improvement in the quality of services: development of interaction and partnership with families from vulnerable groups; networking with other institutions and organizations to provide non-fragmented services; increasing the number of educational and health mediators that will increase parents' motivation and encourage services take-up; providing integrated services in the community through mobile groups and fieldwork; overcoming prejudices and discriminative attitudes toward marginalized groups and raising the level of awareness of families toward delivered services and their effects on child's wellbeing.

REFERENCES

Abela, A., Dudova, R., Gabos, A., Haskova, H., Heggem Kojan, B., Kotzeva, T., Putnina, A., Sadic, S., Sesar, K., Tereskinas, A., Thiene, A., & Tzivian, L. (2021). *Child and Family Support Policies across Europe: National Reports from 27 Countries*. European Family Support Network. https://www.um.edu.mt/library/oar/handle/123456789/102252

Acquah, D., & Thévenon, O. (2020). Delivering Evidence Based Services for All Vulnerable Families. *OECD Social, Employment and Migration Working Papers, 243*. https://doi.org/10.1787/1815199X

Action plan for implementation of the Recommendation (EU) 2021/1004 of the Council for the creation of a European Guarantee for the Child (2030). (2022). https://www.strategy.bg/StrategicDocuments/View.aspx?lang=bg-BG&Id=1560 (In Bulgarian)

Asmussen, K., Waddell, S., Molloy, D., & Chowdry, H. (2017, October 31). *Commissioning parenting and family support for Troubled Families*. Report commissioned by the Department of Communities and Local Government. Early Intervention Foundation, London. https://www.eif.org.uk/report/commissioning-parenting-and-family-support-for-troubled-families

European Commission. (2021) *Proposal for a Council Recommendation establishing a European Child Guarantee*. Commission Staff Working Document. SWD 62 final. Brussels. https://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX:52021SC0062

Fernandes Guerreiro, A. I., & Sedletzki, V. (2016). *Children rights and social services*. Report on the implementation of the Council of Europe Recommendation on children's rights and social services friendly to children and families. Council of Europe. https://book.coe.int/en/children-s-rights-and-family-law/7081-pdf-children-s-rights-and-social-services.html

Kotzeva, T. (2021) Bulgaria: National report on Family Support Policy and Provision. In: Abela, A., Dudova, R., Gabos, A., Haskova, H., Heggem Kojan, B., Kotzeva, T., Putnina, A., Sadic, S., Sesar, K., Tereskinas, A., Thiene, A., & Tzivian, L. *Child and Family Support Policies across Europe: National Reports from 27 Countries* (pp. 125-166). European Family Support Network. https://www.um.edu.mt/library/oar/handle/123456789/102252

Markova, G., Manolova, H., & Hristova, M. (2018). Child Welfare Reform in Bulgaria – from Institutional to Family-Based Community Care: Engaging with Families, Children and Colleagues. *Journal of Intellectual Disability - Diagnosis and Treatment, 5,* 4, 130-136. https://doi.org/10.6000/2292-2598.2017.05.04.5

McGregor, C., & Devaney, C. (2020). Protective support and supportive protection for families "in the middle": Learning from the Irish context. *Child & Family Social Work, 25,* 2, 277-285. https://doi.org/10.1111/cfs.12683

National Statistical Institute Republic of Bulgaria. (NSI). (2021). *Poverty and Social Inclusion Indicators in 2020.* https://www.nsi.bg/sites/default/files/files/pressreleases/SILC2020_en_FRTG25T.pdf (In Bulgarian)

Nenova, G., Luleva, A., & Kotzeva, T. (2023). Caring for the Child, Caring for the Family: The Clash Over the National Strategy for the Child (2019-2030) in Bulgaria. *East European Politics and Societies and Cultures* (forthcoming)

Open Society Foundations. (2020). *Early Childhood in Roma Communities in Bulgaria.* Report on Roma inclusion in education, care, health and social services in ECEC in Bulgaria. RECI+ Report. https://osis.bg/wp-content/uploads/2021/02/RECI_Bulgaria-report_BG-2021-01-18-corr4.pdf (In Bulgarian)

Riding, S., Thévenon, O., Adema, W., & Dirwan, G. (2021). Looking beyond COVID-19: Strengthening family support services across the OECD. *OECD Social, Employment and Migration Working Papers,* 260, 1-88. https://doi.org/10.1787/86738ab2-en

Services for early childhood development (Ended), BG05M9OP001-2. Completed/terminated procedure (2020). Information System for Management and Monitoring of EU Funds in Bulgaria 2020. https://eumis2020.government.bg/en/s/Procedure/InfoEnded/2f608ff6-8e83-40b2-a78b-f01c379731da

Social Inclusion Project. (n.d.) Ministry of Labour and Social Policy. (Bulgaria) https://www.mlsp.government.bg/informatsiya-za-proekta

Thévenon, O. (2020). *Family Support Services across the OECD.* OECD Working Party on Social Policy

Todorova, V. (2019). Law regulation of family policies and suggestions for change in this type of law. In: Kotzeva, T., Dimitrova, E., Y. Zografova, Y. (Eds.). *Fertility and Family Policies. Measures to Cope the Demographic Crisis in Bulgaria* (Vol. I.). Sofia: Prof. M. Drinov Acad. Publishing House

UNICEF. (2019). *Analysis of the Child Protection System in Bulgaria.* Final report https://www.unicef.org/bulgaria/en/media/9361/file

UNICEF. (2023, January). *The State of Children in Europe and Central Asia.* https://www.unicef.org/bulgaria/media/16006/file/BGR-SOWC-Report-2023.pdf

UNICEF. (2022). *Un/Equal Childhood: Deep Dive in Child Poverty and Social Exclusion in Bulgaria.* https://www.unicef.org/bulgaria/en/documents/unequal-childhood-deep-dive-child-poverty-and-social-exclusion-bulgaria

World Bank. (2019). *Parenting Support-Key Transformational Instrument of Child and Human Development Policies-Trends in EU Countries and Discussion on Parenting Policies in Bulgaria.* http://documents1.worldbank.org/curated/en/164881565719073126/pdf/Parenting-Support-Key-Transformational-Instrument-of-Child-and-Human-Development-Policies-Trends-in-EU-Countries-and-Discussion-on-Parenting-Policies-in-Bulgaria.pdf (In Bulgarian)

Yossifov, Y., Banova, V., Zhupunov, L., Marinova, A., Kotzeva, T., Dimitrova, E., Moraliyska, S., Ilieva, K., & Gerginova, E. (2018). *Early Childhood Development in Bulgaria: A Study of the Systems Supporting Early Childhood Development, the Interaction and Cooperation Between Them and with Parents.* Sofia: For Our Children Foundation. (In Bulgarian)

FORECASTING THE QUARTERLY EVOLUTION OF BUDGET REVENUES IN MOLDOVA UTILIZING A TIME SERIES MODEL

DOI: https://doi.org/10.36004/nier.es.2023.1-10
JEL classification: C01, C22, H27, H68
UDC: 336.14:330.43(478)

Apostolos PAPAPHILIPPOU[1],
PhD in Economics, Four Assist Development Consulting Limited
https://orcid.org/0000-0002-2193-4035
e-mail: papaphilippou@4assist.eu

Received 3 April 2023
Accepted for publication 12 June 2023

[1]*The author holds a PhD in Economics from the University of Cambridge and is currently the Economic Development Planning Expert of the EU-funded Technical Assistance project "Support the Moldovan Government in identifying and preparing projects linked to the implementation of the Association Agreement". He is grateful to Ms Natalia Sclearuc of the Ministry of Finance of Moldova for providing him with the data and for interesting discussions on certain aspects of the budget process in Moldova. The graphs and econometric analysis contained in the paper have been generated using the EViews econometrics programme. The views expressed in the article are personal. E-mail address: papaphilippou@4assist.eu*

SUMMARY

The aim of the paper is to develop a time series model fitted on the quarterly evolution of total budget revenues in Moldova for monitoring and forecasting purposes. While the developed model is specific to Moldova it may be of interest to use the methodology discussed in the paper in order to develop similar time series models in other countries to serve as a benchmark for monitoring and forecasting budget revenues. Following a brief analysis of the properties and estimation of time series models, the paper presents the data set to be used for the estimation exercise, as well as analyse the data's stationarity and the correlogram of the stationary series to be modelled. The data sample comprises the quarterly evolution of total budget revenues in Moldova from the first quarter of 2016 to the first quarter of 2023. The paper proceeds to provide the econometric estimates of the preferred time series model, as well as use the estimated model to generate the forecast of the quarterly evolution of budget revenues from the second quarter of 2023 to the fourth quarter of 2024. The model's annual forecast of budget revenues for 2023 is slightly more optimistic than the Ministry of Finance's estimate for 2023 contained in the recently approved Medium Term Budget Framework document and is almost identical with the projection of the International Monetary Fund contained in its latest country report for Moldova. The paper concludes by summarising the uses and limitations of time series models for monitoring and forecasting purposes and suggesting areas for further work.

Keywords: *time series econometrics, auto-regressive integrated moving average models, budget revenues, Moldova*

Scopul acestui studiu este dezvoltarea unui model de serie temporală adaptat pentru analiza evoluţiei trimestriale a veniturilor bugetare totale din Moldova, cu scopul de monitorizare şi şi prognozare. Chiar dacă modelul dezvoltat este specific Moldovei, metodologia discutată în articol prezintă interes pentru dezvoltarea unor modele de serie temporală similare în alte ţări, care pot servi drept referinţă pentru monitorizarea şi prognozarea veniturilor bugetare.

După o analiză concisă a proprietăţilor şi estimărilor modelelor de serie temporală, studiul prezintă setul de date utilizat pentru procesul de estimare, precum şi analiza staţionarităţii datelor şi corelograma seriei staţionare, care urmează să fie modelată. Eşantionul de date cuprinde evoluţia trimestrială a veniturilor bugetare totale în Moldova, începând din primul trimestru al anului 2016 şi până în primul trimestru al anului 2023.

Articolul furnizează estimările econometrice ale modelului de serie temporală, precum şi este utilizat modelul estimat pentru a genera o prognoză a evoluţiei trimestriale a veniturilor bugetare din al doilea trimestru al anului 2023 până în al patrulea trimestru al anului 2024. Prognoza anuală a veniturilor bugetare, conform modelului pentru anul 2023, este puţin mai optimistă decât estimarea Ministerului Finanţelor pentru acelaşi an, conform Cadrului Bugetar pe Termen Mediu recent aprobat, şi este aproape identică cu proiecţia Fondului Monetar Internaţional prezentată în ultimul său raport de ţară pentru Moldova.

Studiul se încheie prin rezumarea posibilităţilor de utilizare şi a limitărilor modelelor de serie temporală în contextul monitorizării şi prognozării, precum şi prin formularea domeniilor pentru cercetări viitoare.

Cuvinte cheie: *econometrie în serii cronologice, modelul medie mobilă integrată autoregresivă, venituri bugetare, Moldova*

Цель данной статьи заключается в разработке модели временных рядов, специализированной для анализа квартальной динамики общих доходов бюджета Молдовы с целью мониторинга и прогнозирования. Несмотря на то, что данная модель специфична для Молдовы, описанная методология может быть полезной при разработке аналогичных моделей временных рядов в других странах, которые также будут использоваться для мониторинга и прогнозирования доходов бюджета.

После краткого анализа свойств и оценки моделей временных рядов в статье представлен набор данных, использованный для прогноза. Также проводится анализ стационарности данных и коррелограмма стационарного ряда, который подлежит моделированию. Этот набор данных включает в себя квартальную динамику общих доходов бюджета Молдовы с первого квартала 2016 года по первый квартал 2023 года.

В статье представлены результаты эконометрических оценок предпочтительной модели временных рядов, а также используется оценочная модель для формирования прогноза квартальной динамики доходов бюджета с второго квартала 2023 года по четвертый квартал 2024 года. Годовой прогноз доходов бюджета на 2023 год, полученный с использованием данной модели, немного более оптимистичен, чем официальный прогноз Министерства финансов на 2023 год, представленный в недавно утвержденном документе "Среднесрочные бюджетные рамки", и практически идентичен прогнозу Международного валютного фонда, представленному в последнем страновом отчете по Молдове.В заключение статьи

обобщаются возможности использования и ограничения моделей временных рядов для целей мониторинга и прогнозирования. Также предлагаются области для дальнейших исследований.

Ключевые слова: эконометрика временных рядов, интегрированная модель авторегрессии скользящего среднего, доходы бюджета, Молдова

INTRODUCTION

The actual and future evolution of total budget revenues in an economy is a critical variable for the design and conduct of economic policy and the maintenance of fiscal and debt sustainability. The aim of this paper is to develop and estimate a time series model fitted on the quarterly evolution of total budget revenues in Moldova and use the estimated model to generate short to medium-term forecasts. While the model developed in this article is specific to the case of the Moldovan economy, it may be of interest to use the methodology described in this article in order to develop similar time series models for other countries. These models could serve as a benchmark to assist analysts and forecasters in monitoring and forecasting the evolution of budget revenues.

The paper is organised as follows: Following a brief analysis of the characteristics and estimation of time series models, the paper presents the data set to be used for the estimation and the data's stationarity and the correlogram of the stationary series to be modelled. This is followed by a section which includes the econometric analysis and the estimates of the preferred time series model, as well as the forecast of the quarterly evolution of budget revenues in Moldova from the second quarter of 2023 to the fourth quarter of 2024. A table therein compares the forecasted annual budget revenues for 2023 and 2024 of the model with the forecasts by the Ministry of Finance contained in the recently approved Medium-Term Budget Framework document and the forecasts contained in the latest International Monetary Fund country report for Moldova. The paper concludes by summarising the uses and limitations of time series models and suggesting areas for further work.

A NOTE ON TIME SERIES MODELS

The origin of time series econometrics is the seminal work of Box and Jenkins (1970). The current section provides an overview of the properties of time series models focusing on the methodology of analysing and estimating the so-called Auto-Regressive Integrated Moving Average (ARIMA) models.

It is well-known that ARIMA models are widely used in empirical work for analytical and forecasting purposes. Even though ARIMA models are typically a-theoretical they have proved to be very useful instruments in order:

1. To provide insight and analyse the underlying data-generating process of the particular time series under investigation; and/or

2. To generate forecasts of the analysed time series. As a rule the forecasts generated by ARIMA models are frequently used as benchmarks: the ARIMA- generated forecasts are taken into account and are combined with other economic indicators, analysis and professional judgement on the combined effect of a number of economic variables and the structural characteristics of the economy under consideration and its external environment in order to arrive at a reliable forecast of the time series in question.

ARIMA models are linear models which incorporate an autoregressive dynamic process and a moving average dynamic process. Given any time series variable, yt:

1. An Auto-Regressive (AR) process is a process where the current value of yt is a function of its own past values and an error term, ut:

2. $y_t = f(y_{t-1}, y_{t-2}, \ldots) + u_t$.

3. A Moving Average (MA) process is a process where the contemporaneous value of yt is a function of the past as well as contemporaneous values of the error term, ut

4. $y_t = g(u_{t-1}, u_{t-2}, \ldots) + u_t$.

We now turn to the issue of the stationarity of the time series under analysis. The initial step in developing an ARIMA model is to ensure that the time series that will be modelled is stationary or, in other words, that the series to be fitted by an ARIMA model does not contain a unit root. This is because it is well-known that a non-stationary time-series may give rise to spurious (i.e false) regressions. A time-series that follows a stationary process has the property that its mean, variance and autocorrelation structure is finite and constant over time.

The stationarity of a time series is tested through the use of a number of statistical tests. If the time series under scrutiny is not stationary then, following the Box and Jenkins (1970) methodology, the first difference of the time series under consideration is taken and the resulting time series is subsequently tested for stationarity. This differencing process is repeated until the resulting time series is stationary. The number of times the time series under analysis has to be differenced in order to arrive at a stationary time series determines the so-called order of integration of the ARIMA model.

In general any ARIMA model could be characterised by a vector of three numbers (p,d,q), where:

- p refers to the number of lags in the AR process in the estimated model;
- d refers to the order of integration (i.e. the number of times the time-series under analysis needs to be differenced in order to eventually obtain a stationary series); and
- q is the number of lags in the MA process in the estimated model.

At the identification stage of the ARIMA model's specification, the researcher seeks also to analyse briefly the property of the time series under investigation. The model's identification process requires the exercise of informed judgement supplemented by a number of diagnostic tools and tests to assist in the analysis. Graphs of the autocorrelation and partial autocorrelation functions of the time series are frequently employed in order to facilitate the determination of the number of lags in modelling the AR and/or the MA process in the specified ARIMA model. Both the autocorrelation and partial autocorrelation functions are summarised in the correlogram of the time series under investigation, which displays the autocorrelation and partial autocorrelation functions up to the specified number of lags. In particular:

- the autocorrelation function displays the coefficients of correlation between a time series and time lags of the same series, while.
- by partial autocorrelation we refer to the correlation between a variable and a lag of itself that is not explained by the correlations of all lower-order-lags.

It is notable that:

- The typical correlogram of a pure AR process is characterised by a geometrically decaying autocorrelation function, while the partial auto-correlation function drops to zero after a number of time lags. The spikes in the partial autocorrelation function are indicative of the AR order to be introduced in the ARIMA model's specification;
- In a typical pure MA process the number of spikes in the autocorrelation function is indicative of the MA order to be introduced in the ARIMA specification. The correlogram of a typical MA process is characterised by a geometrically decaying partial autocorrelation function and an autocorrelation function that drops to zero after a few lags.
- Finally, if the correlogram of the time series under investigation is characterised by geometrically decaying autocorrelation and partial auto-correlation functions, this may be indicative that a mixed AR and MA process may be the appropriate specification.

In general the aim of the ARIMA model identification and selection process is to arrive at a specified ARIMA model that:

- Is parsimonious, or, in other words, as simple as possible; and
- Passes the diagnostic tests that are used to assess the overall fit of the specified regression equation.

Now a parsimonious ARIMA model is desirable because:

- Including irrelevant time-lags in the model's specification increases the coefficient standard errors (and therefore reduces their t-statistics and their statistical relevance).
- Regression models that incorporate large numbers of time-lags, tend not to forecast very well. This is because such models are likely to over-fit data-specific features of the data under estimation (by explaining much of the random features in the data set under investigation rather than providing a more efficient reflection of the underlying data generating process).

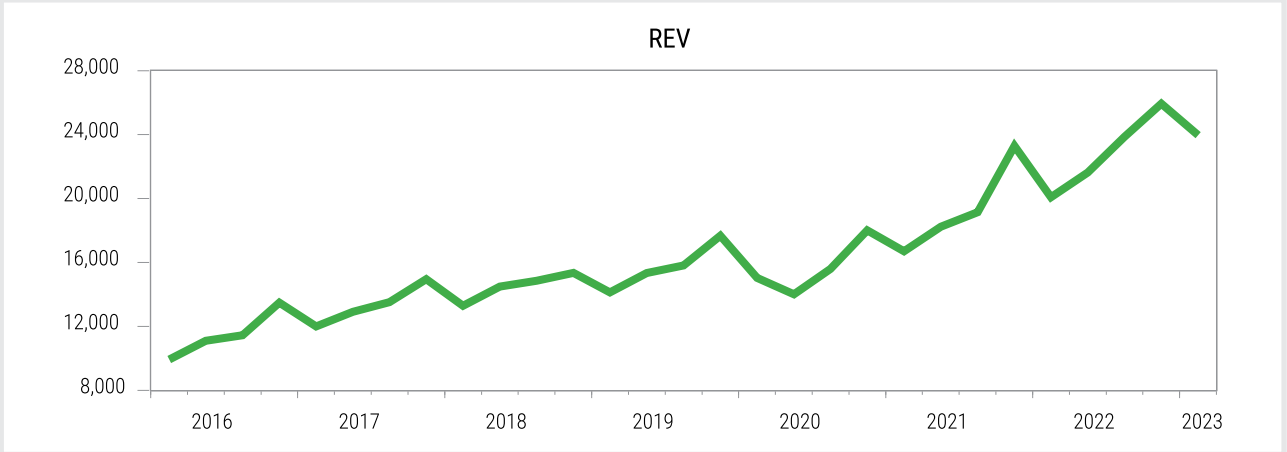
It is notable that in the estimation and testing steps of the ARIMA's model development a number of descriptive statistics and statistical tests are used to assist the analysis, the ARIMA model selection and its validation. These tests include also information criteria (such as the Akaike information criterion and the Schwarz criterion) that are used to compare different alternative regression specifications and balance: (1) the goodness of fit requirement of the specified regression; with (2) the need for a parsimonious (i.e. simple) specification.

DATA, STATIONARITY AND THE CORRELOGRAM

The data to be used for the econometric analysis in the paper is the quarterly evolution of total budget revenues in Moldova from the first quarter of 2016 to the first quarter of 2023. The data are reproduced in the paper's appendix. Graph 1 below provides a visual representation of the evolution of budget revenues over the period.

Graph 1:

Graph of the quarterly evolution of budget revenues from the first quarter of 2016 to the first quarter of 2023



Source: Ministry of Finance.
Note: The numbers are in millions of Moldovan lei.

Tables 1 and 2 below report the stationarity tests of the budget revenues time series itself and its first difference respectively. Both series are nonstationary.

Table 1.

Stationarity test of the time series
Null Hypothesis: REV has a unit root

Exogenous: Constant
Lag Length: 4 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.132553	0.9966
Test critical values:	1% level	-3.737853	
	5% level	-2.991878	
	10% level	-2.635542	

**MacKinnon (1996) one-sided p-values.*
Source: EViews-generated estimates

Table 2.

Stationarity test of the first difference of the time series
Null Hypothesis: D(REV) has a unit root

Exogenous: Constant
Lag Length: 3 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.575736	0.4791
Test critical values:	1% level	-3.737853	
	5% level	-2.991878	
	10% level	-2.635542	

**MacKinnon (1996) one-sided p-values..*
Source: EViews-generated estimates

On the other hand table 3 below provides firm evidence that the second difference of the budget revenues time series is stationary.

Table 3.

Stationarity test of the second difference of the time series
Null Hypothesis: D(REV,2) has a unit root

Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.98663	0.0000
Test critical values:	1% level	-3.737853	
	5% level	-2.991878	
	10% level	-2.635542	

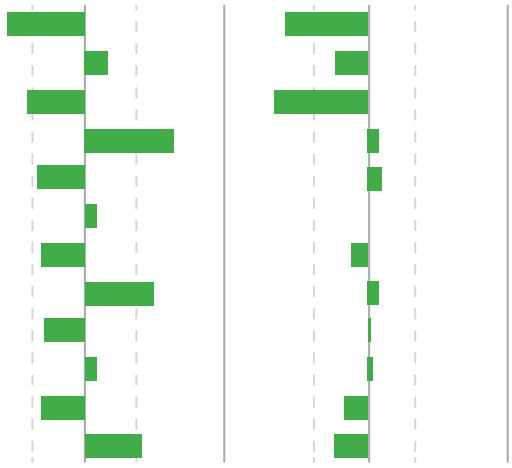
**MacKinnon (1996) one-sided p-values..*
Source: EViews-generated estimates

Table 4 below reproduces the correlogram of the second difference of the budget revenues time series.

Table 4.

Correlogram of the second difference of the time series.

Sample: 2016Q1 2027Q4
Included observation: 27



	AC	PAC	Q-Stat	Prob
1	-0.563	-0.563	9.5486	0.002
2	0.161	-0.228	10.364	0.006
3	-0.417	-0.671	16.051	0.001
4	0.648	0.083	30.349	0.000
5	-0.349	0.114	34.694	0.000
6	0.095	-0.003	35.032	0.000
7	-0.313	-0.114	38.877	0.000
8	0.507	0.089	49.484	0.000
9	-0.283	0.024	52.977	0.000
10	0.092	0.027	53.365	0.000
11	-0.311	-0.155	58.092	0.000
12	0.403	-0.209	66.561	0.000

Source: EViews-generated estimates

The partial correlation function depicted in table 4 is characterised by three spikes in the first three lags, with the spikes from the fourth lag onwards being much less significant. This indicates that a possible ARIMA model specification to be estimated may include the first three ar lags.

The autocorrelation function in table 4 is more difficult to characterise. There are spikes in the first, third and fourth lag, but it is not apparent how to succinctly characterise the general evolution of the function besides noting that the spikes seem to slowly decrease from the fifth lag onwards (albeit it with a significant spike in lag 8). As the previous section of the paper indicated the spikes in the autocorrelation function may be indicative of the possible inclusion of ma terms in the regression model to be estimated. The possible inclusion of ma terms in the ARIMA model's specification is further analysed through statistical tests which are reported in the following section.

ECONOMETRIC ESTIMATES AND FORECASTS

The above-mentioned analysis of the partial correlation function suggests that the (3,2,0) model may be a good starting point for the econometric investigation. Table 5 below reproduces the regression results of the (3,2,0) model.

Table 5.
Regression results of the (3,2,0) model

Dependent Variable: D(REV,2)
Method: Least Squares
Sample (adjusted): 2017Q2 2023Q1
Included observations: 24 after adjustments
Convergence achieved after 4 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.22616	65.51823	0.293447	0.7722
AR(1)	-1.043593	0.122095	-8.547416	0.0000
AR(2)	-1.021039	0.151022	-6.760861	0.0000
AR(3)	-0.884974	0.121355	-7.292440	0.0000
R-squared	0.834282	Mean dependent var		-19.96250
Adjusted R-squared	0.809425	S.D. dependent var		2902.713
S.E. of regression	1267.178	Akaike info criterion		17.27798
Sum squared resid	32114778	Schwarz criterion		17.47433
Log likelihood	-203.3358	Hannan-Quinn criter.		17.33007
F-statistic	33.56239	Durbin-Watson stat		2.297964
Prob(F-statistic)	0.000000			

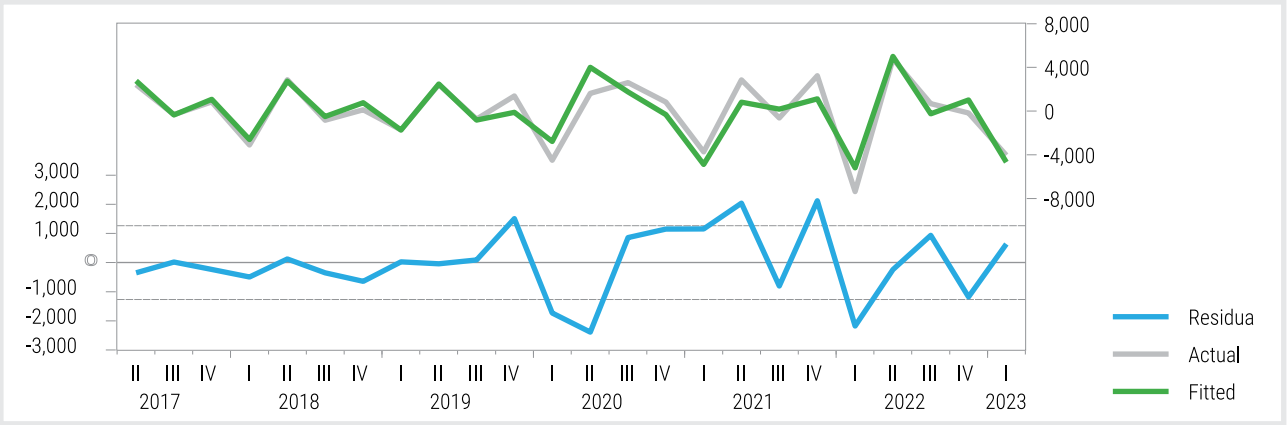
Source: EViews-generated estimates

Despite the relatively small sample size the overall fit of the regression reported in table 5 is quite good with the model explaining more than 83% of the total variation of the dependent variable, and with all three ar regression terms being highly statistically significant. On the other hand, the regression's constant term is not significant.

Graph 2 below depicts the actual, fitted and residuals graph of the regression of the (3,2,0) model. It is notable that the largest deviation between the actual and fitted values occurred in the second quarter of 2020 reflecting the adverse impact of the COVID-19 pandemic on the economy in general and Moldova's fiscal aggregates including its budget revenues in particular.

Graph 2:

Actual, fitted and residuals graph of the regression reported in table 5



Source: EViews-generated estimates

The advantage of the estimated (3,2,0) model is its good overall fit and its simplicity. Furthermore, it is notable that the addition of ma terms in the regression does not improve the estimation results. More specifically the addition of a ma (1) term in the regression reported in table 5 gives rise to a regression outcome where the ma (1) term is not statistically significant, while the overall fit of the resulting (3,2,1) model deteriorates when compared with the original (3,2,0) model, which has also the additional advantage of being simpler[2]. The regression results of both the (3,2,2) and (3,23) models report that the estimated ar process is nonstationary.

We proceed to generate short to medium term forecasts of the estimated (3,2,0) model. Table 6 below contains the estimated model's dynamic forecasts of the quarterly evolution of budget revenues from the second quarter of 2023 to the fourth quarter of 2024.

Table 6.

Forecasts of the quarterly evolution of budget revenues from the second quarter of 2023 to the fourth quarter of 2024 generated by the (3,2,0) model

2023Q2	25854.21
2023Q3	28065.80
2023Q4	29653.40
2024Q1	28224.37
2024Q2	30368.40
2024Q3	32491.86
2024Q4	33734.12

Source: EViews-generated estimates

Now it is well known that the short-term forecasts of a time series model are more reliable than its forecasts over longer periods (which become increasingly uncertain as the forecast horizon expands). It follows that the quarterly estimates for 2023 in table 6 above are more reliable than the quarterly estimates for 2024. I shall return to this point at the end of the current section.

A natural question which arises concerns the comparison of the budget forecasts generated by the estimated (3,2,0) time series model with other forecasts by national and/or international institutions.

Of particular importance for the design and conduct of fiscal policy in Moldova are the forecasts of the Ministry of Finance of Moldova. With regard to the methodology used by the Ministry of Finance, it is notable that it uses the effective rate methodology and relies heavily on a professional judgement which takes into account all the relevant variables and the available information, as well as the impact of the changes in economic policy and the structural reform programme over the forecasting period. Moldova's fiscal policy in the medium-term is analysed in the recently approved Medium-Term Budget Framework for 2024-2026 (Ministry of Finance, 2023b). At the same time Moldova's reform programme in the area of Public Financial Management is analysed in the Public Financial Management Strategy 2023-2030 document (Ministry of Finance of Moldova, 2023a).

[2] *The regression results of the (3,2,1) model are included in the paper's appendix. When compared with the simpler (3,2,0) model, the (3,2,1) model fits the data less well as indicated by a comparison of the adjusted R-squared, the Akaike information criterion and the Schwarz criterion.*

[2] *According to the International Monetary Fund's Manual on Fiscal Transparency under the effective rate approach "the forecast for each tax is made by multiplying a forecast of the tax base by the corresponding effective tax rate. The effective tax rate is calculated by dividing the tax collected for the most recently available period by the estimated tax base. For transparency, it is necessary to disclose the way in which the effective tax rate is calculated, the economic assumptions underlying the tax base forecast, and any adjustments that are made to reflect any of the aforementioned changes" (International Monetary Fund, 2007, p. 38).*

Table 7 below reports the recent annual forecasts of the Ministry of Finance of Moldova, the recent forecasts of the International Monetary Fund, as well as the forecasts of the estimated (3,2,0) time series model for the years 2023 and 2024.

Table 7.
Selected forecasts of budget revenues in Moldova for 2023 and 2024

	2023	2024
Ministry of Finance	100659	105398
International Monetary Fund	106886	111518
Forecasts from the estimated (3,2,0) model	107542	124819

Source: Ministry of Finance, International Monetary Fund and own calculations

Note: The numbers in the table are in millions of Moldovan lei. The Ministry of Finance numbers are contained in the recently approved Medium-Term Budget Framework for 2024-2026 and comprise the latest budget amendment for 2023 and the Ministry's forecast for 2024 (Ministry of Finance, 2023b). The International Monetary Fund numbers are taken from the latest country report for Moldova and comprise the projection of revenues and grants for 2023 and the forecast for 2024 (International Monetary Fund, 2023, p. 33). The forecasts from the estimated (3,2,0) model are rounded estimates based on the actual budget revenues for the first quarter of 2023 and the quarterly forecasts contained in table 6 above.

The forecasts of the estimated (3,2,0) model are more optimistic, especially for 2024. One possible reason may be that, over the forecasting period to the end of 2024, inflation in Moldova is expected to decelerate significantly as indicated by the latest Inflation Report of the National Bank (National Bank of Moldova, 2023). And while the expected inflationary process is taken into account in the forecasts of the two institutions, it is exogenous to the forecast generated by the time series model (which relies exclusively upon the actual historical path of the data).

My second comment brings us back to the above-mentioned property of the time series model regarding the short term forecast being more reliable than the forecast over a longer time period. Focusing upon 2023, the forecast generated by the estimated time series model is only slightly more optimistic that the forecast of the Ministry of Finance and almost identical with the projection of the International Monetary Fund.

CONCLUSION AND SUGGESTIONS FOR FURTHER WORK

As the paper has emphasised the forecasts of time series models are, at best, only useful as benchmarks and an additional tool in the forecasting process. The forecast of any time series model cannot (and should not) replace the need for the exercise of professional judgement and the prudent assessment of all the available information by the forecasters.

A natural area for further work would be to expand the data sample by including earlier observations. This may well increase the efficiency of the econometric analysis and the generated econometric estimates and forecasts.

A straightforward extension would be to include in the regression equation three seasonal dummy variables to capture the inherent seasonality of the Moldovan economy. The expanded data set would allow a more efficient assessment of the extended model's forecasting ability in comparison with the original specification. It is notable that, with the existing data set, the inclusion of the three seasonal dummy variables improves the regression's fit as captured by the adjusted R-squared, the Akaike information criterion and the Schwarz criterion. Furthermore it should also be noted that the annual forecasts for 2023 and 2024 of budget revenues of the extended model are very close to those generated by the simple (3,2,0) model reported in table 7 above. The results of the estimation of the extended model with the three seasonal dummy variables appear at the end of the paper's appendix which also includes the out-of-sample forecasts of the extended model to the end of 2024.

Looking forward another closely related area for further work would be to update the analysis, econometric estimates and forecasts of the estimated model as new data become available through time. This will render the time series model a useful instrument for monitoring and forecasting purposes.

REFERENCES

Box, G., & Jenkins, G. (1970). *Time Series Analysis: Forecasting and Control*. San Francisco: Holden-Day. https://books.google.md/books/about/Time_Series_Analysis.html?id=5BVfnXaq030C&redir_esc=y

International Monetary Fund. (2007). *Manual on Fiscal Transparency*. Washington, D. C.: International Monetary Fund. https://www.imf.org/external/np/pp/2007/eng/101907m.pdf

International Monetary Fund. (2023). Republic of Moldova: Third Review Under the Extended Credit Facility and the Extended Fund Facility Arrangements, and Request for a Waiver for Nonobservance of Performance Criterion - Press Release; Staff Report; and Statement by the Executive Director for Republic of Moldova. *IMF Country Report*, 152. https://www.imf.md/press/SR_1MDAEA2023003.pdf

Ministry of Finance of Moldova. (2023a). P*ublic Financial Management Strategy 2023-2030*. https://www.legis.md/cautare/getResults?doc_id=135819&lang=ro

Ministry of Finance of Moldova. (2023b). *Medium Term Budget Framework 2024-2026*. https://particip.gov.md/ro/document/stages/proiectul-hotararii-de-guvern-privind-aprobarea-cadrului-bugetar-pe-termen-mediu-2024-2026-cbtm/10590

National Bank of Moldova. (2023). *Inflation Report*, (2) https://www.bnm.md/files/RI_mai_2023_ISBN.pdf

APPENDIX

Data set

Data set					
2016Q1	9925.000	**2018Q3**	14858.60	**2021Q1**	16698.80
2016Q2	11103.00	**2018Q4**	15350.10	**2021Q2**	18234.40
2016Q3	11443.10	**2019Q1**	14128.30	**2021Q3**	19143.60
2016Q4	13482.80	**2019Q2**	15338.90	**2021Q4**	23296.20
2017Q1	11993.20	**2019Q3**	15811.40	**2022Q1**	20075.90
2017Q2	12916.00	**2019Q4**	17670.60	**2022Q2**	21627.40
2017Q3	13516.30	**2020Q1**	15029.60	**2022Q3**	23865.20
2017Q4	14953.90	**2020Q2**	14008.10	**2022Q4**	25936.90
2018Q1	13291.60	**2020Q3**	15597.60	**2023Q1**	23968.20
2018Q2	14495.60	**2020Q4**	18014.70		

Source: Ministry of Finance.
Note: The estimates are in millions of Moldovan lei.

Regression results of the (3,2,1) model

Dependent Variable: D(REV,2)
Method: Least Squares
Sample (adjusted): 2017Q2 2023Q1
Included observations: 24 after adjustments
Convergence achieved after 7 iterations
MA Backcast: 2017Q1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	18.69594	51.24176	0.364857	0.7192
AR(1)	-0.964616	0.150725	-6.399818	0.0000
AR(2)	-0.957388	0.167202	-5.725918	0.0000
AR(3)	-0.859721	0.136927	-6.278693	0.0000
MA(1)	-0.266968	0.255714	-1.044010	0.3096

R-squared	0.841190	**Mean dependent var**	-19.96250
Adjusted R-squared	0.807756	**S.D. dependent var**	2902.713
S.E. of regression	1272.714	**Akaike info criterion**	17.31874
Sum squared resid	30776194	**Schwarz criterion**	17.56417
Log likelihood	-202.8249	**Hannan-Quinn criter.**	17.38385
F-statistic	25.15988	**Durbin-Watson stat**	1.975773
Prob(F-statistic)	0.000000		

Source: EViews-generated estimates.

Regression results of the (3,2,0) model with the addition of seasonal dummy variables

In the regression below the variable q2 takes the value of 1 in the second quarter and of 0 in the other three quarters. Similarly, the variable q3 takes the value of 1 in the third quarter and of 0 in the other three quarters and the variable q4 takes the value of 1 in the fourth quarter and of 0 in the other three quarters.

Dependent Variable: D(REV,2)
Method: Least Squares
Sample (adjusted): 2017Q2 2023Q1
Included observations: 24 after adjustments
Convergence achieved after 9 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-608.7553	500.3477	-1.216665	0.2404
Q2	370.1220	718.7205	0.514974	0.6132
Q3	4074.718	1092.984	3.728066	0.0017
Q4	-1887.787	1247.761	-1.512939	0.1487
AR(1)	-1.199017	0.206965	-5.793344	0.0000
AR(2)	-0.801234	0.308065	-2.600862	0.0186
AR(3)	-0.571511	0.205040	-2.787315	0.0126

R-squared	0.872097	**Mean dependent var**	-19.96250
Adjusted R-squared	0.826955	**S.D. dependent var**	2902.713
S.E. of regression	1207.492	**Akaike info criterion**	17.26897
Sum squared resid	24786625	**Schwarz criterion**	17.61257
Log likelihood	-200.2277	**Hannan-Quinn criter.**	17.36013
F-statistic	19.31884	**Durbin-Watson stat**	2.029049
Prob(F-statistic)	0.000001		

Inverted AR Roots -.11-.76i -.11+.76i -.98

Source: EViews-generated estimates.

As noted in the paper's section on areas for further work the inclusion of the three seasonal dummy variables improves the regression's overall fit as captured by the adjusted R-squared, the Akaike information criterion and the Schwarz criterion. However only the seasonal dummy variable for the third quarter is highly statistically significant.

The table below contains out-of-sample forecasts of the quarterly evolution of budget revenues from the second quarter of 2023 to the fourth quarter of 2024 generated by the extended (3,2,0) model with the incorporation of seasonal dummy variables.

2023Q2	25596.84
2023Q3	27509.73
2023Q4	29628.71
2024Q1	28255.43
2024Q2	29753.83
2024Q3	31754.65
2024Q4	33968.14

Source: EViews-generated estimates.

Finally the table below reproduces table 7 in the main text and adds another raw containing the forecast of the annual revenues estimated by the extended (3,2,0) model with the incorporation of seasonal dummy variables rounded to the first integer.

	2023	2024
Ministry of Finance	100659	105398
International Monetary Fund	106886	111518
Forecasts from the estimated (3,2,0) model	107542	124819
Forecasts from the estimated (3,2,0) model with seasonal dummy variables	106704	123732

Source: EMinistry of Finance, International Monetary Fund and own calculations

The annual forecasts of the extended (3,2,0) model with the incorporation of seasonal dummy variables are very close to the forecasts generated by the simple (3,2,0) model (which remain the highest in the table).

It should be stressed that a more complete analysis of the efficiency of the econometric estimates and the extended model's forecasting ability will require a larger data set and will become possible when earlier data are included in the data set.

REGULATIONS

of publication scientific articles in „Economy and Sociology" journal, category B+, indexed in international databases

Presentation of the manuscript and decision on publication

Authors wishing to publish articles in the Economy and Sociology journal are asked to send manuscripts electronically to incemd.redactie.es@gmail.com.

They can also be mailed or handed over to the editorial board on paper and in electronic form. Manuscripts run the peer-review process and the authors get a response in about 4 weeks.

By sending the manuscript to the editorial office, the responsible author confirms that he has read and agrees with the ethics of publication published in the journal Economy and Sociology.

All the manuscripts received are reviewed by the editorial staff in terms of meeting the formal requirements of the journal. Articles that do not match the journal's topic and are not written in accordance with the journal's rules are not accepted for review, and the respective notice is sent to the author.

The articles accepted for examination are discussed at the editorial board meeting where the reviewers are appointed.

After reviewing the article (peer review, double blind), the comments and objections of the reviewers and the Editorial board are sent to the author with a proposal to make corrections to them or to repeatedly submit the article. If the manuscript is not accepted for publication, a motivational refusal is sent to the author.

After the article is accepted, the author must send the editorial (if any) files with diagrams and data for them.

The finally print

The layout of the articles accepted for publication (after review and final drafting by authors) is sent to the authors for the fine print. The authors are asked to reply to the editorial office within 3 days. The authors receive 1 copy of the article (extracted in pdf).

Agreement for publication

The copyright for published articles belongs to the National Institute for Economic Research. Reprinting of the materials is possible only with the Editorial board's approval. Authors submitting articles to the editorial office implicitly declare their consent under these conditions.

Access to the contents of the journal

Access to the contents of the magazine is free on-line, the print version can be purchased with payment to the NIER Editorial Complex, including the order sent to the applicants or by subscription.

The editor of the journal, the National Institute for Economic Research, performs the electronic backup copy and will provide access to the contents of the journal if it will not be published.

Submissions

are accepted all year round with the current waiting time of max. 6 months.

There are no author fees or charges required for manuscript processing and/or publishing.

TECHNICAL INSTRUCTIONS

The article structure:

TITLE of article: English, Romanian, Russian

THE DATA ON AUTHOR/AUTHORS: *Name Surname, scientific degree, scientific title, institution (without abbreviations), in: English, Romanian and Russian* with a footnote at the first page of the article: ©Name Surname (author), e-mail.

THE ABSTRACT will contain actuality, aim of the research, main methods of researching, and the most relevant obtained results from the research in English, Romanian and Russian.

KEYWORDS: *6-8 keywords in English, Romanian and Russian.*

JEL Classification (Journal of Economic Literature Classification System: https://www.aeaweb.org/econlit/jelCodes.php)

Articles should be structured in the following sections:

1. INTRODUCTION (the argumentation of the actuality of the research/research problem)
2. LITERATURE REVIEW
3. DATA SOURCES AND USED METHODS
4. THE RESULTS OF OWN RESEARCH AND DISCUSSIONS
5. CONCLUSIONS
6. REFERENCES: up to 30 sources

Typing rules

- The form of basic text: A4 (edges: 20x20x20x20 mm); Times New Roman; 12pt; line spacing – 1,5, left-right alignment, the paragraph 10 mm
- The article title (centered, in capitals, 12pt.)
- The author of the article (right alignment, bold, italic), the last name of the author with capitals, 12pt.
- The abstract (left-right alignment, italic, paragraph 10 mm, 12pt. (250 words)
- Keywords (left-right alignment, italic, paragraph 10 mm, 12pt.
- JEL Classification (right alignment, bold, italic, 12pt.)
- The work will contain 10-15 pages (from 25 to 40 thousands signs)
- Graphic elements (tables and figures) must be elaborated by author, have high quality (color), will be placed, directly, after concerned reference in the text. All the elements, mandatory, shall be accompanied by name and order number (above the table, below the figure), source and, as needed, additional information: note, legend (underneath the element).
- Bibliographic references are placed at the end of the article (Name, surname initial, title, editor, year, pages, ISSN). In the text shall be indicated bibliographical references, which include the name of the author and the year the publication was published (i.e., (Kessel, 2010), (Hinde, 1998; Pullum, 2004), (Eurostat, 2015). The reference page must be indicated by a colon (Rachkov, 2011:213).

Review.

All the supplies, submitted for publication in „Economy and Sociology" journal, are subject to the review „double-blind review system" by Editorial board.

Detailed information on the publishing process can be found at

https://es.ince.md/index.php/Economy_and_Sociology

Good to print: 30.01.2023. Circulation 100 ex.
Editorial sheets: 10.0
Editorial Service of INCE, 2023

Editor's address:
National Institute of Economic Research
Ion Creanga Street, 45, mun. Chisinau, MD-2064

E-mail: incemd.redactie.es@gmail.com
Website: https://economy-sociology.ince.md
Tel.: + 373 22 501130

9 772587 418004 >

Adress: NIER, MD-2064, mun. Chisinau, str. Ion Creanga, 45
tel. 022-50-11-30, fax.: 022-74-37-94, web: www.ince.md
website: economy-sociology.ince.md