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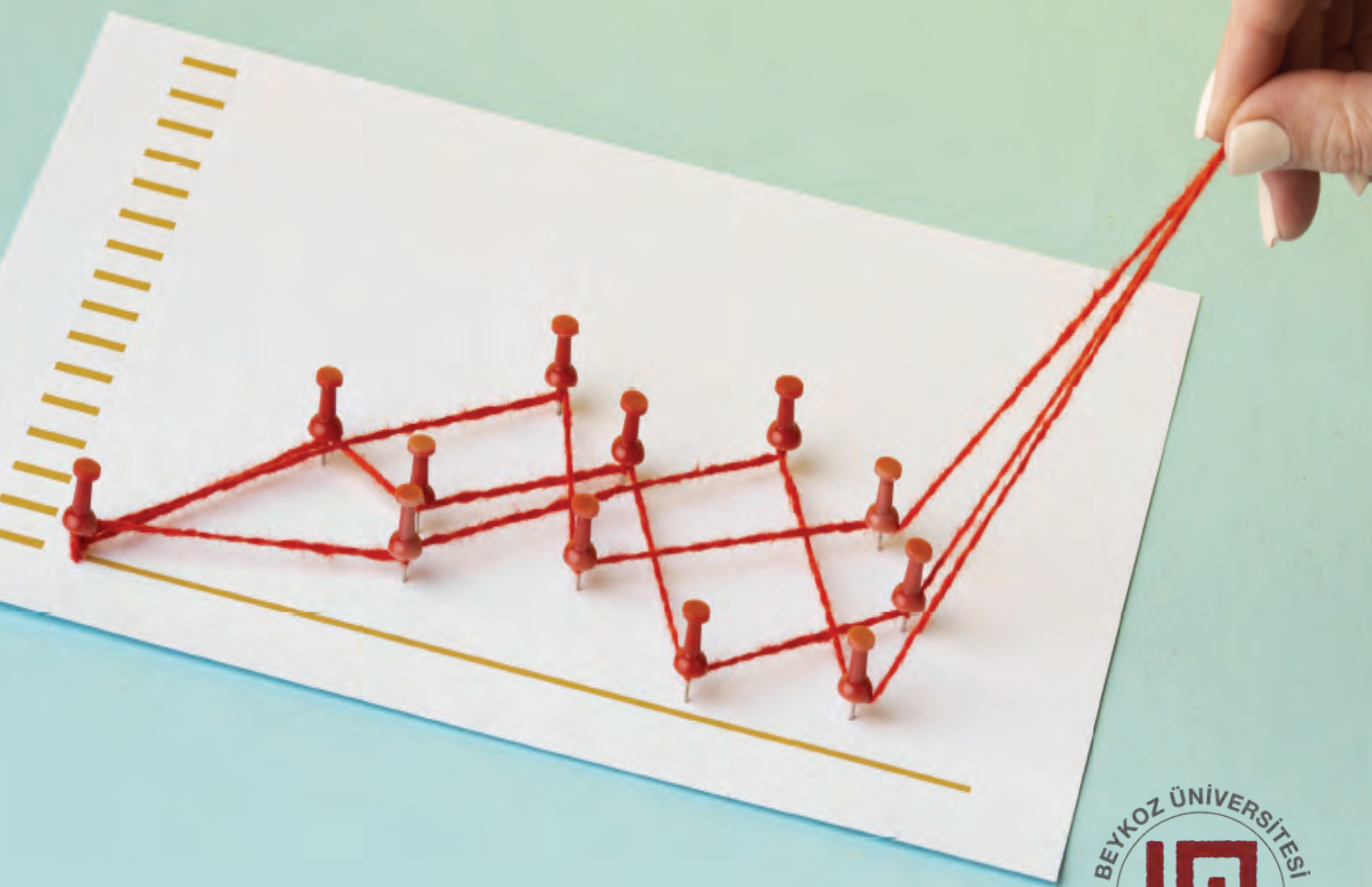
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INTERNATIONAL CONFERENCE ON POLITICAL ECONOMY

# ABSTRACTS & PROCEEDINGS

"Inflation, Employment, and Inequality"



# ICOPEC ABSTRACTS & PROCEEDINGS

14. International Conference on Political Economy (ICOPEC2023@İstanbul)  
December 14-15, 2023, İstanbul, Turkey  
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**"Inflation, Employment, and Inequality"**

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14. International Conference on Political Economy

**Inflation, Employment, and Inequality**

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**Inflation, Employment, and Inequality**



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# ABSTRACTS

## Comparison of the Development of Labor and Capital Income in Turkey's Top 1000 Companies Between 1982-2023

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The aim of this study is to reveal whether there is a general trend by comparing labor and capital income between 1982 and 2023, using the data set of the Istanbul Chamber of Industry's Turkey's Top 500 and Second 500 Largest Industrial Enterprises Survey. In addition, it is to determine in which sub-period there was a radical change in labor and capital income. The companies included in this study produce 25.7 percent of Turkey's industrial value-added, 8.4 percent of its gross domestic product, and also make 39.8 percent of Turkey's industrial exports. Therefore, the findings obtained from this study using the data set of ISO 1000 companies are important as they will contribute to understanding the development of the shares of labor and capital income across Turkey. The methods used in this study are as follows: The ISO 1000 data set was created by combining two studies conducted by the Istanbul Chamber of Industry. The study covers the period between 1982 and 2023 and is examined in five sub-periods. In this context, the development of real values of labor and capital incomes is compared. The shares of labor and capital income in net added value are evaluated according to sub-periods. In addition, based on the concept of surplus value in Marxist literature, the annual surplus-value of the ISO 1000 Companies is calculated and the development of surplus value according to sub-periods is examined. In the last part of the study, the findings are discussed and some policy recommendations are made.

*Key Words: Political economy, Turkey's Top 500 and Second 500 Industrial Enterprises, Labor and Capital Income, Surplus-Value in Turkey.*

## **Macroeconomic Dynamics Affecting the FX Position of Individuals and Non-Financial Firms in Türkiye**

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In the past few years, foreign currency-denominated asset and liability holdings of households and corporations have increased to record levels in Turkey. While economic agents generally take such financial positions to secure themselves against currency risks and to gain an economic return, dollarization may restrain the effectiveness of monetary policy and increase the fragility of the financial system. Therefore, understanding the motivations for holding foreign-currency-denominated assets is important for policymakers. In this paper, we aim to identify the determinants of foreign exchange positions of households and non-financial firms in Türkiye. Using autoregressive distributed lag (ARDL) and vector autoregression (VAR) models in our analysis, we find that inflation, the exchange rate, interest rate spreads between the domestic currency and foreign currency deposits, and volatility in international financial markets are significant in households' decisions for holding foreign exchange deposits. For non-financial firms, inflation, dollar spot index, USD-TRY one-month implied volatility, and cost of funding are negatively correlated with holding foreign currency-denominated assets; while it is positively correlated with the REER, FX credits by the banking sector, and imports.

## **Inflation and Monetary Policy in Turkey during the 21st Century**

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After trying many different monetary regimes, Turkey implemented a floating exchange rate and inflation targeting regime after the 2001 crisis. Changing economic environment and policy preferences over time brought about significant deviations from this structure. In this study, we evaluate the stages of monetary policy in the 21st century within the perspective of global and local developments. The results of monetary policies implemented especially after September 2021 and their impact on inflation dynamics are evaluated in the context of conventional macroeconomic theories. In the light of these experiences, some lessons and policy implications are presented.

## Nanotechnology and Artificial Intelligence: A Patent Review

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Nanotechnologies are the material basis of the disruptive technologies that make up the so-called Industry 4.0. Their multipurpose and multifunctional characteristics have made possible their application in various areas, including artificial intelligence, as they increase information processing capacity and connectivity between connection points: by means of nanometric devices, it has been possible to generate intelligent software in ever smaller processors. The link between nanotechnologies and artificial intelligence is an area of research that promotes the generation of broader technological developments with diverse applications. This paper aims to make an exploratory analysis of patents in nanotechnology with applications in artificial intelligence that have been registered in recent years in order to distinguish regional trends and areas of application.

*Note: This text is part of the Science Frontier research project #304320 Funded by the National Council on Humanities, Science and Technology (CONAHCYT) of Mexico.*

## Circular Economy In Kosovo And Oecd Policies As A Model

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Nowadays, countries are shifting from linear economy to circular economy to increase economic growth and environmental protection. This shifting requires financial funds and wide awareness for benefits of environmental protection and represents a challenge for countries in transition. In this case, a strategy for developing countries could have been the following of the policies implemented by developed countries. This paper studies the opportunities, challenges, and benefits of the circular economy in Kosovo. The methodology applied in this paper includes the summary of findings and publications from the country's institutions, international organizations, and other authors. Kosovo has so far taken several steps in the implementation of the circular economy in the country through the issuance of laws, international agreements, and projects by international organizations. However, there is still work to be performed before the implementation and full extraction of the significant benefits that the circular economy can bring. Three econometric models for the implementation of the circular economy from OECD countries are also included in the paper for comparison, in order to suggest political models which could be followed by Kosovo and other developing countries.

## **Commercialization of Textile Products: The Impact of Transnational Fast Fashion in Mexico**

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Informal textile trade is a globalized socioeconomic phenomenon whose impact on the Mexican textile industry has generated imbalances in its production processes and sales volume. Tons of textile merchandise known colloquially as "bales" that come mainly from the United States of America, are distributed throughout the country without the supervision or control of the authorities through smuggling and large-scale distribution, and whose commercialization has increased exponentially in recent years. After the economic closure due to the COVID-19 pandemic, we find an industry that has diversified not only in the public markets or clothing stores but also in the digital space, creating an informal infrastructure that has allowed it to survive, maintain, and develop.

## **The State and Banking Sector Relationship in Financialisation: Recent Developments in the Turkish Economy**

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In the past few years, the economic policy stance in the Turkish economy, more particularly the monetary policy trajectory, has been criticised by various circles. While the government has taken steps prioritising economic growth, employment and exports, largely due to political concerns, the banking sector has been at the centre of policy implementation. The Turkish economy has been going through financialisation over the last few decades, and the banking sector has had a central position in this transformation. Financialisation, in both the core and the periphery, has led to significant changes in the conduct of financial and nonfinancial companies, households, and certainly, of the state. This is also what has happened in the Turkish economy. As the state plays a critical role in capital accumulation by setting the rules of the game, overlooking the functioning of the system, resolving conflicts, and more directly, implementing economic policies, its actions and preferences have impacts on the behaviour of economic actors during financialisation. This study focuses on the relationship between the state and the banking sector in the Turkish economy and aims to investigate the implications of the recent economic policy measures for the latter.

*Keywords: Turkish economy, peripheral financialisation, macroprudential tools, monetary policy, banking sector*



## **The Impact of Inflation on Ottoman Waqfs**

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This study focuses on the impact of the inflation on Ottoman endowments, commonly referred to as waqfs. It is crucial to emphasize that the Ottoman economy operated within a coinage system. Initially, it adhered to bimetallic system until 1477 when gold coins introduced for the first time. The official currency of the Ottoman Empire was the akçe, silver coin, which maintained the status until the seventeenth century. Concurrently, European nations were experiencing substantial commercial growth during the same period, and the discovery of America led to a significant influx of gold and silver. This influx, in turn, triggered price increases and inflation. The closed nature of the Ottoman economy could not shield it from the impact of these global changes. Research has shown that from the sixteenth century onwards, the silver content of akçe decreased while prices increased within Ottoman Empire. This study is dedicated to exploring the question of how inflation affected the waqf institution within the Empire in the seventeenth century using the archival records, belonging to the waqfs, in the Ottoman Archives. The waqf institution played a fundamental role in Ottoman society, providing a wide range of services from education to healthcare. It employed thousands of individuals across the empire, offering them regular salaries. This research seeks to explore the response of inflation on this essential institution, which played a crucial role in organizing and sustaining various aspects of social life.

## Social implications of Artificial Intelligence in education

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Artificial intelligence, in conjunction with other disruptive technologies characteristic of the "Fourth Industrial Revolution," is rapidly transforming numerous industries, including the educational sector. These technologies accompanied the exacerbation of inequalities. The extraction and appropriation of our data available on the Internet serve as the raw material for training artificial intelligence systems, which tends to favor the dynamics of privatization and commodification of general social knowledge. This study aims to examine the social implications of Artificial Intelligence (AI) in educational processes. The working hypothesis suggests that if AI is based on past information, it tends to reproduce existing social patterns, overlooking potential and creative alternatives. The study seeks to reveal, from an educational standpoint, the impact of AI on new schemes of accumulation that originate in the digital space but have significant implications in the political, social, normative, and developmental realms.

*Note: This text is part of the Science Frontier research project #304320 Funded by the National Council on Humanities, Science and Technology (CONAHCYT) of Mexico.*

## **Social Sustainability In Logistics Businesses: Content Analysis of Sustainability Reports**

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In the dynamic landscape of the logistics sector in Türkiye, the imperative to integrate social sustainability practices has become increasingly apparent. This study embarks on a focused exploration into the social sustainability dimensions of Turkish logistics companies, dissecting their sustainability reports to discern the extent and nature of their commitment to social responsibility. As the logistics industry plays a pivotal role in the intricate network connecting production to consumption, understanding and enhancing its social impact is crucial for fostering a more responsible and resilient business ecosystem. The research employs a qualitative approach, utilizing content analysis through document examination to scrutinize expressions related to the social sustainability dimension in sustainability reports of logistics companies in Türkiye. In conclusion, the findings underscore a prevalent trend in Turkish logistics companies where sustainability reports, while acknowledging the social dimension, exhibit a limited scope in social sustainability indicators. This observation suggests a potential inclination towards utilizing these reports for promotional purposes rather than as comprehensive documentation of actual social sustainability practices. Moreover, the study highlights the critical need for conceptual clarity in understanding sustainability terms, emphasizing the nuanced distinctions among "Corporate Sustainability," "Corporate Social Responsibility," and "Social Sustainability" for a more informed and targeted approach to sustainable business practices. The research's outcomes offer valuable contributions for business managers, stakeholders, and the academic community.

*Keywords: Social sustainability, sustainability reporting, sustainable logistics.*

## Fostering Green Growth in Africa

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Green growth refers to economic progress that is environmentally sustainable. This study examines the impact of green innovation, renewable energy consumption, and institutional quality on green growth in African countries, controlling for GDP per capita, trade openness, foreign direct investment (FDI), population, and natural resource rent. The short- and long-run relationships are investigated using the Pooled Mean Group model with panel data for 48 African countries from 2000 to 2021. The findings reveal that green innovation, renewable energy consumption, institutional quality, GDP per capita, trade openness, and population growth have positive long-run effects on green growth. In contrast, FDI and natural resource depletion have adverse effects. In the short run, only institutional quality and GDP per capita positively affect green growth, while natural resource depletion has a negative impact. These results suggest that in order to foster green growth in Africa, policymakers should prioritize improving institutional quality, promote green innovation, and induce the adoption of energy-efficient technologies.

## The Effect of the Global Energy Crisis After the Russia-Ukraine War on Energy Markets

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Just as all resources in the world are limited, energy resources are also limited. On the other hand, energy demand has increased most of the time. Especially after World War II, energy consumption and demand began to increase rapidly. Developments such as the development of technology, industrialization, transportation, infrastructure and increase in international trade have been effective in increasing energy demand. Both supply and demand imbalance and political, military or economic events in the international arena have affected the energy markets. While production and energy demand decreased during the Covid-19 epidemic in recent years, production and energy demand began to increase rapidly as the epidemic lost its effect in the world. With the Russia-Ukraine war that started on February 24, 2022, EU countries, which especially meet their energy needs from Russia, have turned to other supply sources to meet their energy needs. The aim of this study is to examine how EU countries responded to the energy crisis that emerged with the Russia-Ukraine war, through demand, substitution and supply, using the descriptive analysis method. While the share of Russia among the countries from which the EU supplies energy products decreased, the share of Norway, Saudi Arabia and the USA in oil, and the share of Norway, Algeria and the United Kingdom in natural gas increased. The share of Norway, Qatar and Algeria in the EU's liquefied natural gas (LNG) imports has increased.

*Keywords: Energy, Energy Crisis, Energy Supply.*

**Behavioral Managerial Accounting:  
Cost Behavior, Cognitive Biases, Predictability and Control**

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The advent of the behavioral aspect in accounting and finance highlights the recognition that investors and managers do not always act rationally. Decision-making processes are acknowledged to be influenced by a combination of rationality and emotions. In this behavioral perspective, individual biases can impact managers, hindering them from making decisions solely on a rational basis. The objective of this paper is to provide a literature review of the main studies performed in the field of behavioral managerial accounting; in particular, the relationship between the behavior of costs, the cognitive biases individuals utilize, the accuracy of cost prediction and control issues. The paper starts by giving a historical review of the origins of behavioral managerial accounting, the first studies conducted in this field, then it continues to review the main studies performed about the effect of cognitive biases on cost behavior, cost predictability and control issues. Although this paper itself is not an empirical research, it provides insights into the main research performed. It draws the attention of academicians to the most important considerations to think about when performing further studies in the future.

## Nanotechnology and Artificial Intelligence as a Challenge for Developemnt

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Integrating artificial intelligence with nanotechnology represents a challenge to the progress and development of the Global South. Especially when considering that industrialized countries lead the entire value chain of these emerging technologies, that is, research and development (R&D), manufacture, and commercialization. However, the challenge is more significant when considering the articulation of these strategic technologies in transversal economic sectors that may imply an amplification of socioeconomic inequalities between the countries of the center and the periphery. In this paper, we discuss the implications of furthering the convergence of artificial intelligence and nanotechnology from a critical perspective.

## The Evolution of Digital Platforms

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At a time when we are witnessing a deepening of what some authors call platform capitalism, this article sets out to periodize the evolution of digital platforms. We propose to reconstruct the history of these platforms, from their etymological origin to the process of their massive diffusion in the context of the "digital transformation" of current business models. This periodization seeks to highlight the main qualitative leaps made by the technologies of the "digital platforms" and to show the fundamental trends of their evolution. The text aims to insert this technological evolution within global economic trends, showing the relationship of mutual determination between economic and technological dynamics.

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## **Power of State through Economic Revival (on the Example of Russia)**

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The main problems of Russian foreign policy in the 90s and 2000s of the last century were weakness of the state power, distrust of foreign partners and foreign debt. The attitude of the international community towards Russia was largely determined by its huge foreign debt and unstable economic situation. For January 1, 2000, Russia's debt amounted to about 60% of the country's GDP. The main direction of Russian foreign policy in 2000-2006 was a solution to financial problems. Thus, having solved the financial problems, Russia finally managed to return to the stage of world politics and carve out its own niche in the international arena. This is evidenced by the fact that in 2006 the country chaired the G8. Openly declares and consistently defends its national and geopolitical interests. Debt relief allowed the Russian authorities to confidently defend their position in dialogue with the West. Putin was able to regain Russia's lost positions and create a more or less strong and accountable state, thorough financial revival.

*Keywords: Russia, Foreign debt, Economic power, Revival*

## **The Effectiveness of Monetary Policy: Inflation Rates Low and Economic Growth in Mexico**

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The reduction of inflation in Mexico in the 1980s and 1990s was raised as one of the priority objectives of economic policy to boost economic growth, in a critical economic and social scenario for this country. The historically high levels of external indebtedness not only meant an internal crisis but would also impact the solvency of the main creditors. Rising government deficits, rising unemployment, and enlargement forced a rethinking of economic policy that led to an economic transformation to maintain access to international credit. In recent decades, monetary policy became an instrument that aimed to ensure conditions to promote macroeconomic stability and reduce fluctuations in economic activity and employment. Although at the beginning, during the last two decades of the 20th century it seemed that reducing inflation was the only objective to be achieved. The objective of the article is to announce how, through the management of the transmission channels of monetary policy, such as interest rates, credit, asset prices, the exchange rate, risk taking and expectations of inflation, the aim has been to maintain stable inflation and has managed to reverse the lag in economic growth. At the center of the discussion, inflation and its undeniable influence on the price formation process is taken into consideration.

## Turkish Bank Customers' Intention to Use Payment Rings

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Nowadays, we witness rapid developments in information and communication technologies every day. Technological developments, one of the most important dynamics of the age, deeply affect and transform country economies and individuals' lifestyles. Companies are constantly working to make new inventions or improve their existing technologies in line with their goals such as providing solutions to today's complex problems, increasing company performance and gaining competitive advantage. Recently, we see that 'wearable technologies' have started to be used in many sectors, from education to health, from industry to science, to increase information access and make human life easier, accelerating digital transformation. Generally, there are wearable technology products in different forms such as smart watches, smart glasses, and smart jewelry on the market. In this study, the 'payment ring' example, which is one of the wearable technology examples, is discussed. As soon as bank customers bring their payment ring, which is an example of new generation payment technologies, close to the POS device, the wearable payment device automatically works and they can complete their shopping contactlessly -pin less. The study was designed to understand the intention to use and expectations of bank customers in Türkiye regarding payment rings.

*Keywords: wearable technology ,intention to use, marketing, artificial intelligence.*

## **Internal Linkages Between Prices (Commodities, Exchange Rate, Money and Labour): Structural Components of Inflation in Turkey**

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In a sense, the discipline of economics has been built on prices and internal linkages between prices. The Hicks-Hansen model (IS-LM) is one of the important efforts in this direction. Although it is separated into real and monetary terms, economic truth is analysed in terms of prices. Even if it is described as "degenerated Keynesian analysis" in the literature, we are systematically confronted with the fetishistic articulation of prices. Since the starting point of the IS-LM model is "rational economic agents", prices meet at the equilibrium point. The problem is determined within the equilibrium paradigm. Let us try to bring the analysis a little closer to reality. Let us move the prices (prices, wages, interest rates, exchange rates) and the markets that determine these prices to the functioning, that is, to the capital accumulation based on the nation-state backed industry. We will analyse the inflation phenomenon through prices and markets that have gained their content. If the rational behaviour of the actors keeping the markets in equilibrium does not determine prices under equilibrium conditions, what can be the source of the increase in the general price level of commodities (in the sense of products)? Or what is it intended to be? Are price determinations and the phenomenon of inflation subject to the same functioning in late capitalist societies in which markets are in the process of formation as they are in the conditions when the markets necessary for capital accumulation are competent and mature? How can the links between prices be analysed through inflation, especially in the ongoing process of articulation to markets (commodity, labour-power, money) on a world scale? Analysing these and similar questions through Turkey as an economy in late capital accumulation will be the main determinant of the presentation.

**| ABSTRACTS & PROCEEDINGS |**

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**Precision Medicine in the Context of Current and Potential Contradictions**

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Precision medicine is a research area that has attracted much attention in recent years. The aim of this paper is to frame the development of precision medicine in the context of current and potential social, political, and economic contradictions. In this context, a comparative historical methodology is applied, supported by studies of philosophers and historians of medicine. The first part of the paper is devoted to the analysis of the current situation in the field of precision diagnostics, focusing on the current state of the art of the field. The second part is focused on the study of the progress in precision medicine. From a public health perspective and given the arguments presented, it is likely that personalized medicine will lead to greater inequality between countries and regions and within different social sectors.

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## **A New Inflation Measurement Approach and the Effects of Inflation on Corporate Debt, Financial Statements and Tax Policies**

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Recently, a sticky and stubborn inflation process has been experienced in the US, Europe and locally in Turkey. The inflationary environment has pushed many central banks to raise interest rates. All developed economies measure inflation from the sampling basket they have created. In Turkey, TurkStat is the main authority for inflation measurement. Recently, inflation measurement approaches have been the subject of debate due to high inflation. In our study, we will first try to determine an approach to inflation from the net sales growth measurements of stock exchange companies in the last 3 years. In the second stage, various effects of inflation on financial statements are analysed. In an inflationary environment, many foreign investors and many international institutions demand that the balance sheet and income statement be measured with inflation effects in order for Turkey to be removed from the grey list. In this respect, Turkey plans to adopt inflation accounting in 2024. In the third stage, the borrowing tendencies of many companies in an inflationary environment were analysed. Since debts shrink in real terms in an inflationary environment, this can be considered as a strategy in borrowing policies. Finally, inflation also has an impact on tax policies through profitability and tax revenues. As a result, our study presents a different measure of inflation and analyses the effects of inflation on financial statements, borrowing habits of companies and tax policies. In our study, the data of companies traded in Borsa İstanbul are used.

## **The Importance of the Corruption Parameter as an Economic Development Component**

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While there is an abundance of scientific studies on how economic development can take place, there are comparatively fewer examinations focused on the factors that sustain continuous economic development. In this study, based on Peter Evans' classification of the state, the focus is on the question of the areas in which developmental states, independent of the policies they initially pursued, are still successful today. Thus, within the framework of the relationship between development and corruption, the Corruption Perceptions Index, an international data source, has been utilized to compare selected examples from these states. Ultimately, it has been observed that, as indicated by Evans, developmental states exhibit low corruption perceptions, while mediocre states tend to have high corruption perceptions. Similarly, the phenomenon of a decline in political corruption has been identified in developmental states that correspond to the prosperity period characterized by Walt Whitman Rostow as the final stage of development. The indicators presented in the study carry traces of strong connections between corruption and economic development on a country-specific basis. Additionally, the study emphasizes the development of a bureaucracy based on a meritocratic foundation as a means to address politically corrupt forms of corruption, highlighting the necessity for administrators and all stakeholders in society to adopt a resolute stance against corruption.

## Implications of Artificial Intelligence on Employment in Developing Nations

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The rapid advancement of Artificial Intelligence (AI) technologies has triggered a paradigm shift in the global job market, with profound implications for both developed and developing nations. While AI has the potential to boost productivity and economic growth, it also raises concerns about job displacement and inequality. This study explores the multifaceted implications of AI on employment in developing nations, considering its impact on various sectors, skill sets, and policy responses. By analyzing the current landscape and future trends, this work aims to provide a comprehensive understanding of the challenges and opportunities that AI presents for developing economies.



## **Is the Fisher or Neo-Fisher Effect Valid in Asian Countries? A Panel Data Analysis on the Causality between Inflation and Interest Rates**

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Nowadays, most of the central banks apply inflation targeting policy, so one of the most debated issues in the economy is the relationship between inflation and interest rate. This study aims to examine the Fischer hypothesis, which suggests that nominal interest rates move with inflation in the long run, and the Neo-Fischer hypothesis, which suggests that nominal interest rates have a determinant effect on inflation rates in the long run, in 30 Asian countries. Annual inflation and interest rate data for the period 2002-2022 are obtained from the World Bank and International Monetary Fund databases. Using the cross-sectional dependence test, the delta test and the Emirmahmutoglu-Köse panel causality test, on the one hand, the results of the cross-sectional dependence tests are used to estimate the existence of interdependence between cross-sections, and on the other hand, the results of the panel causality tests are used to investigate the Fischer and Neo-Fischer effects country by country. The causality analyses show that the number of countries with an effect of interest rates on the inflation rate is higher than the number of countries with an effect of inflation on interest rates. In other words, it is concluded that the Neo-Fisher effect is more valid in this analysis of 30 Asian countries.

## Islamic Funds to Reducing Inequality in Terms of Ethical Investment

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The aspect of Islamic pension funds, which are among the religious-based funds to reducing inequality in society will be emphasized. Participation pension funds in Türkiye operate according to Islamic principles and provide services in accordance with international interest-free finance standards. In the research, participation pension funds in Türkiye were compared with interest-bearing pension funds, and it was determined that the average performance efficiency of participation pension funds was higher than interest-bearing pension investment funds. When the returns were compared, it was determined that there was no loss of return in participation funds compared to interest-bearing funds. Participation funds' avoidance of alcohol, harmful products to health, harmful behaviours to social morality, war-arms industry, interest-bearing financial products contribute to reducing social inequality. It contributes to ensuring economic efficiency in general, based on the effectiveness of the risk-adjusted returns of participation funds. In addition, it allows resources to be distributed more effectively, instead of directing them to production points that are harmful to health, social morality, and world peace. Interest-free financial products based on dividend sharing instead of financial products containing fixed-return interest contribute to ensuring income justice. Instead of alcohol production and war industry etc. companies' stocks, resource allocation is based on Islamic financial principles that to ensure prosperity. Ethical investment as socially responsible, environmental social and management investment, sustainable investment, impact investment, and religious-based investment funds are all contributor for social development and sustainable environment. Participation funds as religious-based investment funds contribute to social welfare, equal sharing of income that prevent waste.

## **Housing Sector and Its Contribution to the Economy: A General Evaluation from the Republic to 2023**

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The dynamic development of the construction industry in Turkey has played a central role in shaping the country's socio-economic landscape over the past century. From its formative stages during the founding of the Republic to its current state of dynamic growth and innovation, the sector has remained an indomitable force driving Turkey's economic progress, skilfully responding to shifts in the political environment and embracing a range of cutting-edge technological advances along its transformative journey. The housing sector, which often acts as a lever for national economies through the value added and employment opportunities it generates, is of particular importance. The Turkish housing sector, which relies heavily on national capital, has a significant impact on the employment and production process as it involves hundreds of occupational branches. This study evaluates the place of housing policy in economic policies in general from the Republic to 2023.

*Keywords: Housing Sector, Economy of Housing, Housing Sector in Turkey.*

## The Impact of Creative Destruction on Inequality

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The influence of creative destruction on business activity and economic development is enormous. In the era of speedy innovations and technological progress it contributes to the overall process of transformation of economic activities. Meanwhile, creative destruction challenges also the social dimension by destroying obsolete jobs and creating new ones. The major challenge for countries with low levels of innovation is to manage to implement the requisites of creative destruction and increase the levels of innovation while at the same time balance the income levels in specific regions. This can be done through developing mechanisms for increasing skills and the acquisition of new competencies among the local population. Local communities have to support SMEs and to envisage the implementation of innovations in parallel to the education of the human resource, focusing on the importance of increasing education, skills and qualification levels.

## **Academic Training in Nanotechnology in Mexico: Ignored Risks and Technical Education**

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The current moment of capitalism has found in nanotechnologies the possibility of dynamizing the productive trajectory of all economic sectors; from new inputs such as materials, products, applications, etc. Mexico is one of the leading countries in Latin America in the advancement of nanotechnologies, only after Brazil, considering human resources, infrastructure, financing and publications. In the area of higher education, there are many Higher Education Institutions (HEI) that offer programs in nanotechnology. A total of 61 programs have been identified, of which 31 offer bachelor's degrees, 8 offer university technical degrees, 11 offer master's degrees and 11 offer doctorates. The design of the curricula has a technical orientation in accordance with the guidelines imposed by productive or commercial interests. The content of topics such as risks are limited and not very relevant in most of the programs, a situation that evidences a notable omission given that there is a broad debate on the intrinsic risks of certain nanomaterials or nanotechnology applications.

## Misery Index and Inequality: An Empirical Reassessment

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The Misery Index (MI), which was invented by Arthur Okun, measures the economic health of an economy. This index helps to get a general idea about the economic situation of an average citizen in a country by combining the inflation rate with the unemployment rate. This study aims to investigate whether there is a relationship between MI, which reflects the general course of economic life, and income inequality, which is another indicator of economic discomfort. In this context, this paper tests the long-run relationship between the MI and income inequality (top income share) in Turkey over the 1980 – 2022 period, by using an augmented autoregressive distributed lag (ARDL) testing approach. The analysis results support that there is a long-term relationship between MI and income inequality in Turkey (1980 – 2022).

## Drug Addiction and Damoclis Gladius

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The paper discusses the history of drugs starts from the distant past, the historical path of drugs is full of drama. In this way, the interdependence of people and drugs in general is noteworthy. The existence of drugs is recognized as ancient as human social behavior. However, the most ancient period is associated with a psychoactive plant that was used as a drug as a sleeping aid. Their number includes the following - bhang, a love potion, a means of actively conducting mystical rituals. As mentioned above, human psynarcotics have been known since ancient times. It is assumed that its past coincides with the origin of the human race. It is known that several clans formed a tribe, tribes - a community. In every community there were customs and habits to take measures that would change the current situation. They were swallowed, chewed, inhaled, and now they are also injected. According to scientists, the drug was discovered in southern Europe, which is confirmed by archaeological excavations near Lake Constance. This gave reason to historians to assume that there must have been known plantations of narcotic plants as early as the Bronze Age. This is proven even by the fact that traces of such plantations have been found on the territory of today's Switzerland. Scientists suggest that as early as five thousand years ago, the Sumerians living in the lands of Lower Mesopotamia (now the territory of modern Iraq) were drug users, and the named plant was the poppy. A clear confirmation of this was the results of the archaeological excavations that took place in the Sumerian city of Nippur. The recommendations for preparation and consumption of opium were read on the clay tablets found as a result of the excavation. In the Sumerian language it was called "Gil", which meant "joy".

## Foreign Currency and Employment Generation Potentials of Agrotourism Activities

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Turkey has high potentials for tourism because many ancient civilizations left their mark on this country. Turkey has a variety of fascinating historical sites. It also has the advantage of offering three different climates for different types of tourist activities. Currently, Turkey attracts tourists mainly to its seaside resorts. However, it also has a large potential for agrotourism that may integrate tourism with agriculture. Agrotourism may increase foreign currency earnings and create additional employment. This paper investigates the ways in which agrotourism may increase foreign currency earnings and employment, focusing particularly on possible investment schemes that may be designed by the state.

*Keywords: Agriculture Sector, Tourism Sector, Agrotourism*



## E-Voting - International Experience and Georgia

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The process of digitization is actively under way in the modern era, and technological advancements have altered every aspect of society. The use of special electronic technologies in elections is commonplace globally, with a number of countries using new voting technologies to improve the traditional way of voting. For developing democracies like Georgia, the use of contemporary technologies in the electoral process is crucial. In this context, this study discusses examples of the implementation of electronic technologies in elections around the world, their characteristics, advantages, and disadvantages, as well as the legal regulations for the use of New Voting Technologies (NVT). There are multiple different configurations of electronic elections. The article identifies three main election procedures that can be automated using technology: 1) voter identification; 2) voting; and 3) vote counting. The study is focused on the start of a new stage of modernization in the electoral process in Georgia, considering the upcoming parliamentary elections will be held using electronic technologies.

*Keywords: E-voting, New Voting Technologies (NVT), Elections.*

**Local Self-Government:  
An Important Challenge of Democracy (Case of Georgia)**

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To establish democracy in modern Georgia, it is important to share European experience in different directions. According to the European Charter, local self-government has the right and opportunity to organize and manage a significant part of public affairs within the framework of the law, under their own responsibility, following the interests of the local population. The local self-government ensures the unity of the people and the government, and the good management provided by it is a benefit for all citizens. Therefore, it is relevant to study the issue based on the interest of establishing democracy in Georgia. The aim of the presented paper is to study a number of measures taken to establish local democracy and self-government in Georgia based on official documents and sources. Since these laws include a number of processes starting from the adoption of the "Organic Law of Local Government and Self-Government" - the refinement of the legislative base. Moreover, they cover local elections and related challenges, efforts towards decentralization, and the steps taken by the Georgian government to establish the rule of law and good governance practices in the country, to facilitate the relationship between local government and the population, and to encourage cooperation with the central government.

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## **Understanding Precision Agriculture in the Path of Previous Agricultural Technological Revolutions**

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This text addresses the intersection between nanotechnology and agriculture, challenging its promises. From a historical perspective, the paper examines how technological innovations were developed in agriculture as a technical solution to overcome problems ranging from food to raw materials. However, the market profitability imperative does not prioritize social needs but economic benefits. The research explores the lessons learned from the green revolution and agricultural biotechnology, considering them as examples to understand the direction of nanotechnology in what is nowadays called precision agriculture. Despite the high expectations of solving food and other problems, these advances are far from avoiding systemic capitalist trends that shape the relationship between nanotechnology and agriculture.

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**CSR and Signalling Effect:  
Case of USA, Turkey and Kazakhstan**

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What signals do companies in developing economies send to stakeholders when they adopt corporate social responsibility (CSR) practices? We argue that firms adopting CSR practices in emerging economies positively signal investors that their firms have superior abilities. We note that CSR practices in developing countries are more salient than in developed ones. Our study attempts to compare the CSR practices of firms from developing and developed countries. Our sample consisted of firms from three countries, which are USA, Turkey and Kazakhstan.

*Keywords: Corporate Social responsibility, Sustainability, Stakeholders, stock exchange, Environmental, social, and corporate governance, emerging, developed countries*

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**Inflation, Unemployment, and Inequality 50 Years After**

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The oil shock of 1973, after the 2nd Arab Israeli War, stopped almost 30 years of continuous growth in the West, the longest period of prosperity ever observed in capitalist economies and for that reason it was rightfully characterized as “les trente glorieuses”. Inflation, Unemployment and especially Inequality followed in the decades after, despite the recovery of the new-globalisation era after 1990. In February 2022, the Russian invasion of Ukraine provoked a new oil and natural gas shock in developed countries, triggering an inflationary spiral. The aim of this communication is to examine the similarities and the differences between the two external shocks to the international economic order and use historical evaluation as a method of prediction.

## Self-Determination to Promote Science and Technology for Development: A Proposal from Latin America

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After the Second World War, science and technology (S&T) took a key place on the agendas of the main governments, it was believed that the area had the capacity to encourage economic development by creating competitive advantages. At first, the idea of using S&T as an engine for development was applied only in the most industrialized countries. However, upon noticing that the war not only left considerable human and social losses in its wake, but also caused an economic debacle that had repercussions throughout the world, it forced economies to design strategies that would allow them to accelerate their economic and social recovery. In this way, based on the experience of developed countries regarding the use of science, technology and innovation (CT&I), as a tool to encourage economic and social progress, various international organizations recommended that less advanced countries promote the area in order to access to development, preserving the idea that underdevelopment was a previous stage and that its transition could be expedited by increasing investment in this area. By contrast, the proposal of autonomous development arises in Latin America, or also called self-determination of development, which offers a development model that differs from the linear one, since underdevelopment is not seen as a stage prior to development, which by reproducing successful models in S&T will automatically access the development. Therefore, self-determination for development support the idea that countries, especially undeveloped ones, must stop imitating the models designed and implemented by industrialized countries and, instead, try to create their own development models by establishing goals that satisfy national needs and address national problems. In general, there is agreement that self-determination is related to the construction of a model of self-development that guarantees national autonomy in all areas (economic, political, social, etc.) and that is oriented towards the resolution of national problems, above all, from majority social groups. Likewise, a nodal point of autonomous development is to achieve scientific and technological self-determination with the aim of eliminating scientific-technological dependence since this contributes to accentuating the gap between developed and underdeveloped countries.

## **Evaluation of Cryptocurrency Markets in the Field of International Tax Law**

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This research examines the consideration of Cryptocurrency markets in terms of international tax law and discusses the taxation difficulties and solutions of the rapidly growing digital asset class. Additionally, the cross-border nature of Cryptocurrencies, the risks of tax evasion and money laundering, and how they can comply with customer authentication regulations are also explored. The first section of the research explains the definition of cryptocurrencies and how they work. Then, how cryptocurrencies should be classified in the context of international tax law and how this classification affects taxation consequences are discussed. While the reasons such as structurally not being connected to the central authority of cryptocurrencies and making it impossible to control these currencies by not being supervised by the state authority pose a risk for the buyers, on the other hand, there are also problems of not being able to benefit from some advantages such as legal and financial security provided by the state authority. Cryptocurrencies have been integrated into daily life by users and are used as high-profit investment instruments, but the legal groundwork for taxation continues internationally. Cryptocurrency is not accepted as a capital market instrument because it is traded through the exchange system for investment purposes, and its values change according to supply and demand. In addition, since a central authority does not issue them, and their supply is limited, Cryptocurrencies are not considered commodities and are not accepted as goods. For cryptocurrencies to be taxed both in Turkey and at the international level, cryptocurrencies must first be legally recognised and taken as a source of income and gain. They must be bound to reciprocity agreements between countries.

*Keywords: Cryptocurrencies, International Tax Law, Tax Regulations, Capital Markets*

## Credit Supply and Its Determinants in Ethiopian Banking Sector

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Credit supply plays a pivotal role in fostering financial growth and ensuring economic stability. This study aims to examine the dynamics of credit supply and its determinants within the Ethiopian banking sector. Through a quantitative research approach, data was collected from a selection of ten commercial banks spanning from 2010 to 2021. The study employed the two-step System GMM estimation method to scrutinize seven variables and their impact on the credit available from these banks, utilizing data extracted from audited financial statements of Ethiopian commercial banks and macroeconomic data from the National Bank of Ethiopia. Within this investigation, the independent variables studied encompassed the inflation rate, market share, lending interest rate, money supply, non-performing loans (NPL), COVID-19, and political instability, while the credit supply of commercial banks served as the dependent variable. Analysis of the regression results revealed that both the inflation rate and market share demonstrated a positive and statistically significant effect on credit supply. Conversely, the presence of COVID-19, lending interest rate, and the NPL exhibited a negative and statistically significant impact, while the money supply showcased a negative and statistically significant effect on credit supply. Drawing from these outcomes, the study recommends that Ethiopian commercial banks augment their market shares by enhancing deposit mobilization and consider a holistic approach to macroeconomic factors in their internal credit management strategy. Furthermore, it advocates for the extension of additional credit to sectors significantly affected by the coronavirus, taking into account creditworthiness as a critical factor.

*Key words: Credit Supply, Market share, COVID-19, Ethiopia*



## **Rural-Urban Divide in Question:**

### **A Methodological Analysis of Recent Statistical Classification in Turkey**

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Rural and urban divide has been discussed in terms of their distinguishing characteristics for a long time. The perceptions of what really differentiates rural and urban have changed temporally and geographically. In the recent “world of the polycrisis,” especially the rising living expenditures in cities and food-related shortages led to a seemingly reverse pattern in the traditional movement of people from rural to urban areas. Not only the urbaners exploring new ruralities and/or ecological lifestyles but also the ones who barely manage to survive in cities under inflationist conditions have begun to move to the newly imagined rural. Having this context in the background, this research investigates the recent developments in rural–urban divide as reflected in statistical methodologies. It first presents a comparative review of current global definitions of rural and urban in different statistical databases. Then, definitions adopted in Turkey during Republican history will be examined. Currently, a new classification of TURKSTAT is announced in May 2023 yet as the country has been lacking a working definition for the rural in the last ten years due to the elimination of the existing one by the Municipality Law No 6360 of 2012. This paper introduces the recent classification and discusses its possible implications. It shows demographic distribution among densely populated, intermediate-density and thinly populated areas. By doing so, the paper argues for both the still-kept economic and social importance of rural and the necessity of further investigation of peri-urban areas in Turkish case.

## Opening Armenia-Turkey Borders: Economic Opportunities, Expectations, Concerns

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After decades-long trade and cooperation through two cross-points, the borders between Armenia and Turkey were closed due to the First Nagorno-Karabakh War in 1993. In 2021, Armenia and Turkey is in another round of diplomatic attempts for normalization. One of the most crucial aspects of normalization is the possibility of opening of borders. Two border cross-points in question are located in Kars and Iğdır in Turkey. The first cross-point is the Doğu Kapı/Akhuryan railway crossing-point located at the Akyaka town in Kars, Turkey and Akhurik in Gyumri, Armenia. The second cross-point is Alican/Margara land crossing-point located at the Karakoyunlu town in Iğdır, Turkey and Armavir region of Armenia. In this article, I aim to discuss the previous economic engagement prior the closure of borders and elaborate the economic opportunities a possible opening brings. I complement this discussion with the economic expectations and concerns of local population. The article is based on existing economic research of non-governmental organizations and development agencies as well as fieldwork conducted in Kars and Iğdır between 2022 and 2023.

## Main difficulties in the regulation of nanomaterials

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This text identifies the main problems that hinder the regulation of nanomaterials, emphasizing key aspects mentioned in documents issued by the U.S. and the European Union; powers that guide the regulation of nanomaterials worldwide. The result indicates that they are materials in continuous evolution, they can be found as nanomaterials in themselves or as part of advanced materials and chemicals. Their great development is out of step with the ability of governments to regulate them. Basic elements of regulatory support such as their definition and the methods of analysis to characterize them are not yet fully developed. Determining the risk by conventional means is a complicated process because each nanomaterial behaves in a particular way, making it difficult to determine its toxicity and exposure pathways, in addition to the fact that these materials are susceptible to transformation throughout their life cycle. In general, the legislation on nanomaterials is complex in its very structure, because they are part of the R&D of several countries and of the productive base of several economic activities, so they are found both in everyday goods and in highly specialized products, which has caused them to enter and accumulate in ecosystems.

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## **From Financial Development to Informality: A Casual Link**

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Financial development reduces the cost of accessing external financing and thus incentivizes investment in higher-productivity projects that allow firms to expand to the scale needed to operate in the formal economy. It also encourages participants of the informal sector to join the formal sector to gain access to credit and financial services. This paper documents two findings. First, countries with more pervasive informality are associated with greater financial development. Second, the impact of financial development, and especially banking sector development, on informality is causal. This causal link is established in an instrumental variable approach, in which financial development is instrumented using a novel measure of cross-border financial integration. The causal link is stronger in countries with greater trade openness and capital account openness, where cross-border financial linkages are typically also stronger.

## **Exploring the Impact of Entrepreneurship on Personal Income Inequality: A Machine Learning Approach**

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This study particularly aims at investigating the effects of entrepreneurship on personal income inequality employing machine learning algorithms. Economic theory does not have a clear consensus on the link between entrepreneurship and income inequality. Therefore, this issue is important to investigate. Personal income inequality model has been trained by using both random forest and catboost algorithms and the contributions of model inputs in the prediction of personal income inequality have interpreted by making use of the Tree SHAP algorithms with swarmplots. The data employed in the empirical analysis is 2019 TURKSTAT Household Budget Survey in Türkiye with a sample size of 1275 household per head. The findings of the study shows that: (i) Entrepreneurship income is the key determinant affecting personal income inequality and positively related to personal income inequality; (ii) Personal income inequality is more likely for young and highly educated people; (iv) Household per head having high labor, transfer, real estate and interest income contribute to personal income inequality; Finally, to increase personal income equality, the results of the study suggest the implementation of the following policy measures: Instead of increasing government transfer expenditure, the entrepreneurship incentive programs can help to increase personal income equality. Incentives should be created to target middle-aged and highly educated individuals.

## The Modern Information War against Democracy

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Nowadays, modern information and technological advances have allowed states to gain unlimited access to information, enabling them to further strengthen their positions and independently manage the information space. The information war has limited military confrontations, although it softened sharp confrontations between the states. Confidentiality, freedom of speech and expression these are exactly those constitutional rights that most represent the contours of democracy. As for the freed, it is reflected in the constitutions of democracies. The threat of information war is associated with the shortcomings of many political systems. The result that can arise in conditions of information war, propaganda, spread of disinformation, can cause serious damage to any state. So, it is obvious that each stakeholder is responsible for participating in the fight against information warfare.

*Keywords: Information Warfare, Propaganda, Disinformation, Polarization; Military Intervention; Liberal Democracy.*

## **Impact of Fiscal Stimulus on Unemployment Rates: Insights from the COVID-19 Era in Western Balkan Countries**

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This paper conducts an empirical investigation into the implications of fiscal policy measures before, during, and after the COVID-19 pandemic, utilizing a distinctive dataset of economic indicators spanning from 2000 to 2022 for six Western Balkan countries. Employing an empirical econometrics model, this study aims to discern the effects of fiscal stimulus during the COVID-19 pandemic on the unemployment variable in the WB6 region. Methodologically, it employs diverse approaches, including Ordinary Least Squares (OLS), robust OLS, fixed and random effects models, and the Hausman-Taylor test with instrumental variables (Baltagi, 2013). The findings reveal a complex interplay of factors during the pandemic period. Consumption, government spending, and economic growth are identified as contributors to the surge in unemployment rates. Conversely, taxes are found to exert a beneficial impact on alleviating unemployment pressures. This research stands out for its unique perspective on the Effects of Fiscal Stimulus, offering valuable insights into the dynamics of unemployment in the Western Balkan region during the COVID-19 crisis.

**The Examination of the Inequality of Liberal Trade Relations  
Between Developed Countries, Less Developed Countries,  
and Developing Countries in the Context of Industry,  
Food, and Agricultural Products**

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According to the law of comparative advantages, it is expected that as a result of the mutual free trade between developed countries and less developed or developing countries, the purchasing power attained by countries is anticipated to be relatively higher than their previous purchasing power. Consequently, it should ultimately be expected that due to this higher purchasing power, these countries would have the ability to import more of the product in which they do not have a production advantage. The subject of this study is to examine the expected outcomes arising from the theory of comparative advantages and liberal trade in terms of industrial products as well as the agriculture and food products, from the perspective of developed and less developed countries. The study investigates the scenario resulting from the free trade of selected developed countries, less developed countries, and developing countries regarding industrial and agriculture-food products. In this context, an attempt has been made to determine what kind of results the implemented free trade among these countries has yielded in terms of the external trade of industrial products and agriculture-food products, and in which direction it has influenced the country's economy and consumer behaviors.



## **Demographic Changes, Economic Growth and Income Inequality: Pension Schemes and Macroeconomic Environment in Greece**

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In the light of the upcoming ageing and population decline combined with the already high state subsidy on pensions, the Greek government capitalized the auxiliary pension in order to stimulate the efficiency and long-term sustainability of the pay-as-you-go (PAYG) pension scheme. Taking this into account and following a “demand-based” theoretical approach, we compare the interaction of the determinants of a pay-as-you-go and a fully funded (FF) pension scheme with the macroeconomic environment aiming to investigate the impact of demographic changes on economic activity and income distribution. Therefore, unlike the majority of relevant studies, by considering the pension sector as an integral part of the macroeconomic environment, we examine which pension scheme is able to manage demographic changes more effectively, not only in terms of state budget, but also in terms of economic growth and income inequality. On this basis, we also highlight the critical role of functional income distribution and trade unions’ bargaining power in determining income inequality and in offsetting the effect of demographic changes on economic activity.

# PROCEEDINGS

## Behavioral Managerial Accounting: Cost Behavior, Cognitive Biases, Predictability and Control

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### ***Abstract***

*The advent of the behavioral aspect in accounting and finance highlights the recognition that investors and managers do not always act rationally. Decision-making processes are acknowledged to be influenced by a combination of rationality and emotions. In this behavioral perspective, individual biases can impact managers, hindering them from making decisions solely on a rational basis. The objective of this paper is to provide a literature review of the main studies performed in the field of behavioral managerial accounting; in particular, the relationship between the behavior of costs, the cognitive biases individuals utilize, the accuracy of cost prediction and control issues. The paper starts by giving a historical review of the origins of behavioral managerial accounting, the first studies conducted in this field, then it continues to review the main studies performed about the effect of cognitive biases on cost behavior, cost predictability and control issues. Although this paper itself is not an empirical research, it provides insights into the main research performed. It draws the attention of academicians to the most important considerations to think about when performing further studies in the future.*

*Keywords: Behavioral Managerial Accounting, Cost Behavior, Cognitive Biases, Predictability of Costs and Control*

### **1. Introduction**

In the classical "Contemporary" realm of accounting research, decision-making processes related to cost behavior and management are traditionally considered based on information from accounting reports, past performance analysis, and management forecasts. However, the emergence of the behavioral side in accounting and finance challenges the assumption of rationality among managers and investors. This perspective highlights that decisions are influenced by both rationality and emotions, introducing the concept of individual biases. Notably, the study of Argyris (1952) on the relationship between managerial attitudes and the budgeting process was pioneering in integrating human behaviors with accounting functions, marking a significant direction in research and literature by exploring the interplay of psychology and managerial accounting.

Devine (1960) asserted that the psychological traits of users of accounting and financial information serve as crucial indicators for understanding the significance of the behavioral aspect in both the theoretical and practical realms of accounting. Stedry (1960) continued this exploration by predicting the connection between accounting issues and psychology. He sought to elucidate the relationship between budget performance and psychological factors such as the difficulty of budget goals and individual motivations and incentives. Stedry (1960) applied the concept of the level of aspiration to budgets in his study to comprehend how these factors influence budget performance. According to Dyckman and Zeff (1984), the 1960s are considered a golden or

awakening decade in the field of accounting, with the influential study of Caplan (1966) emphasizing the need to analyze and understand behavioral assumptions for the advancement of both the theory and practice of management accounting.

In the 2000s, there was a notable acknowledgment of the importance of studies related to behavioral managerial accounting. Scholars such as Lukka and Mouritsen (2002), Hopwood (2002), Ittner and Larcker (2002), and Luft and Shields (2002) emphasized that research strategies in this field should integrate both economic and behavioral models to make substantial progress. They argued that relying on both economics and psychology yields more relevant findings compared to exclusively using economic models. Luft and Shields (2002) highlighted the contribution of various social science disciplines, including psychology and sociology, to research and studies in managerial accounting. These disciplines offer a better opportunity to address significant issues, such as the interaction between accounting information and individuals, and provide robust and comprehensive findings.

Psychology played a pivotal role in shaping the field of behavioral managerial accounting, particularly among various social sciences disciplines. Three essential components of psychology—social, motivation, and cognitive psychology—were identified as crucial for management accounting. Stedry (1960) utilized motivation psychology concepts in his study, investigating the influence of budget goals on individual performance. Hopwood (1972) applied social psychology concepts to explore how the actions of a superior individual (management) affect the performance of employees or team members. In the same year, Barefield (1972) examined the effectiveness of management decisions by aggregating different related cost variances, incorporating concepts from the cognitive (human thinking) side of psychology. Another noteworthy study by Mock et al. (1972) aimed to elucidate the relationship between employees' thinking styles, the feedback of accounting information, and their impact on decision-making.

## 2. Cognitive Biases and Cost Behavior

As per Riahi-Belkaoui (2002), the first stream concerning the concentration of accounting data examines the conditions that restrict a decision maker's ability to adjust decisions to changes in accounting policies and procedures. Ashton (1976) conducted a significant study in this regard, aiming to illustrate how the transition from full or absorption costing to variable costing influences individual decisions. In subsequent years, Bloom et al. (1984) compared decisions made by individuals and groups resulting from changes in depreciation methods. Luft and Shields (2001) investigated how individuals process information when intangible costs are capitalized instead of expensed. According to Dearman and Shields (2005), the issue of accounting data concentration, also known as "Accounting Fixation," reflects a link between knowledge, ability, and motivation, as changes in cost accounting methods impact pricing decisions.

Lipe (1993) asserts that the manner in which information is represented significantly influences decision quality, especially in the context of decisions related to the control and investigation of cost variances. The argument highlights the importance of considering the framing and formation of information in the decision-making process within the domain of cost accounting. Shields (1983) posits that the level of sophistication in employees' performance reports has a direct impact on their motivation to seek and employ various cognitive heuristics. Building on this, Sullivan (1988) argues that the presentation of information through tables, graphs, and figures plays a substantial role in influencing management decisions about costs. This argument is grounded in the idea that physically representing information has a tangible effect on the decision-making process, underscoring the importance of the visual and structural aspects of information in shaping managerial

choices related to costs. Dearman and Shields (2001) highlight the significant impact of employees' knowledge of cost accounting concepts on the performance of volume-based costing systems. They emphasize that cost accounting literacy plays a substantial role in shaping estimates and judgments regarding different cost categories, especially in the context of various forms of resource consumption. In a related vein, Cardinaels (2008) argues that a comprehensive understanding of decision-making processes based on costs requires a study of both the complexity of accounting information and the presentation methods of information. This underscores the need to consider not only the intricacy of accounting information but also the way it is presented to comprehend its effects on the decision-making process.

### **3. Methods Used in the Behavioral Managerial Accounting Field**

Several studies in the literature have raised concerns about the inclusion of professionals in laboratory experiments, suggesting that their behavior during experiments may deviate from real-life scenarios. This has prompted questions about the validity and credibility of laboratory experiments, as the involvement of cognitive biases could be a factor. Liyanarachchi (2007) proposes that business and accounting students might be more suitable participants for many behavioral accounting studies, emphasizing the importance of the realism and validity of experimental conditions over the results themselves. He underscores the need for careful design of decision-making experiments and emphasizes the importance of scrutinizing their theoretical foundations and findings to mitigate concerns regarding their validity.

Croson (2005) highlights several distinctions between experiments conducted in psychological studies and those in accounting and economic studies. Psychological experiments place significant emphasis on the study's context and may involve deceptive elements aimed at tricking participants, a practice criticized by accounting and economic studies as it poses a threat to experiment validity. In contrast, accounting and economic studies prioritize realism, justifying the incorporation of financial and monetary variables in their experiments. Financial incentives are commonly used, aligning with economic decision-making theories that involve compensation. This stands in contrast to psychosocial studies where such monetary and financial variables are typically not employed.

While laboratory experiments remain dominant in behavioral management accounting studies, alternative methods such as market experiments and field experiments are also utilized. Market experiments entail the creation of artificial markets with multiple buyers and sellers over several time periods. An exemplar study using market experiments is Sprinkle's (2000), which compares incentive-based and flat-wage compensation systems, exploring their impact on employee performance and learning. However, market experiments face criticism for their high cost and lack of realism. In contrast, field experiments maintain conditions akin to laboratory experiments but are conducted in real-world settings such as actual markets or firms. While this enhances realism, it also diminishes the researcher's control over the study's design and variables.

Surveys rank as the second most commonly used research method in the field of behavioral managerial accounting. These surveys draw on insights from other social disciplines like psychology and sociology, leveraging concepts such as satisfaction, attitude, motivation, optimism, and pessimism to study and measure behaviors and attitudes. Shields and Shields (1998) argue that surveys outperform laboratory experiments in studies related to the participative budgeting process, based on an analysis of 47 published studies in this area. Hageman (2008) supports this, noting that surveys are more economically feasible and allow for the collection of a larger volume of data while maintaining a greater degree of validity and realism. Despite these advantages, surveys are subject to criticism for potential biases, including social desirability and non-response biases.

In research exploring the relationship between an individual's cognitive biases and cost behavior, laboratory experiments emerge as the dominant methodology. A notable study in this domain is the work of Dalla Via (2014), which aimed to investigate the impact of individuals' cognitive traits and the format of financial information on cost behavior and predictions. The study suggests that judgments about cost behaviors and predictions are more accurate when a symmetric pattern of costs, rather than a sticky one, exists. A sticky cost pattern refers to costs increasing at a higher rate with increasing sales or activity and decreasing at a lower rate with decreasing sales. Additionally, the study proposes that presenting financial information in percentages rather than absolute values enhances the accuracy of cost behavior predictions. Finally, under a sticky cost pattern, the study suggests that data presented in monetary values are considered less beneficial than data presented in percentages.

#### 4. Literature Review

The rapid development in technology accompanied by the emergence of high-tech information systems (i.e. ERP systems); increased the opportunity for managers and professionals to have timely, more detailed and precise financial reports about cost management. One of the main problems faced by managers regarding cost behavior is the relationship between changes in sales volume, and the corresponding change in cost and resources levels. A notable study that investigates this issue is the study of Anderson et al. (2003), which sheds light on the asymmetry in cost behavior in relevance to changes in activity volume. The article categorizes costs that increase or decrease with certain changes in activity volume under the name of sticky costs. It also establishes a cost behavior model that relates changes in cost behavior to the adjustments and actions made by managers. Later in the same year, Ittner et al. (2003) indicated that managers and professionals rely on subjectivity and their experiences when they need to make decisions quick and cheap decisions; as a result, it is concluded that managers do not always utilize mathematical and statistical models when they need to make decisions about costs.

Numerous studies, including those by Tversky and Kahneman (1981), Lipe and Salterio (2002), and Cardinaels and Van Veen-Dirks (2010), assert that managers' reliance on subjectivity can lead to accuracy issues in predicting cost behavior. These studies also indicate that the way financial information is formulated and presented can influence managers' mental modeling. The assumption is that presenting the same information differently may lead to different decisions. The psychological and cognitive biases of managers play a role in how they process information, impacting their decisions in the realm of cost management.

According to Banker et al. (2000) and Ittner et al. (2003), managers, when making decisions about costs based on accounting data, need to establish certain assumptions related to the available data to facilitate timely decision-making. This process entails applying the managers' subjectivity to take prompt action. However, the use of subjective analysis can impact the accuracy of managerial judgment and decision-making. The argument is that individuals possess diverse mental capacities and employ various mental representation methods, leading to differing outcomes and decisions among managers.

Parker and Leinhardt (1995) emphasize that managers not only need to apply their subjectivity in managing cost behavior but also must deduce relationships between accounting data used in decision-making. Managers should comprehend the relationships between absolute values and be capable of converting them into percentages and ratios. This proficiency is essential for determining percentage changes in values and applying these changes in the decision-making process. Guiler (1946), Chatterjee et al. (2000), and Chen and Rao

(2007) argue that managers may encounter challenges related to processing percentages and ratios while performing simple computational tasks, potentially impacting the relationships derived from accounting data.

Research on the relationship between changes in costs accompanying variations in activity or sales levels, commonly known as "cost stickiness," originated with the study of Anderson et al. (2003). However, this study faced criticism for its limited scope from researchers like Anderson and Lanen (2007) and Balakrishnan et al. (2014). Critics argued that Anderson et al. (2003) focused solely on factors influencing cost stickiness at the firm level, neglecting individual behavior and cognitive biases. Banker and Chen (2006) later defended Anderson's study while expanding its scope to encompass both firm and economic factors. The inclusion of individual behavior and cognitive biases in the literature emerged with the study of Banker et al. (2011). This research considers managers' psychological traits, such as optimism bias or pessimism bias, linking them to financial data to gauge managerial attitudes. Specifically, the study utilizes past sales levels, interpreting a decline in current sales compared to previous periods as an indicator of pessimism.

## **5. Conclusion**

Earlier studies on cost behavior, encompassing the phenomenon of cost stickiness, typically overlooked the role of individuals as a significant factor in their analyses. However, it is crucial to acknowledge the impact of individuals' cognitive biases on cost behavior and the prediction of cost patterns. The tendency of managers to depend on subjectivity in their decisions related to cost management highlights the importance of understanding cognitive biases and their influence on the accuracy of managerial decisions.

Research on cost behavior has affirmed that the way financial information is presented and the diverse cognitive capacities of individuals significantly impact the accuracy of decision-making. Furthermore, the ability to predict the patterns in which costs move, known as their trend, is linked to the degree of stickiness or asymmetry in costs. A notable behavioral observation from studies in this field highlights individuals' inclination to adopt a sticky mental model, particularly when cost data is presented in monetary values. This is evident in the tendency of individuals to amplify the increasing behavior of costs more than the equivalent decreasing behavior.

Studies exploring the connections between individuals and cost behaviors should give greater attention to the cognitive mental modeling carried out by individuals. Understanding the process of mental modeling in response to presented information and its impact on financial decisions is crucial. As individuals increasingly rely on subjectivity, the reliability of their decisions and the financial reports they produce becomes more uncertain. Effectively addressing this issue requires a thorough understanding of the cognitive biases employed by individuals.

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## **| ABSTRACTS & PROCEEDINGS |**

14. International Conference on Political Economy

### **Inflation, Employment, and Inequality**

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## Is The Fisher or Neo-Fisher Effect Valid in Asian Countries? A Panel Data Analysis on The Causality Between Inflation and Interest Rates

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### **Abstract**

*Nowadays, most of the central banks apply inflation targeting policy, so one of the most debated issues in the economy is the relationship between inflation and interest rate. This study aims to examine the Fisher hypothesis, which suggests that nominal interest rates move with inflation in the long run, and the Neo-Fisher hypothesis, which suggests that nominal interest rates have a determinant effect on inflation rates in the long run, in 30 Asian countries. Annual inflation and interest rate data for the period 2002-2022 are obtained from the World Bank and International Monetary Fund databases. Using the cross-sectional dependence test and the Emirmahmutoğlu-Köse and Dimutrescu & Hurlin panel causality test, on the one hand, the results of the cross-sectional dependence tests are used to estimate the existence of interdependence between cross-sections, and on the other hand, the results of the panel causality tests are used to investigate the Fisher and Neo-Fisher effects country by country. The causality analyses show that the number of countries with an effect of interest rates on the inflation rate is higher than the number of countries with an effect of inflation on interest rates. In other words, it is concluded that the Neo-Fisher effect is more valid in this analysis of 30 Asian countries.*

*Keywords: Fisher hypothesis, Neo-Fisher hypothesis, Inflation, Interest, Panel Causality Test, Asian countries*

*JEL Codes: E31, E43, E52*

### **1. Introduction**

The monetary policy of central banks in the form of targeting inflation by changing the policy rate is often criticized, as some doubt that the policy rate has little or no effect on inflation. However, during the Covid-19 pandemic and in the post-pandemic period, when most of the major central banks actively changed the discount rate in order to influence inflation, this topic again became one of the most discussed. Another reason for the growing interest in the Fisher effect, that is, the impact of the discount rate on inflation, was the unusual policy of Turkey. While most central banks with inflation targeting monetary policies actively raised interest rates in order to reduce inflation, Turkey, on the contrary, lowered rates for the same purpose. Thus, economists again asked themselves whether the effect is present in their country: the Fisher effect or the neo-Fisher effect, which assumes the influence of inflation on the discount rate.

This study aims to determine the direction of the relationship between inflation and policy rates in 30 Asian countries. This research uses annual inflation and interest rate data for selected Asian countries over 21 years, from 2001 to 2022, to test the Fisher and neo-Fisher theories.

In the first part of the research, a theoretical framework is presented, where the definitions of the main concepts are defined and the relationship between them is described in detail. Next, a literature review of existing articles on the Fisher effect is proposed, and the relevance of the topic of this article is also discussed. And then, information is provided on the data used for the analysis, the analysis methodology and its results. The article ends with a conclusion and suggestions.

## 2. Theoretical Framework

Irving Fisher (1930) developed an economic theory, according to which, interest rates and inflation are strongly related. The Fisher effect establishes a description of the real interest rate  $i'$  in an economy by considering both the nominal rate  $i$  and the inflation rate  $\pi$  by the following equation (Teall, 2023):

$$(1+i) = (1+i')(1+E(\pi)) \quad (1)$$

where  $E(\pi)$  is expected inflation.

According to the Fisher Effect, in the long run, nominal interest rates adjust one-for-one with expected inflation to maintain a constant real interest rate. If expected inflation increases, nominal interest rates should rise by an equivalent amount, and vice versa (Cooray, 2003). The Fisher Effect assumes rational expectations, where individuals accurately anticipate future inflation and adjust interest rate demands accordingly. In the Neo-Fisher effect, also called the Fisher paradox, in the long run, low nominal interest rates reduce inflation expectations while also reducing current inflation (Sugozu&Yasar, 2020). This term was suggested by Bullard (2010).

Proponents of the Neo-Fisher Effect contend that higher nominal interest rates could act as an anchor for expectations, leading people to believe that inflation will decline in the future. Current inflation may therefore decline as a result of this expectation. In the result of vast analysis, Cochrane (2016) concludes that economists and monetary authorities may overlook the existence of a positive impact of inflation to the interest rate movements (Ioana, 2017).

The Fisher and Neo-Fisher effects' applicability may fluctuate depending on the geography and economic climate. An array of factors, including exchange rate regimes, fiscal policies, institutional frameworks, and economic openness, might impact the observed correlation between interest rates and inflation. In order to overcome potential homogeneity and other econometric difficulties, testing the Fisher and Neo-Fisher effects experimentally involves the use of suitable econometric methodologies and robust data processing procedures.

One of the strong methods for examining these effects across a number of Asian countries is panel data analysis, which takes into account both regional trends and the unique peculiarities of each state. The investigation seeks to understand the dynamics between inflation and interest rates in Asian nations by establishing a theoretical foundation for the study. This will allow researchers to determine whether the observed relationships are more consistent with the traditional Fisher Effect or the paradoxical predictions of the Neo-Fisher Effect.

### **3. Literature Review**

An article by Frederick S. Mishkin (1992) titled "Is the Fisher Effect Real?": A reexamination of the relationship between inflation and interest rates," we deal with the Fisher effect and reassess the relationship between inflation and interest rates. The Fisher effect is an economic theory that assumes a direct relationship between inflation and nominal interest rates, suggesting that higher interest rates lead to higher inflation. Myshkin critically analyzes this relationship, questions its validity, and seeks alternative explanations for the observed empirical evidence. Through a thorough examination of existing literature, empirical studies, and economic models, Myshkin challenges conventional assumptions and provides new insights into the complex dynamics between inflation and interest rates.

The Fisher hypothesis was examined in various studies for different countries and country groups. Sugözü and Yaşar (2020) examined the relationship between inflation and interest rates in OECD countries. Using panel regression, CADF test and causality analysis techniques, the authors discovered, that there both effects, Fisher and neo-Fisher, are valid in the chosen group of countries.

Telek (2020) examined the Fisher effect for D-8 countries (Türkiye, Egypt, Iran, Malaysia, Pakistan, Indonesia, Bangladesh, Nigeria) using CADF-CIPS unit root test, Westerlund and Edgerton (2007) LM Bootstrap cointegration test and CCE test. As the result, they concluded that the effect was not valid for Nigeria and Malaysia, weak effect in Iran, and full-Fisher effect in other countries.

A study by Ucak et al. (2014) titled 'An Examination of Fisher Effect for Selected New EU Member States' examines the Fisher effect in the context of new European Union (EU) Member States. In the result of empirical analysis developed by Hatemi-J and Hacker (2005), the authors found presence of a tax adjusted Fisher effect in the presence of a structural break.

The research conducted by Özbek and Taş (2023) titled "Panel Econometric Analysis of Fisher and Neo-Fisher Effects of Inflation and Interest Relationship" delves into a comprehensive examination of the interplay between inflation and interest rates using panel econometric methods. The authors concluded a validity of Fisher effect in selected developed and emerging economies via applying Westerlund (2006), Westerlund and Edgerton (2008) panel cointegration tests in the empirical analysis using the 2002:Q1-2019:Q2 sample period data.

Türkiye is one of the mostly studied countries for Fisher effect in recent years. Most of them suggest either strong relationship between inflation and interest rate or validity of Fisher hypothesis. So, Kanca et al (2015) confirms the validity of the effect in Türkiye. Atgur and Altay (2015) as well detected strong relationship between the interest rate and inflation in the long run.

Most of the literature is written only on certain groups of countries, such as developing, developed and underdeveloped, or on individual countries in particular. What makes our analysis unique is that the 30 Asian countries included in our analysis include almost countries of varying degrees of development and income levels.

## 4. Dataset, Methodology and Test Results

### 4.1. Dataset

The dataset for analysis consists of annual data of inflation and interest rates for 21 years, from 2001 to 2022. The inflation data was obtained from databank of the World Bank, and the nominal interest rates data was taken from the database of International Monetary Fund.

This study considers 30 Asian countries, which were selected by the data availability in open sources for the chosen period of time. The list of the states is as follows: Armenia, Azerbaijan, Bangladesh, Belarus, Bhutan, Brunei Darussalam, Cambodia, China, India, Indonesia, Iraq, Israel, Japan, Jordan, Kazakhstan, South Korea, Kuwait, Kyrgyzstan, Malaysia, Mongolia, Oman, Pakistan, Philippines, Qatar, Russia, Saudi Arabia, Singapore, Thailand, Turkiye, and Vietnam.

*Table 1: Variables*

Variables	Description	Measurements	Source
INF	Inflation	Annual, %	World Bank
INTR	Interest rate	Annual, %	International Monetary Fund

### 4.2. Methodology

In the study, first the cross-sectional dependency test of the variables was applied. After that, the Pesaran and Yamagata (2008) homogeneity test was applied. Finally, both Dumitrescu and Hurlin and Emirmahmutoğlu and Köse panel causality analyses were conducted in order to determine the causality relationship between the variables.

In order to obtain more accurate results in studies using panel data analysis, cross-sectional dependence must first be tested. With cross-section dependence, it can be determined whether the economic shock experienced in one country also affects other countries. If cross-sectional dependence is not taken into account, an analysis is made with misleading and even inconsistent parameters. For this reason, it is extremely important to examine the cross-sectional dependence test separately for both the variables and the model.

The most recommended cross-section dependence test for this purpose is CD testing, which was created by Pesaran (2005) and may be utilized under  $T > N$  and  $T < N$  situations. It is stated as follows (Pesaran et al, 2008):

$$CD_{LM3} = \sqrt{\frac{2T}{N(N-1)}} \left( \sum_{i=1}^{N-1} \sum_{j=i+1}^N \hat{\rho}_{ij} \right) \quad (2)$$

The hypotheses of the test in question are as follows:

$H_0$ = There is no cross-section dependence.

$H_1$ = There is cross-section dependence.

To test for slope heterogeneity of the panel data, Pesaran & Yamagata (2008) model was implied. Our panel-data model with heterogeneous slopes can be written as follows:

$$Y_{i,t} = \mu_i + \beta' X_{i,t} + \varepsilon_{i,t} \quad (3)$$

where  $i = 1, \dots, N$  represents the cross-sectional dimension and  $t = 1, \dots, T$  the time dimension.  $\mu_i$  is a constant.  $\beta$  is a  $k \times 1$  vector of unknown slope coefficient with  $k = k_1 + k_2$  being the total number of regressors. The null hypothesis is formulated as

$$H_0: \beta_i = \beta \text{ for all } i,$$

against the alternative:

$$H_1: \beta_i \neq \beta \text{ for some } i$$

In  $H_0$ , slope coefficients are homogenous, whereas the alternative hypothesis ( $H_1$ ) is that the slope coefficients are heterogeneous.

Emirmahmutoğlu & Köse (2011) and Dumitrescu & Hurlin (2012) tests were conducted from panel causality analyses to measure the validity of theories about the relationship between energy consumption and economic growth. These two analyses are among causality analyses that take into account cross-section dependence and can provide results for each country within the scope of the model as well as general results of the model.

Fisher (1932) established the Meta-Analysis approach to examine the causation link between variables in a time series. The Emirmahmutoğlu & Köse test is the form of the Toda-Yamamoto test turned into heterogeneous panel data. A meta-analysis is a test that combines the findings of several studies testing the same hypothesis in an attempt to provide a single, common outcome. One benefit of the Toda-Yamamoto test is that it can be used without the need for preliminary tests, which are necessary to find the unit roots and cointegration of series and are performed before to the Granger causality test. The Emirmahmutoğlu & Köse causality test does not require preparatory tests because it is an extended version of the relevant test (2011).

The VAR model, which considers cross-sectional dependence, was created by Emirmahmutoğlu & Köse (2011) and evaluated for each cross-section of the causality test (2011):

$$x_{i,t} = \mu_i^x + \sum_{j=1}^{k_i+dmax_i} A_{11,ij} x_{i,t-j} + \sum_{j=1}^{k_i+dmax_i} A_{12,ij} y_{i,t-j} + u_{i,t}^x \quad (4)$$

$$y_{i,t} = \mu_i^y + \sum_{j=1}^{k_i+dmax_i} A_{21,ij} x_{i,t-j} + \sum_{j=1}^{k_i+dmax_i} A_{22,ij} y_{i,t-j} + u_{i,t}^y \quad (5)$$

For each  $i$  in the model;

$k_i$  = Lag length

$dmax_i$  = maximum integration of variables in the system.

The hypotheses of the test are as follows (Emirmahmutoglu & Kose, 2011):

$$H_0: R_1 \alpha_i = 0 \quad \text{for all } i's$$

$$H_1: R_1 \alpha_i \neq 0 \quad i=1, \dots, N_1; \quad R_1 \alpha_i = 0 \quad i=N_1+1, \dots, N \quad (6)$$

Dumitrescu & Hurlin's (2012) causality analysis also considers the cross-section dependence of the panel. When N is the cross-section size, T is a test that can be used in both T-N and N.T scenarios. This test is recommended in part because it can be used in each of these scenarios. But before anything else, the pertinent test converges to the regular standard normal distribution. Furthermore, for a fixed T instance, a semi asymptotic distribution has been found. Below is the heterogeneous model that was developed for each unit at time T (Dumitrescu & Hurlin, 2012):

$$y_{i,t} = \alpha_i + \sum_{k=1}^K \gamma_i^{(k)} y_{i,t-k} + \sum_{k=1}^K \beta_i^{(k)} x_{i,t-k} + \varepsilon_{i,t} \quad (7)$$

Below are the test hypotheses, which suggest that the alternative hypothesis (Dumitrescu & Hurlin, 2012) shows a causal relationship between these variables and that the Granger causality relationship is not present in the zero hypothesis:

$$H_0: \beta_1 = 0 \quad \forall_i = 1 \dots N$$

$$H_1: \beta_1 = 0 \quad \forall_i = 1 \dots N_1$$

$$\beta_1 \neq 0 \quad \forall_i = N_1 + 1, N_1 + 2, \dots, N \quad (9)$$

#### 4.3. Test Results

In panel data unobserved factors may create interdependencies within cross sections, therefore cross-sectional dependence tests, Breusch-Pagan LM, Pesaran scaled LM, Pesaran CD, and Bias-corrected scale LM, are applied. Null hypothesis is no cross-section dependence (correlation).

*Table 2: Cross-Sectional Dependence Tests Results*

Test	INF	INTR	Residuals
Breusch-Pagan LM	1 910.62 (0.00)	1417.02 (0.00)	1689.40 (0.00)
Pesaran scaled LM	49.01 (0.00)	32.28 (0.00)	41.51 (0.00)
Bias-corrected scaled LM	48.26 (0.00)	31.53 (0.00)	40.76 (0.00)
Pesaran CD	34.92 (0.00)	21.65 (0.00)	30.26 (0.00)



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As Breusch-Pagan test is applied for datasets, where  $N < T$ , and in our dataset's  $T$  smaller than  $N$ , its results can be ignored. In all other tests for INF, INTR and residuals, the probability is 0, thus, the null is rejected at 1%. Therefore, overall, there is interdependence within cross sections in the dataset.

After detecting the existence of cross-sectional dependence among the variables used in the model, second generation panel unit root tests were applied, taking cross-sectional dependence into account. In this study, CADF (Cross-sectionally Augmented Dickey-Fuller) unit root test developed by Pesaran (2006) was used. The CADF statistic is valid when  $N > T$ , but also when  $T > N$ . The CADF test statistics are as follows:

*Table 3: CADF Test Results*

Variable	Level	
	Delay	CIPS stats
INTR	1	-2.486*
INF	1	-2.847*
Critical values of the means of the extended Dickey-Fuller distribution with individual cross-sections (model with constants) N:30, T:21	1%	-2.32
	5%	-2.15
	10%	-2.07

\* symbol indicates that the statistical value is significant at %1 and the variable is fixed.

When the CADF unit root test results in Table 5 are examined, it is seen that each of the variables is stationary at level.

*Table 4: Slope homogeneity test results.*

	Delta	p-value
	5.469	0.000
adj.	5.907	0.000

According to the results, the p-values are 0, thus, we reject the null hypothesis and accept the alternative. Therefore, we conclude that, there is a heterogeneity within the slope.

Emirmahmutoglu & Kose (2011) panel causality test considers null hypotheses for two models, where one of them is absence of neo-Fisher effect, and the other is absence of Fisher effect.

The results reveal rejection of the null, that the interest rate does not affect inflation, thus validity of neo-Fisher effect in China, Iraq and Russia at 1% confidence level, in Indonesia, Kazakhstan, Mongolia and Singapore at 5% confidence level, and in Jordan and Philippines at 10% confidence level.

Fisher effect is valid in Iraq at 1% confidence level, and in Oman at 10 % confidence level, as we reject the null of absence of the effect.

Table 5: Panel Causality Test by countries

Countries	INTR does not cause INF				INF does not cause INTR			
	Emirmahmutoglu & Köse		Dumitrescu & Hurlin		Emirmahmutoglu & Köse		Dumitrescu & Hurlin	
	Wald	p-val	Wald	p-val	Wald	p-val	Wald	p-val
Armenia	0.028	0.868	0.003	0.954	0.310	0.577	0.472	0.492
Azerbaijan	1.342	0.247	0.372	0.542	0.504	0.478	0.741	0.389
Bangladesh	0.097	0.756	0.020	0.888	0.604	0.437	4.264	0.039**
Belarus	1.588	0.208	1.224	0.269	0.106	0.745	0.057	0.811
Bhutan	0.617	0.432	2.377	0.123	0.306	0.580	0.000	0.994
Brunei D.	1.121	0.290	0.186	0.667	0.251	0.616	1.604	0.205
Cambodia	2.116	0.146	0.546	0.460	0.087	0.769	0.355	0.551
China	24.705	0.000***	7.634	0.006***	1.790	0.181	1.412	0.235
India	0.070	0.791	0.016	0.899	0.334	0.563	3.545	0.06*
Indonesia	5.261	0.022**	5.143	0.023**	0.232	0.630	0.019	0.890
Iraq	7.461	0.006***	0.425	0.514	9.127	0.003***	15.764	0.000*
Israel	0.159	0.690	0.320	0.572	0.000	0.991	0.289	0.591
Japan	0.831	0.362	0.005	0.943	0.036	0.850	0.002	0.967
Jordan	3.375	0.066*	2.957	0.085*	0.399	0.528	0.024	0.878
Kazakhstan	6.111	0.013**	5.963	0.015**	0.527	0.468	0.778	0.378
Korea, Rep.	1.139	0.286	0.140	0.708	2.606	0.106	1.606	0.205
Kuwait	0.608	0.435	6.579	0.010**	0.081	0.776	2.121	0.145
Kyrgyz Rep.	0.539	0.463	2.223	0.136	0.561	0.454	0.224	0.636
Malaysia	0.013	0.910	0.788	0.375	0.553	0.457	0.537	0.464
Mongolia	6.114	0.013**	7.524	0.006***	0.004	0.947	0.233	0.630
Oman	0.002	0.968	0.859	0.354	2.768	0.096*	0.169	0.681
Pakistan	0.945	0.331	1.043	0.307	0.389	0.533	0.295	0.587
Philippines	3.440	0.06*	0.044	0.834	0.186	0.666	0.005	0.946
Qatar	0.499	0.480	1.634	0.201	0.261	0.609	3.487	0.06*
Russian Fed.	7.453	0.006***	6.596	0.010***	0.353	0.553	1.262	0.261
Saudi Arabia	0.146	0.703	1.723	0.189	0.263	0.608	2.665	0.103
Singapore	4.356	0.037**	0.686	0.408	0.327	0.567	0.350	0.554
Thailand	0.001	0.973	0.005	0.946	0.081	0.776	0.456	0.500
Turkiye	1.083	0.298	2.324	0.127	0.050	0.822	0.033	0.856
Vietnam	0.017	0.896	0.000	0.991	0.023	0.881	0.008	0.931

Note: 1 lag, \*\*\* 1% confidence level, \*\* 5% confidence level, \* 10% confidence level

Dumitrescu & Hurlin (2012) Panel Causality test results are similar to Emirmahmutoglu & Köse (2011) test results, however, Dumitrescu & Hurlin (2012) test revealed neo-Fisher effect in Kuwait as well. As to the Fisher effect, Dumitrescu & Hurlin (2012) test results indicates its validity in Bangladesh at 5% confidence level and at 10% confidence level – in India and Qatar.

## 5. Conclusion

According to the test results obtained in our analysis for Asian countries, we find that the Neo-Fisher effect is valid in more countries than the Fisher effect, although a rather insignificant relationship is observed. The results are also consistent with the panel results confirming only the Neo-Fisher effect. Accordingly, the causality relationship from nominal interest rates to inflation is more dominant. Nevertheless, it would not be a correct approach to view this relationship as unidirectional. Considering that the Fisher Effect is found in some countries in our study, albeit rarely, and that most of the studies in the literature conclude that the Fisher Effect is valid, it would be a wrong approach to argue that there is only a one-way relationship. As a result,

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these two variables act together with each other. In a country, it would be a better approach to produce policies aimed at eliminating the causes of both variables rather than investigating which variable is the trigger and producing policies accordingly.

Inflation rate is not a variable that can be directly intervened, but interest rates are open to intervention. Therefore, while eliminating the causes of inflation on the one hand, interest rates can be intervened on the other. However, if this is done without taking other variables into account, it may have negative effects on the economy. For example, according to the result of the analysis, it will be necessary to reduce interest rates in order to reduce inflation. However, while it is necessary to raise interest rates for financing domestic and external deficits, such an intervention may cause the economy to enter a foreign exchange bottleneck and trigger a crisis. In this case, economic decision makers need to decide which objective is more important or short or long term in the economic policies to be implemented and implement these policies in the appropriate order accordingly.

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## Misery Index and Inequality: An Empirical Reassessment

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*A full evaluation of economic performance must include measures of distributive justice (Asher, Defina, Thanawala, 1993)*

### **Abstract**

*The Misery Index (MI), which was invented by Arthur Okun, measures the economic health of an economy. This index helps to get a general idea about the economic situation of an average citizen in a country by combining the inflation rate with the unemployment rate. This study aims to investigate whether there is a relationship between MI, which reflects the general course of economic life, and income inequality, which is another indicator of economic discomfort. In this context, this paper tests the long-run relationship between the MI and income inequality in Türkiye over the 1988 – 2021 period, by using an augmented autoregressive distributed lag (ARDL) testing approach. The analysis results support that there is a long-term relationship between MI and income inequality in Türkiye (1988 – 2021).*

*Key Words: Inflation, Unemployment, Misery Index, Income Inequality*

### **1. Introduction**

“Inflation” and “unemployment” are economically undesirable conditions that should be kept at reasonable levels. The MI measures the overall economic health of an economy by combining these undesirable economic conditions. This index is probably the first attempt (Cohen, Ferretti, & McIntosh, 2014) to develop an index to measure the level of economic distress of the population.

The value of the index is simply the sum of the rate of unemployment and inflation. The MI was invented by Okun in the early 1970s when the United States began experiencing “stagflation” which is a combination of both increasing unemployment and increasing inflation (Nessen, 2008). An increase in the MI represents that the economic conditions of people are getting worse and also worsening future prospects (Özcan & Açıkalin, 2015). And so, this index is both an indicator of economic well-being and unstable economic situations.

As stated before, the MI measures economic performance across two broad macroeconomic indicators. There is no doubt that these macroeconomic issues reflect important criteria in judging the performance of an economy. But at the same time, a holistic assessment of economic performance should also include measures of distributive justice. Okun himself believed strongly that the political process should give “reasonable weights” to equality (Asher, Defina & Thanawala, 1993). Based on this information, our study will focus on the relationship between the MI (reflects the economic discomfort) and income inequality which is another indicator of economic discomfort.

The health of an economy may be related to various socioeconomic factors. Thus, the MI has been the subject of study in many different countries from many different perspectives. Also, the economic misery and

indicators related to it differ among studies. The literature on the MI has focused on different channels of the economy, such as economic growth, monetary policy, or income inequality. For example, Bayar and Aytemiz (2019); Ghaffary Fard, Maleki Nasr, Saberi, and Ismail (2022); Nwani and Osuji (2020); Sadeghi, Marvasti, and Karbor (2014); Sotoudeh Nia Korrani and Ziya (2022); Tunali and Akdag (2023) have investigated the relation between economic misery and income inequality. Employed econometric methodology changes among these studies as the scope of the study differs.

In the study of Bayar and Aytemiz (2019), the relationship between the MI, corruption, and income inequality has been investigated for Latin American countries for the period 2022-2014. As empirical methodology panel cointegration and panel causality tests were employed. Results of the research suggest that there is a positive relation between the MI and income inequality. Also, it has been found that the causality between these indicators is unidirectional, from the MI to income inequality. One other study that investigates the effects of the MI on the income inequality indicator Gini coefficient is Ghaffary Fard et al. (2022). In the study, 12 Islamic countries' data for the period 2010-2018 has been evaluated. As empirical methodology fully modified ordinary least squares (FMOLS) technique employed. Results of the study revealed that there was a positive impact of the MI on the income inequality indicator Gini coefficient by 0.057.

In the context of investigating the relationship between economic discontent and income inequality, Beşkaya (2013), analyses the impacts of economic and political factors on economic discomfort by using the Turkish annual data from 1980 to 2010. Beşkaya (2013) finds that, in the short run, economic discomfort increases as income inequality and trade openness increase. The other study is Tunali and Akdag (2023). The study investigates the impact of economic discontent on income distribution for 4 fragile economies, Türkiye, Brazil, Argentina, and Indonesia by using data from 1985 to 2019. Researchers have preferred to employ the panel co-integration test as an empirical methodology. According to the result of the study, there has been no statistically significant relation between economic discontent indicator and income distribution. Another study in the context of economic misery that focuses on the impact of economic misery on poverty is the research of Nwani and Osuji (2020). In that paper, authors investigated the impacts of some socioeconomic indicators including the MI on poverty for 20 Sub-Saharan countries by using data for the period 1990-2018. For the analyzing method, robust least square and panel least square techniques were employed. The findings of the study suggest that there is a positive relationship between the MI and poverty so high MI values cause an increase in poverty.

The studies mentioned above, evaluate the relationship between the MI and income inequality for different groups of countries. On the other hand, some studies investigate the relation for a specific country. To give an example, studies of Sadeghi et al. (2014), and Sotoudeh Nia Korrani and Ziya (2022) both investigate the relationship between economic misery and income inequality in Iran. Firstly, the study of Sotoudeh Nia Korrani and Ziya (2022) the effect of the MI on income inequality has been evaluated for Iran by using data from 1971 to 2019. As the analysis method, the autoregressive distributed lags model is employed. Results of the study are in line with the literature which suggests that an increase in the value of the MI causes an increase in the income inequality indicator. As a last study that investigates the relationship between the MI and income inequality, the study of Sadeghi et al. (2014) can be evaluated. In the research data from 1972 to 2011 has been analyzed and an econometric model smooth transition autoregressive (STAR) model has been used. Results of the study suggest that above the threshold value of the MI, there is a positive relation between it and income inequality. However, there has not been found any significant relationship among the variables where the MI is below the threshold value.

Another aspect of the health of economic studies consists of the evaluation of economic growth and the MI. In this context we can refer to studies of Akay and Oskonbaeva (2020), Dadgar and Nazari (2018) and Wang, Haroon Shah, Ali, Abbas, and Ullah (2019). In these studies, the relation between economic growth and the MI. Firstly, the study of Akay and Oskonbaeva (2020) data from 16 transition economies for the period 1996-2017 was examined by using the panel ARDL technique to investigate the interaction between economic growth and the MI. Results of the study suggest that there is a long-run relation between variables, with the MI has a negative effect on economic growth. In the frame of the relationship between economic growth and economic misery, above mentioned study employs panel data analysis. Some studies investigate the same relation for specific countries. The first example is Dadgar and Nazari (2018)'s study in which the impact of economic growth on the MI of Iran was investigated by employing the vector autoregressive (VAR) model, Granger causality, and Johansen cointegration tests. The findings of this study are in line with the literature so there is a negative relation between economic growth and the MI. Another study in this frame is Wang et al. (2019)'s study in which the relation between above mentioned variables is examined for Pakistan. To do so, data from the period 1989-2017 was evaluated by using the ARDL model. The findings of the study suggest that there is a long-run relationship between economic growth and the MI. Also, the relation among variables has been found negative.

Another study in which the misery index is associated with different macroeconomic indicators is the study of Akçay (2018). In this study, the relationship between remittances and the MI has been investigated for Türkiye by using data for the period 1975-2011. As an analysis methodology ARDL model has been employed. Results of the study indicate that there was a cointegration between remittances and the MI values for Türkiye. Also, the relation has been found positive, meaning that an increase in the MI leads to an increase in remittances. This relation has been found valid in both short-run and long-run.

Different from previously mentioned studies, Anaele and Nyenke (2021)'s study investigates the effect of fiscal policy on the MI of Nigeria, instead of investigating the relation between some specific variables. To do that, researchers have examined 1981-2018 data and employed the OLS methodology. Results of the analysis have shown that government capital expenditure and government recurrent expenditure are negatively related to the MI whereas government external debt is the opposite.

In addition to studies that examine economic misery and other variables, Monnin (2014) investigates the relation between inflation and income inequality in 10 OECD countries for the period 1971-2010. The econometric methodology employed in the study is generalized least square. According to the results of the research, there has been found a U-shaped relation between long-run inflation and income inequality. At low levels of inflation, higher income inequality values have been observed. As inflation increases income inequality value decreases until a specific point of inflation, later it starts to increase again. According to the study, the mechanism behind these behaviors of the variables was not clear so it requires to be investigated comprehensively.

As can be seen from the previous studies, the relationship between economic misery and income inequality, and the relationship between these variables and other socioeconomic variables are mostly similar. Except for one study that has been evaluated above, all results of the studies are in line with each other. On the other hand, there are not many studies in the literature on this subject specifically for Türkiye. As far as we know, there are two studies in the literature analyzing the misery index and income inequality in Türkiye. One study evaluated Türkiye in the context of fragile economies (Tunali & Akdag, 2023) and the other study examined the relationship between economic discomfort and "economic and political factors" involved in inequality. No

study directly evaluates the misery index and income inequality only in Türkiye. Therefore, our study fills this gap in the literature. In this respect, our study differs from the existing literature and offers results specifically for Türkiye. It contributes to the literature with the results it presents that inflation and unemployment together increase income inequality in Türkiye (1988-2021).

This paper is structured as follows: In the first section of the paper, we review the existing literature. In the second section of the paper, by introducing the data and methodology, we study the relationship between the misery index and income inequality in the example of Türkiye. We include the findings in this section and conclude by making a general evaluation in the last section.

## 2. Data, Methodology and Findings

In this study, the relation between income inequality and economic misery has been investigated. For this objective to be achieved two indices are employed as proxies. The first index which represents the level of income inequality is the Gini coefficient. The second index which represents the level of economic misery, is Okun's misery index. The following equation shows the modeling of the relation between variables.

$$GINI_t = \alpha_0 + \alpha_1 MI_t + \varepsilon_t \quad (1)$$

Data for the Gini coefficient has been obtained from the World Inequality Database (WID). Okun's misery index is simply the summation of the unemployment rate and inflation rate. Therefore, to calculate MI, the unemployment rate, and inflation rate data have been obtained from the Turkish Statistical Institute's Labor Force Statistics Database and the World Bank's World Development Indicators Database respectively. The period of the data is from 1988 to 2021. Descriptive statistics of the dataset have been represented in Table 1.

*Table 1: Descriptive Statistics*

	Obs.	Mean	St. Dev.	Min	Max.
MI	34	61.97	30.088574	16.27	113.71
GINI	34	46.83	2.581443	57.69	67.26

The analysis has been made by employing the Autoregressive Distributed Lags (ARDL) Bounds Test approach. In this approach variation in the series' unit root order (I(0) and I(1)) is not an obstacle to use this test but having second-order unit root, I(2), is a violation of the assumptions of this test. In this perspective, firstly, the stationarity tests have been made. Table 2 shows the results of the Augmented Dickey-Fuller (ADF) unit root test results. According to the test results, both variables are not stationary at the level, but they become stationary when their first difference is taken.



Table 2: ADF Unit Root Test

	I(0)	I(1)	Result
<b>Intercept</b>			
GINI	-1.656979 (0.4417)	-3.454848 (0.0170)	I(1)
MI	-1.138134 (0.6887)	-5.584844 (0.0001)	I(1)
<b>Intercept and Trend</b>			
GINI	-1.549424 (0.7861)	-3.753516 (0.0344)	I(1)
MI	-2.301806 (0.4199)	-5.512940 (0.0004)	I(1)

Note: Values in parentheses represent the probability values and optimum lag length determined by using the *t*-statistic.

After unit root tests, ARDL modeling has taken place. To determine the optimum lag length Akaike Information Criterion (AIC) was employed. According to the model selection results, ARDL(3,1) is the optimum order. The ARDL model equation is as follows:

$$\Delta GINI_t = \alpha_0 + \sum_{i=1}^p \beta_{1i} \Delta GINI_{t-i} + \sum_{i=0}^q \beta_{2i} \Delta OMI_{t-i} + \theta_1 GINI_{t-1} + \theta_2 OMI_{t-1} + e_t \quad (2)$$

Here, the coefficients  $\beta_1$  and  $\beta_2$  show the short-term dynamics where  $\theta_1$  and  $\theta_2$  show the long-term dynamics. The bounds test procedure that investigates the long-run relationship between indicators is performed with the help of the F-Test. The test results are displayed in Table 3. According to the ARDL bounds test results, in which the long-term relationship between variables is analyzed, the F test statistic exceeds the upper critical values at 10% and 5% significance levels. Accordingly, it is accepted that there is a long-term relationship between Gini which is a proxy for income inequality, and MI which is a proxy for economic misery.

Table 3: ARDL Bounds Test

	F-Statistics	k	Significance Level	I(0)	I(1)
Dependent Variable GINI	7.0751	1	10%	4.29	5.08
			5%	5.395	6.35
			1%	8.17	9.285

Since there has been a long-term relation between the above-mentioned indicators it is convenient to investigate short-term and long-term coefficients estimations. Firstly, the long-term parameter estimation results are presented in Table 4. According to the long-term estimation results, there has been a statistically significant relation between indicators and an increase in economic misery by one unit causing an increase in income inequality by 0.06 units. This result is in line with the existing literature. Short-term parameter estimates are also included in the same table. As can be seen in Table 4, a statistically significant relation between indicators in the short term has not been observed. Yet, the error correction mechanism has been detected statistically significant and working by the results.

*Table 4: ARDL Parameter Estimation*

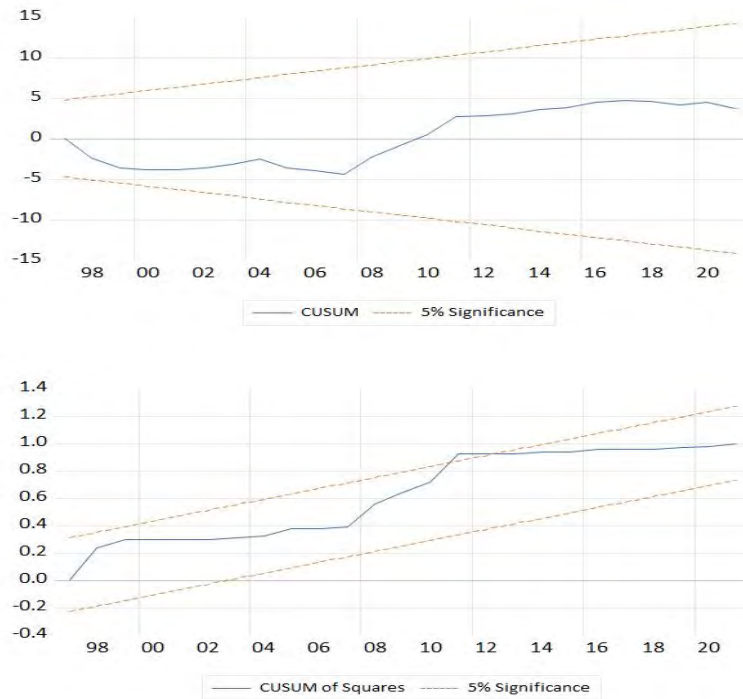
<b>Long-Term</b>			
Dependent Variable: GINI	Coefficient	t-statistics	Prob.
MI	0.064934	5.786561	0.0000
<b>Short-Term</b>			
c	22.69455	3.812558	0.0008
D(GINI(-1))	0.138108	0.854411	0.4010
D(GINI(-2))	0.273276	1.549909	0.1337
D(MI)	0.007163	0.564584	0.5774
<b>Error Correction</b>	<b>-0.387850</b>	<b>-3.836176</b>	<b>0.0008</b>

Later, diagnostics tests have been employed to investigate the reliability of estimation results. These diagnostic tests are the Breusch-Godfrey serial correlation test, the Jarque-Bera normality test, the Breusch-Pagan-Godfrey heteroskedasticity, and the Ramsey RESET test. In Table 5, the results of the above-mentioned diagnostics are presented.

*Table 5: Diagnostic Tests*

Breusch-Godfrey Correlation test	Serial	Jarque-Bera Normality Test	Breusch-Pagan-Godfrey Heteroskedasticity Test	Ramsey RESET Test
0.511494 (0.6063)		0.3472 (0.84)	1.102487 (0.3840)	3.617923 (0.0692)

Later, the stability properties of the model were investigated by employing CUSUM and CUSUM of squares tests. In the following Graph 1 results of the CUSUM test and CUSUM of Squares test have been visualized.



*Graph 1: Parameter Stability Tests*

### 3. Conclusion

The MI measures economic performance across two broad macroeconomic indicators. A higher level of either of these variables has negative effects on national welfare. Another economic phenomenon that concerns the economic welfare of society is income inequality. Based on this information, the central theme of this paper is to evaluate the impact of a basic economic trend indicator of a nation on income inequality, another versatile indicator. In the study, which started with a general evaluation of the literature, we evaluated the effect of the misery index on income inequality on data from Türkiye. Studying Türkiye as a sample makes this study important, especially since it experiences significant effects of inflation and has a significant income gap. There are not many studies in the literature on this subject specifically for Türkiye. As far as we know, there are two studies in the literature analyzing the misery index and income inequality for Türkiye. One study evaluated Türkiye in the context of fragile economies (Tunali & Akdag, 2023) and the other study examined the relationship between economic discomfort and economic and political factors involved in inequality (Beşkaya, 2013). No study directly evaluates the misery index and income inequality only in Türkiye. Therefore, our study fills this gap in the literature. Our analysis results showed that there is a long-term relationship between the misery index and income inequality in Türkiye (1988-2021). According to the long-term estimation results an increase in economic misery by one unit causing an increase in income inequality by 0.06 units in Türkiye. In other words, inflation and unemployment in Türkiye, in addition to all their negative effects, also deepen the gap in income inequality. This reveals a result consistent with many studies in the literature (Bayar & Aytemiz, 2019; Ghaffary Fard et al. 2022; Sotoudeh Nia Korrani & Ziya 2022). Therefore, while policymakers

are making policies on inflation and unemployment, they should not ignore that the issue will also have an income inequality aspect.

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## | ABSTRACTS & PROCEEDINGS |

14. International Conference on Political Economy

### **Inflation, Employment, and Inequality**

December 14-15, 2023, İstanbul, Turkey, [www.icopec.org](http://www.icopec.org)

Sotoudeh Nia Korrani, S., & Ziya, A. (2022). The effect of economic growth and misery index on income inequality in Iran (Autoregressive Distributed Lag (ARDL)). *International Journal of Nonlinear Analysis and Applications*.

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# Exploring the Impact of Entrepreneurship on Personal Income Inequality: A Machine Learning Approach

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## Abstract

*This study particularly aims at investigating the effects of entrepreneurship on personal income inequality employing machine learning algorithms. Economic theory does not have a clear consensus on the link between entrepreneurship and income inequality. Therefore, this issue is important to investigate. Personal income inequality model has been trained by using both random forest and CatBoost algorithms and the contributions of model inputs in the prediction of personal income inequality have interpreted by making use of the Tree SHAP algorithms with swarmplots. The data employed in the empirical analysis is 2019 TURKSTAT Household Budget Survey in Türkiye with a sample size of 1275 household per head. The findings of the study shows that: (i) Entrepreneurial income is the key determinant affecting personal income inequality and positively related to personal income inequality; (ii) Low entrepreneurial income and high transfer income increase personal income equality, while individuals with high entrepreneurship and high transfer income decrease it; (iii) Household per head having high labor, transfer, real estate and interest income contribute to personal income inequality; Finally, to increase personal income equality, the results of the study suggest the implementation of the following policy measures: Instead of increasing government transfer expenditure, the entrepreneurship incentive programs can help to increase personal income equality. Incentives should be created to target middle-aged and highly educated individuals.*

*Keywords: Entrepreneurship, Personal income inequality, Machine learning algorithms, Tree SHAP*

*JEL Codes: C60, D63, L26*

## 1. Introduction

This study aims to examine the correlation between the entrepreneurship and personal income inequality in Türkiye. Additionally, it analyzes the interactions between socio-demographic factors of income inequality. In fact, entrepreneurship have significant income redistribution implications. Conversely, it may have positive or negative effects on income distribution contingent. Income inequality is determined by many factors including entrepreneurship. The Kuznets curve, proposed by Kuznets (1955), suggests income inequality follows an inverted-U shape during economic development. However, studies challenge its validity, showing income inequality doesn't necessarily decrease after a certain income per capita level. Other factors, including world forces, social norms, ownership of real and human capital, and government role, must be considered to explain income inequality's determinants (Mergulhão, 2017; Tridico, 2018).

Entrepreneurship can be viewed from two perspectives: the opportunity perspective, which sees it as a source of innovation and growth, and the necessity perspective, which sees it as a survival strategy (Halvarsson, Korpi, & Wennberg, 2018). The opportunity perspective suggests that entrepreneurship can increase income inequality by rewarding successful entrepreneurs with higher incomes and creating skill-biased technological change (Atems, & Shand, 2018; Ragoubi, & Harbi, 2018). The necessity perspective, on the other hand, sees entrepreneurship as a survival strategy, providing income and employment opportunities for marginalized groups (Lippmann, Davis, & Aldrich, 2005; Halvarsson, Korpi, & Wennberg, 2018). The net effect of entrepreneurship on income inequality depends on the context and characteristics of entrepreneurs, such as motivation, education, sector, and legal status. Therefore, a comprehensive and nuanced analysis of the relationship between entrepreneurship and income inequality requires to determine the net effect of entrepreneurship on income inequality.

Although there is a limited number of studies available, none of them examine the personal income inequality in Türkiye. A concise analysis of the existing literature reveals the significant aspects the linkage between entrepreneurship and income inequality. Firstly, gini coefficient and other indices are utilized as measurement of income inequality (Aceytuno et al., 2020; Atems & Shand, 2018; Halvarsson & Korpi, 2016; Lecuna, 2020; Martín et al., 2010; Mohamad et al., 2021; Rani & Kumar, 2021). However, it is important to note that personal income inequality measurements aren't employed. Secondly, limited studies explore the relationship between entrepreneurship and income inequality in Türkiye. Thirdly, there is also a scarcity of studies that thoroughly examine the interactions between the socio-demographic determinants of income inequality. Fourthly, none of the studies review employ machine learning algorithms to analyze the impact of entrepreneurship on personal income inequality. Lastly, a limited number of studies undertake a comparison of the performance of the random forest algorithm and CatBoost algorithms in training their models.

This study is expected to make a significant contribution to the existing literature in several ways. Firstly, it seeks to conduct an empirical examination of how entrepreneurship affect personal income inequality in Türkiye. Secondly, while previous studies on the subject have not employed personal inequality measurements, this research employs the Gini admissible personal inequality indexes (GAPII) as an overarching measure of inequality in the empirical analysis. Thirdly, this study also contributes to the literature by analyzing the interaction between socio-demographic factors of income inequality. Fourthly, although none of the studies employ machine learning algorithms to analyze the impact of entrepreneurship on income inequality, this study utilizes machine learning algorithms, which include TreeSHAP, randomforest and CatBoost. Lastly, it contributes to the literature by comparing the performance of the random forest algorithm and the CatBoost algorithms in training their models.

## 2. Literature Review

The relationship between entrepreneurship and income inequality is a complex and controversial topic in the literature. Several studies use different measures, methods, and samples to analyze this relationship, and have reached different conclusions. Many studies find the negative relationship between entrepreneurship and income inequality. Martín et al. (2010) use a multiequational model to analyze the effects of entrepreneurship, income distribution, and economic growth on each other, using data from 25 countries for the period 2000-2006. They find a positive relationship between entrepreneurship and economic growth, and a negative relationship between income distribution and entrepreneurship. Moreover, Lecuna (2020) investigates the impact of entrepreneurship on income inequality using a fixed effects model for 54 countries in the period 2006-2012. He finds that total entrepreneurial activity is linked to improving income inequality, and that

policies targeting informal sectors can decrease income inequalities. Finally, Mohamad et al. (2021) study the relationship between entrepreneurship and income inequality in 47 developing countries using GMM and OLS methods and the period from 2009 to 2017. They conclude that entrepreneurship reduces income inequality.

Several studies conclude to the positive relationship between entrepreneurship and income inequality. An analysis is conducted by Halvarsson and Korpi (2016), who use a regression-based income decomposition and a generalized entropy index to analyze the contribution of entrepreneurship to income inequality at both ends of the distribution, using data from Sweden for the years 2005 and 2013. They find that entrepreneurs account for bottom-end inequality, while incorporated self-employed individuals contribute to top-end inequality. Furthermore, Atems and Shand (2018) employ a system generalized method of moments (GMM) estimator and an ordinary least squares (OLS) estimation to analyze the impact of entrepreneurship on income inequality, using US state-level data for the period 1989-2013. They find a positive relationship between entrepreneurship and income inequality, and that policies encouraging entrepreneurship may be detrimental to growth. A few studies obtain empirical evidence that entrepreneurship doesn't affect income inequality. Rani and Kumar (2021) examine the impact of entrepreneurial activities on income inequality and human development in BRICS countries using fixed effect and random effect models and data for the period 2004-2015. They find that entrepreneurial activities have a neutral impact on income inequality, and a positive impact on human development in BRICS nations.

In conclusion, the literature on the relationship between entrepreneurship and income inequality is rich and diverse, but also inconclusive and contradictory. Different studies have used different definitions, measures, methods, and samples of entrepreneurship and income inequality, and have reached different results and implications. Therefore, a more comprehensive and consistent approach is needed to understand and address the complex and dynamic relationship between entrepreneurship and income inequality.

### 3. Dataset and methodology

This study uses the Household Budget Survey in 2019 from the Turkish Statistical Institute (TURKSTAT) household datasets (N= 1275), which have been adjusted in various ways. The data is produced through the utilization of the "OECD-modified" equivalence scale technique formulated by Hagenaars, de Vos, and Zaidi (1994), which permits modifications to be made based on specific coefficients. This method includes yearly total income, labor, transfer, real estate, interest, and entrepreneurial incomes data, which are redistributed and included in the analysis.

#### 3.1. Model and methodology

To investigate the linkage between entrepreneurship and personal income inequality, we employ entrepreneurial income as measurement of entrepreneurship in the empirical model of personal income inequality. The model is also extended with socio-demographic variables (individuals' age, gender, income, education level) and other income components (labor, transfer, real estate, interest and entrepreneurial incomes). A detail of variables is presented in Table 1.



*Table 2 Data sources and variable definitions.*

Variables	Measurement	Data Sources
NGI	Gini-admissible Personal Inequality Index	Own Calculation (from Household Budget Survey)
ENTREPRENEUR	Yearly entrepreneurial income (TL)	
AGE	Individual's Age	
EDUC	Education level (1= no education level, 2=Primary School, 3= Secondary School, 4= High School, 5=Vocational School of Higher Education, 6= University, 7= Postgraduate)	
EMPLOYMENT	Employment status (0=not working, 1= working)	Household Budget Survey
LABOR	Yearly labor income (TL)	
TRANSFER	Yearly transfer income (TL)	
REALESTATE	Yearly real estate income (TL)	
INTEREST	Yearly interest income (TL)	

This study employs machine learning algorithms in the empirical analysis due to concerns regarding arbitrary estimation and inefficiency in non-linear circumstances (Salas-Rojo & Rodríguez, 2022; Han, 2022). Traditional methodologies, such as biases and model selection problems, impose restrictions on parameter-based analyses and non-parametric tests. To address these inefficiencies, tree classification algorithms, which are devoid of biases and model selection problems, are preferred over traditional methodologies. The machine learning algorithms utilized in this study comprise random forest, CatBoost, and Tree SHAP, which is a variant of SHAP. In dataset training process, random forest and CatBoost regressors are utilized. Following the training of the model, Tree SHAP is employed to interpret the contributions of the model's inputs (i.e., determinants of personal income inequality-features) in predicting the model's output (i.e., personal income inequality variable-output of the model)<sup>1</sup>. The random forest algorithm, which is a machine learning technique, employs multiple decision trees to carry out classification or regression tasks. It is based on the concept of ensemble learning, wherein the predictions of multiple models are combined to enhance overall accuracy and reduce the risk of overfitting (Breiman, 2001). The random forest algorithm can be formulated as follows (Breiman, 2001):

$$\hat{f}_B(x) = \frac{1}{B} \sum_{b=1}^B T_b(x).$$

where  $\hat{f}_B(x)$  denotes the predicted output of the random forest for the input  $x$ ;  $B$  is called as the number of trees in the random forest;  $T_b(x)$  represents the predicted output of the  $b$ -th tree for the input  $x$ . The underlying principle behind this formula is that through the process of averaging the predictions of numerous trees, we can diminish the variance and noise caused by each individual tree, thereby achieving a more consistent and accurate prediction.

CatBoost is a gradient boosting toolkit that can handle categorical features and reduce overfitting. It uses an additive ensemble of oblivious trees as the final predictor, where each oblivious tree is a function that maps the

<sup>1</sup> We utilize Tree SHAP since machine learning algorithms couldn't be directly interpreted for causal inference.

input features to a prediction value (Prokhorenkova et al., 2018). The prediction value of the ensemble is given by:

$$F(x) = F_0(x) + \sum_{t=1}^T \eta f_t(x)$$

where  $F_0(x)$  is the initial approximation,  $T$  is the number of trees,  $\eta$  is the learning rate, and  $f_t(x)$  is the prediction value of the  $t$ -th tree (Prokhorenkova et al., 2018). CatBoost also uses a technique called random permutations to reduce the bias of the target-based encoding and avoid overfitting (Dorogush et al., 2018).

SHAP (Shapley Additive Explanations) is a machine learning technique that is presently employed to elucidate the output derived from different machine learning models. Specifically, Tree SHAP is intended to clarify the results obtained from models based on trees. SHAP exhibits consistency in estimating the degree of significance associated with variables, rendering its findings easily interpretable. It bears resemblance to the Shapley value approach (Han, 2022) and was introduced by Lundberg and Lee (2017), providing estimation results that are interpretable. The formulation of TreeSHAP for regression can be described as follows:

$$\phi_j = \sum_{S \subseteq F \setminus \{j\}} \frac{|S|!(|F|-|S|-1)!}{|F|!} [f_x(S \cup \{j\}) - f_x(S)] \quad (1)$$

where  $\phi_j$  is the SHAP value for feature  $j$ ;  $S$  is a subset of features excluding  $j$ ;  $F$  is the set of all features;  $|S|$  is the number of features in subset  $S$ ;  $|F|$  is the total number of features;  $f_x(S)$  is the prediction of the model with features in set  $S$ ;  $f_x(S \cup \{j\})$  is the prediction of the model with features in set  $S$  including feature  $j$ .

#### 4. Results

This section presents the findings derived from the empirical analysis of the personal inequality model through machine learning algorithms. Initially, the estimation results of the random forest and CatBoost are illustrated and interpreted, followed by an analysis of the significance of variables. In Figure 1, the color blue (red) signifies low (high) values of personal income inequality features. Leveraging this information, we can interpret Figure 1 as follows. A decrease in entrepreneurial income level leads to a reduction in the SHAP value. This suggests a positive correlation between personal income inequality and entrepreneurial income. Similarly, higher values of LABOR, TRANSFER, REALESTATE, EDUC, and INTEREST are associated with high SHAP values, indicating that these features contribute to the prediction of personal income inequality.

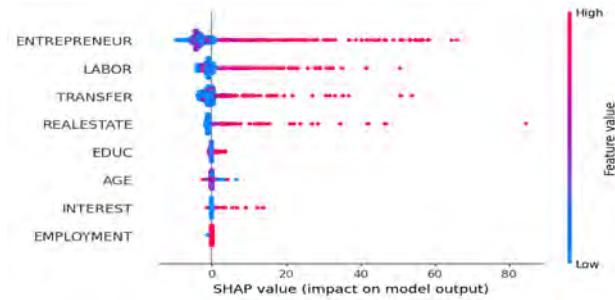
Table 1: Evaluation results.

Algorithms	Evaluation Metrics	
	R <sup>2</sup>	RMSE
Random Forest	0.81	6.34
CatBoost	0.86	5.37

Table 1 presents the evaluation results based on the evaluation metrics for each model. Upon comparing the two models, the evaluation values exhibit a slightly increase in all evaluation metrics for CatBoost compared to random forest algorithm. The interpretation and analysis of algorithms are summarized as follows: CatBoost

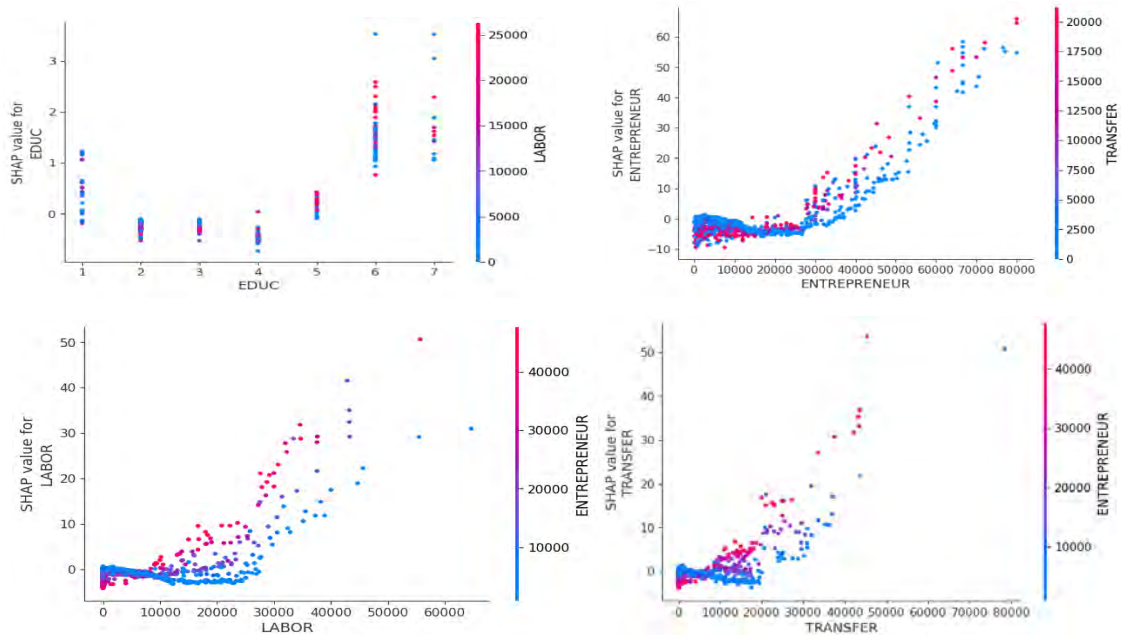
has greater explanatory power and less prediction error in the evaluation results. Consequently, CatBoost appears to be more reliable and appropriate for the interpretation and analysis of variable importance.

*Fig. 1: CatBoost SHAP summary plot.*



*Note: (1) The vertical order indicates the relative importance of the variable. (2) The red color represents a high value, while the blue color shows a low value of the variable. (3) The influence of the variable's value on the output is shown on the horizontal axis. (4) The dots' density indicates how intense they are.*

*Fig. 2: Effects of interaction between typical features using CatBoost.*



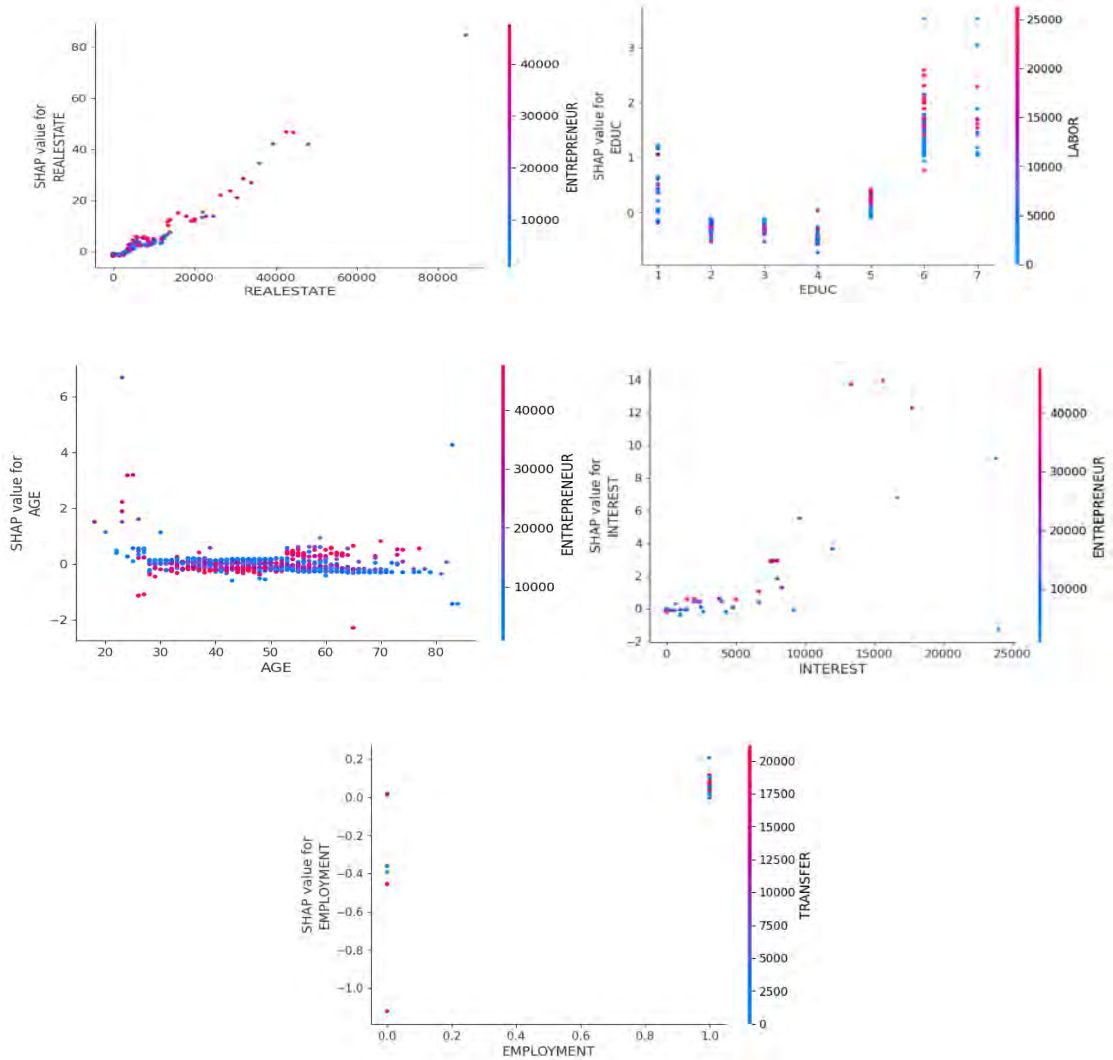


Figure 2 shows the impact of interaction between typical features and SHAP dependence plots. Low entrepreneurial income and high transfer income reduce personal income inequality, while individuals with high entrepreneurship and high transfer income increase it. Individuals with low transfer income and high entrepreneurial income contribute less to inequality compared to those with high entrepreneurship and transfer income. However, as labor income increases, individuals with high entrepreneurial income increase inequality more. High education and labor income contribute more to inequality, but individuals with low labor income contribute the most. Individuals with both entrepreneurial and interest incomes contribute more to personal income inequality. High entrepreneurial income up to age 50 reduces inequality, while those over 50 have higher inequality. Unemployed individuals with high transfer income reduce inequality more, but some with low transfer income can distort the distribution.

## 5. Conclusions and Policy Recommendations

This study investigates the effects of entrepreneurship on personal income inequality under various socio-demographic and income components and provides valuable insights into the factors influencing personal income inequality. These findings have several significant conclusions and implications for economic policy makers. Entrepreneurial income is identified as the most critical factor influencing positively personal income inequality. Education stands out as the most crucial socio-demographic factor that affects personal income inequality, indicating that individuals with having more education level are more likely to contribute personal income inequality. Other income components (labor, transfer, real estate and interest incomes) have a positive impact on personal income inequality. Among socio-demographic groups, highly educated young and middle-aged individuals exhibit a higher likelihood of decreasing in personal income inequality. This suggests that targeted policies and marketing efforts should focus on these demographics to increase income equality. Finally, this study compares machine learning algorithms and demonstrates that CatBoost has a more explanatory power, and it is reliable machine learning algorithm for interpreting variable importance compared to the random forest algorithm.

Policymakers should consider these findings when designing strategies to mitigate personal income inequality. To achieve a more equitable distribution of income, it is first necessary to regulate the distribution of transfer income to individuals. In particular, transfer expenditures for individuals with high entrepreneurial income should be reduced and restructured to promote entrepreneurship. Economic policies that will ensure a fairer wage distribution according to education level in the labor market should be implemented. To reduce income inequality, incentives for entrepreneurial activities should be provided for the young and middle-aged groups. Transfer income support should be increased for unemployed individuals and those without any other source of income.

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## **| ABSTRACTS & PROCEEDINGS |**

14. International Conference on Political Economy

### **Inflation, Employment, and Inequality**

December 14-15, 2023, İstanbul, Turkey, [www.icopec.org](http://www.icopec.org)

Tridico, P. (2018). The determinants of income inequality in OECD countries. *Cambridge Journal of Economics*, 42(4), 1009-1042. <https://doi.org/10.1093/cje/bex069>

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## Demographic Changes, Economic Growth and Income Inequality: Pension Schemes and Macroeconomic Environment in Greece

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### **Abstract**

*In light of the upcoming ageing and population decline combined with the already high state subsidy on pensions, the Greek government capitalized the auxiliary pension in order to stimulate the efficiency and long-term sustainability of the pay-as-you-go (PAYG) pension scheme. Taking this into account and following a “demand-based” theoretical approach, we compare the interaction of the determinants of a pay-as-you-go and a fully funded (FF) pension scheme with the macroeconomic environment aiming to investigate the impact of demographic changes on economic activity and income distribution. Unlike the majority of relevant studies, we consider the pension sector as an integral part of the macroeconomic environment, and we examine which pension scheme is able to manage demographic changes more effectively; not only in terms of state budget, but also in terms of economic growth and income inequality. On this basis, we also highlight the critical role of functional income distribution and trade unions’ bargaining power in determining income inequality and in offsetting the effect of demographic changes on economic activity.*

*Keywords: demographic changes, pension schemes, income inequality, functional income distribution*

*JEL Codes: D31, D33, H55, J11*

### **1. Introduction**

The demographic projections of ageing and simultaneous population decline in the near future in Greece have called into question the sustainability of the already burdened pay-as-you-go (PAYG) defined benefit (DB) pension scheme. In particular, the pension expenditure in Greece in 2018 reached 16.1% of GDP (Eurostat, 2022a), while the state subsidy on pensions amounted to 10.1% of GDP (Pissaridis committee, 2020). These ratios reveal the fragile status of the Greek pension sector, considering that the average of the corresponding ratios of the European Union countries for the same period was 12.4% and 3.1% of GDP respectively.

Furthermore, projections show that the total population of Greece will decline by more than two million over the next 50 years (Eurostat, 2022b) and the life expectancy for a person aged 65 will rise by almost 5 years until 2070 (Eurostat, 2022c), indicating, in addition to population decline, a gradual increase in ageing. As a consequence, according to the European Union’s “Ageing Working Group” (AWG, 2021), the old-age



dependency ratio<sup>1</sup> will increase from 37.9% in 2019 to 65.2% in 2070, while the pension system dependency ratio<sup>2</sup> will rise from 64% to 75.9% over the same period.

Given the above, the pay-as-you-go scheme is expected to be further strained in the coming decades as ever fewer insured will finance the pensions of ever more retirees. In order to restore the efficiency and long-term sustainability of the pension sector, several studies have recommended, inter alia, the capitalization of a part of the pay-as-you-go scheme, as this could reduce its vulnerability to demographic changes and stimulate economic growth through rising investment and employment (see e.g., Nektarios et al., 2018; Daskalopoulos et al., 2018; Christodoulakis et al., 2018; Pissarides committee, 2020). Eventually, in the light of demographic changes and high state subsidy on pensions, the Greek government recently capitalized the auxiliary pension and adopted the fully funded (FF) defined contribution (DC) method for its calculation<sup>3</sup>.

The relationship between demographic changes and pension schemes has been sufficiently studied by many researchers (see e.g., Fanti & Gori, 2008, 2012; Whitehouse, 2012; Artige et al., 2014; Cipriani, 2014, 2018; Tabata, 2015; Dedry et al., 2017; Alonso-Garcia et al., 2018; Morimoto et al., 2018; Cipriani & Pascucci, 2020; Cipriani & Fiorini, 2021), but the impact of this relationship on economic activity and income distribution has been investigated much less or not at all, as it is not placed in a framework of interaction with the macroeconomic environment. Pension schemes are an integral part of the macroeconomic environment, as they link the functional income distribution (i.e., the distribution of output among the various factors of production) with the disposable income of pensioners, the pension expenditure with the state budget, the demographic changes with economic activity and the social security contributions with the financial side of the economy.

Therefore, unlike the previous approaches, we place the pension sector in a framework of interaction with a dynamic macroeconomic environment aiming to examine the impact of demographic changes on economic activity and income distribution. Specifically, we compare a pay-as-you-go defined benefit and a fully funded defined contribution pension scheme, which represent the recent reform of the Greek pension sector, in order to investigate which of them could manage the upcoming demographic changes in Greece more efficiently, not only in terms of the state budget but also in terms of economic growth and income inequality. Finally, following a “demand-based” approach, we underline the crucial contribution of the functional income distribution and the trade unions’ bargaining power in reducing inequality and offsetting the effects of ageing and population decline on the economy.

## **2. Determinants of pensions and the role of functional income distribution**

The pay-as-you-go and fully funded pension schemes under consideration represent the contributory and auxiliary pension of the Greek social security sector respectively and therefore differ in terms of managing social security contributions, calculating pensions, relating to the real and financial side of the economy and addressing demographic risks. To understand the relationship between the pension schemes and demographic changes, as well as its impact on economic activity and income distribution, we describe the interaction of each scheme with the macroeconomic environment, presenting the determinants of their pensions. Also, to capture

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<sup>1</sup> Old-age dependency ratio (OADR) is the ratio of the total population aged over 65 years to the total population aged between 15 and 65 years.

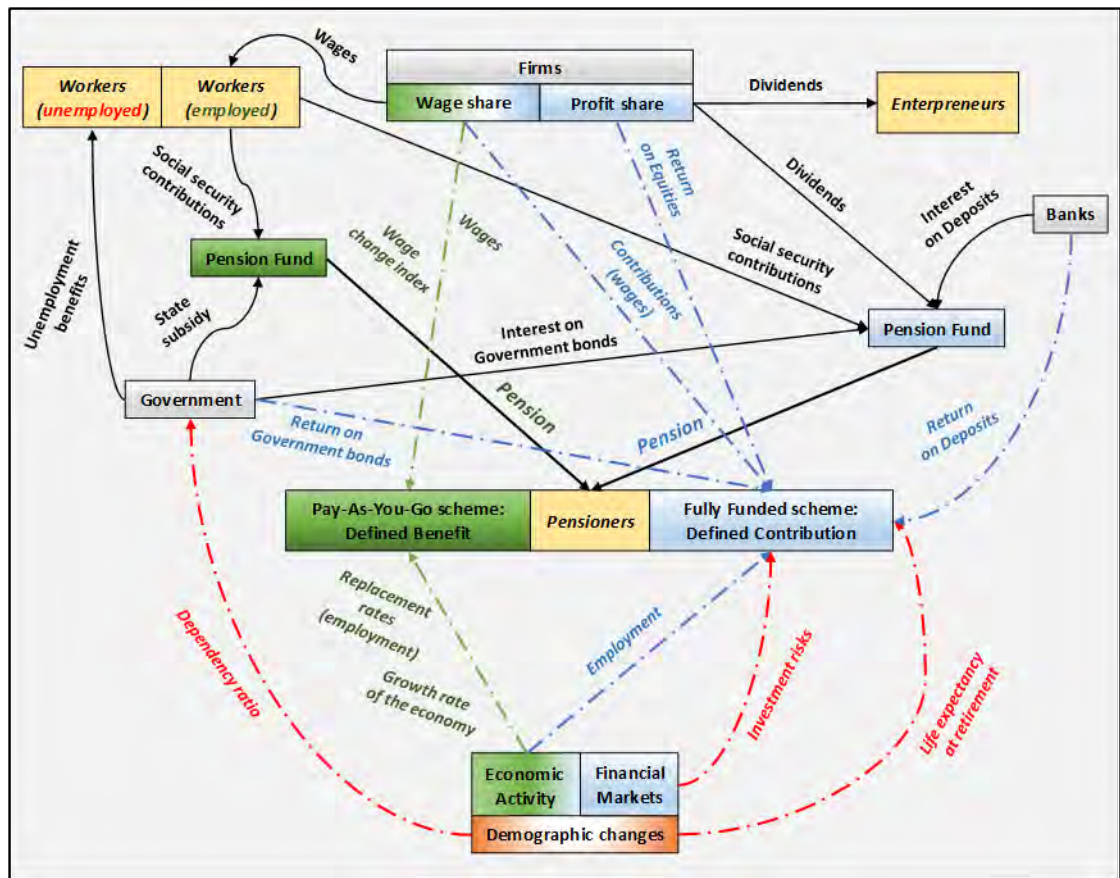
<sup>2</sup> Pension system dependency ratio (SDR) is pensioners-to-employees ratio.

<sup>3</sup> According to Articles 1 & 2 of Law no. 4826/2021 of Greek legislation, the auxiliary pension fund was established, and the funded defined contribution pension scheme is implemented for the calculation of the auxiliary pension.

the effect of this relationship on income inequality, we consider an economy consisting of employed and unemployed workers, who receive wages from firms and unemployment benefits from the government respectively, entrepreneurs, who receive the distributed profits of firms, and pensioners, who receive pensions from the respective pension fund.

Figure (1) illustrates this economy by focusing on the determinants of each pension scheme. The solid black arrows show the flows of income converted into pensions by the two pension funds, as well as the payments to economic agents. On the other hand, the dotted green and blue arrows show the determinants of pensions in the pay-as-you-go and fully funded schemes respectively. These arrows represent the positive relationship between determinants and pensions, while the red arrows represent the negative association of pension schemes with demographic and investment risks.

Figure 1: Determinants of pensions in the Pay-as-you-go and Fully funded pension scheme



The pay-as-you-go scheme is based on "intergenerational solidarity" as the social security contributions of current (employed) workers finance the current pension expenditure and the pensions paid to future pensioners will be financed by the contributions of future workers. Under the defined benefit calculation method, the amount of pension is estimated from each pensioner's pensionable earnings and replacement rates, while any

difference between contributions and pensions is financed by the state budget, as this method does not take demographic risks into account. Moreover, pensionable earnings are adjusted each period based on the wage change index<sup>1</sup>, while the total amount of pension increases annually in line with the rate of change in GDP<sup>2</sup>. Thus, the determinants of pensions are the amount of wages received by each pensioner throughout his or her working life, which reflects pensionable earnings, the years of insurance (employment), which determine replacement rates, and the growth rates of wages and economy, which annually readjust pensionable earnings and pensions respectively.

On the other hand, in the fully funded scheme, the social security contributions do not finance the current pension expenditure. Instead, they are credited into individual accounts by the pension fund and are invested in financial products such as deposits, bonds and equities. Under the (funded) defined contribution calculation method, the amount of pension depends on each pensioner's accumulated contributions and the corresponding returns, as well as on life expectancy at retirement. This method is exposed to investment risks, while, unlike the defined benefit method, it does not allow for deficits between contributions and pensions, as it transfers demographic risks from the government to each individual pensioner. Hence, the determinants of pensions are the amount of contributions paid by each pensioner during his or her working life, which depends on the amount of wages earned and the years of insurance (employment), the returns on the financial products and the life expectancy projections at retirement.

Apart from their different response to demographic changes, pension schemes also differ in their relationship with the real and financial side of the economy. The pay-as-you-go scheme is entirely related to the real side of the economy (wages, wage change index, growth rate of the economy, employment), while the fully funded scheme, in addition to the real side (contributions, employment), is also related to the financial side of the economy (returns on financial products, investment risks). This results mainly from the link of both schemes with the functional income distribution, which, although indirectly, is one of the most important determinants of pensions.

In the pay-as-you-go scheme, pensions are largely influenced by the wage share, as both wages and the wage change index determine the amount of pensionable earnings. In the fully funded scheme, pensions are affected by the wage share, through the amount of social security contributions, but are also connected to the profit share, mainly through the dividends earned by the pension fund from firms. Thus, although the wage share is positively associated with the pay-as-you-go scheme, this is not always the case in the fully funded scheme, as it creates countervailing pressures on pensions. The relationship between pension schemes and functional income distribution is crucial to offset the impact of demographic changes on the economy, as we see in the following section.

### **3. Ageing and population decline**

In this section, we describe the effects of the upcoming ageing and population decline in Greece, on the economic activity, income distribution and state budget, comparing the two pension schemes. We follow a

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<sup>1</sup> According to Article 24 of Law no. 4670/2020 of Greek legislation, from 2025 onwards, pensionable earnings are adjusted each period based on the wage change index.

<sup>2</sup> According to Article 14 of Law no. 4387/2016 and the amendment of the same by Law no. 4670/2020 of Greek legislation, the total amount of the pension is increased from 1.1.2023 per year based on the coefficient resulting from the sum of the annual rate of change of GDP plus the rate of change of the annual general consumer price index of the previous year divided by two. In order not to overburden the presentation of the determinants, we do not consider the effect of inflation on pension schemes.

“demand-based” approach, which considers not only the relationship of wages and pensions with production costs and state subsidy respectively, but also their relationship with the demand for goods. Population decline may lead to a reduction in consumption expenditure, while the continuous increase in the dependency ratio, through the declining labor force and rising life expectancy, may increase the state subsidy on pensions, resulting in a slowdown in economic growth and an increase in public debt.

However, these effects can be compensated, at least in case of the pay-as-you-go scheme, if trade unions are able to benefit from the reduction in the labor force by increasing their bargaining power. According to Screpanti (1996, 2000) and Cassetti (2003), unions' bargaining power is affected by fear of unemployment, which is best reflected in the rate of change of employment or the rate of change of employment rate. Therefore, considering the rate of change of employment rate as the indicator of unions' bargaining power, the reduction in the labor force could increase their bargaining power and their wages, as well as the wage share in national income. Nevertheless, the increase in the wage share does not generate the same (positive) effects on the economies of the two pension schemes in terms of economic growth and income inequality.

### 3.1. Pay-as-you-go pension scheme

In the short run, population decline tends to reduce consumption, demand and output, while the reduction in labor force tends to increase the employment rate of workers, their bargaining power and thus their wages. Rising wages stimulate consumption and potentially offset the impact of population decline on it. So, despite the sharp drop in investment due to increasing production costs, the fall in demand and output becomes milder. The latter allows labor demand to decline slower than the labor force, resulting in a continuous increase in employment rate and wages.

In the medium run, the rising wages and employment rate are reflected in higher pensionable earnings and replacement rates respectively, which gradually raise pensions. Since the propensities to consume out of wages and pensions are greater than the propensity to consume out of profits, and considering the growing number of pensioners (ageing), the growth rate of consumption increases and stimulates the aggregate demand. The higher aggregate demand leads to an increase in labor demand. Consequently, the demographic changes (ageing and population decline) result in a transition of unemployed workers to retirement. As the income from pensions is higher than unemployment benefits, the above further accelerates the growth rate of consumption. Eventually, in the long run, the continuous rise in wages, pensions, employment and consumption not only offsets the impact of demographic changes but also increases the growth rate of the economy.

Rising employment and wages also increase the wage share, which can reduce inequality among all the groups of economic agents under consideration. Since initially the growth rate of output falls, an increase in the wage share reduces the profits distributed by firms. This decreases income disparity at the top of the income distribution, particularly the inequality between entrepreneurs and employed workers. In the medium run, as pensions adjust to rising wages, the income gap between pensioners and employed workers narrows. This declines even further in the long run, as pensions, in addition to the growth rate of wages, are also affected by the growth rate of the economy, which gradually rises. Finally, the continuous transition of unemployed workers to retirement, arising from the decline in labor force and the parallel increase in labor demand, significantly reduces inequality at the bottom of the income distribution.

In the first periods of demographic changes, the increase in state subsidy on pensions, due to the rising dependency ratio, and the decrease in tax revenues, due to population decline, place a major burden on the state budget. Nevertheless, the continuous rise in social security contributions (wages) may partly cover the higher pension expenditure and mitigate the increase in public debt. Afterwards, the gradual recovery of economic activity and the significant increase in employment, through rising tax revenues and decreasing unemployment benefits respectively, can finance the even higher pension expenditure, which increases due to the adjustment of pensions to rising wages. But even if the latter is not always the case, increasing public debt, the acceleration of economic growth due to higher wages, pensions and employment may lead to a reduction in the debt-to-GDP ratio.

### **3.2. Fully funded pension scheme**

In the short run, as in the pay-as-you-go scheme, the reduction in labor force increases the employment rate and the unions' bargaining power. By raising wages, this reduction tends to offset the impact of population decline on consumption. Raising wages also decrease the distributed profits of firms to pension fund. This forces the pension fund to reduce its demand for firms' equities in order to invest in more profitable financial products, despite the increase in its assets due to rising social security contributions. Consequently, in addition to rising production costs, the fall in demand for equities leads firms to further decrease their investments, placing even more downward pressure on aggregate demand.

Although the drop in investment is sharper in the fully funded scheme, the major difference between the two schemes arises from the impact of the wage share and demographic changes on their pensions and is reflected in consumption in the medium run. In the fully funded scheme, the increase in the wage share, due to rising social security contributions (wages), tends to raise pensions, but on the other hand, due to falling firms' distributed profits to pension fund, as well as the decreasing return on equities, it tends to reduce them. Also, unlike the pay-as-you-go scheme, the increase in life expectancy due to population ageing places further downward pressure on pensions.

Therefore, the fully funded scheme generates significantly lower pensions than the pay-as-you-go scheme, in which demographic changes do not affect pensions and the increase in the wage share stimulates them through rising wages (pensionable earnings) and employment (replacement rates). Due to the growing number of pensioners, in the long run, lower pensions slow down the growth rate of consumption. Eventually, the decline in consumption and investment intensifies the implications of demographic changes on economic activity.

As in the pay-as-you-go scheme, rising wage share and the simultaneous reduction in the distributed profits to entrepreneurs are able to decrease the inequality between the latter and employed workers. In contrast to the pay-as-you-go scheme, the countervailing pressures of the wage share in pensions in the fully funded scheme do not allow them to adjust to the growth rate of wages. This widens the income gap between employed workers and pensioners, as the number of the latter increases. Finally, inequality at the bottom of the income distribution is likely to decrease less than in the pay-as-you-go scheme, because the decline in labor force and the parallel reduction in labor demand, due to the falling growth rate of output, could lead the unemployed but also employed workers to retirement.

Despite the increase in the dependency ratio, the state budget is not burdened, since the functioning of the fully funded scheme does not create deficits between social security contributions and pension expenditure. However, even if the fully funded scheme does not directly affect the public debt, it could raise the debt-to-

GDP ratio due to the negative impact of lower pensions on economic activity, e.g., by decreasing tax revenues through the reduction in pensioners' income and/or by slowing down the growth rate of output through the decline in consumption.

#### 4. Conclusions

Several studies (see section 1) have examined the efficiency of different pension schemes, focusing mainly on their relationship with the state budget, and have recommended structural changes in them without considering their interaction with the other sectors of the economy. Most of these studies have recommended, inter alia, the capitalization of a part of the pay-as-you-go scheme, to reduce its vulnerability to demographic changes and stimulate economic growth. Based on these recommendations, and in light of the upcoming ageing and population decline and the high state subsidy on pensions, the Greek government capitalized the auxiliary pension to stimulate the efficiency and long-term sustainability of the pay-as-you-go pension scheme. Unlike these studies, in this paper, by placing a pay-as-you-go and a fully funded pension scheme in the macroeconomic environment and examining their interaction with it, we described the potential impact of the upcoming ageing and population decline in Greece not only on the state budget but also on economic activity and income distribution.

According to the results, it was observed that under the appropriate conditions (increasing trade unions' bargaining power), the pay-as-you-go scheme can manage demographic changes more effectively than the fully funded scheme, as it can be not only sustainable but also efficient for the economy. In particular, it appears that it can contribute to the recovery of economic activity through increasing wages and pensions, reduce income inequality across the whole range of the income distribution by rising wage share and employment, and, despite the increase in state subsidy on pensions, lead to a lower debt-to-GDP ratio in the long run. On the other hand, the fully funded scheme, although it does not directly burden the state budget, intensifies the implications of demographic changes on economic activity and widens the income gap between pensioners and the other groups of economic agents, because of the countervailing effect of increasing wage share on pensions.

The constraints of the analysis are clear, since the response of pensions schemes to demographic risks, as well as their effects on the economy, vary depending on the conditions of each period and the specific characteristics of each economy, such as the intensity of demographic changes, the openness of the economy, the demand regime, the propensities to consume out of income from different sources, the share of consumption and investment in national output, the labor and social security institutions, the investment risks, etc. However, these constraints reveal the complexity of the pension sector and underline the main contribution of this study, which is to highlight the importance of examining each pension scheme as an integral part of the macroeconomic environment in order to understand its overall impact on economic activity and income distribution.

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## The Effect of the Global Energy Crisis After the Russia-Ukraine War on Energy Markets

### Rusya-Ukrayna Savaşı Sonrası Küresel Enerji Krizinin Enerji Piyasalarına Etkisi

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#### Abstract

*Energy demand has generally shown an increasing trend in the world with economic growth. Especially after World War II, energy consumption and demand began to increase rapidly. Developments such as the development of technology, industrialization, transportation, infrastructure and increase in international trade have been effective in increasing energy demand. Both supply and demand imbalance and political, military or economic events in the international arena have affected the energy markets. While production and energy demand decreased during the Covid-19 epidemic in recent years, production and energy demand began to increase rapidly as the epidemic lost its effect in the world. EU countries, which especially meet their energy needs from Russia, have turned to other supply sources with the Russia-Ukraine war. The aim of this study is to examine how EU countries responded to the energy crisis through demand, substitution and supply, using the descriptive analysis method. The share of liquid natural gas increased and the share of Russia decreased in the energy products import of EU.*

*Keywords: Energy, Energy Crisis, Energy Supply, Trade.*

*JEL Codes: F14, F19*

#### 1. Giriş

Ekonomik büyüme ile aynı trendi takip eden enerji talebi ve tüketimi özellikle 2. Dünya Savaşı'ndan sonra hızla artmaya başlamıştır. 1900'li yılların başında enerji kaynağı olarak büyük oranda kömür kullanılmaktaydı. 1920'li yıllarda ise petrol, karayolu ve deniz taşımacılığı ile ısınma için kullanılmaya başlanmıştır. Ham petrolün yanı sıra doğalgaz tüketimi de daha yavaş bir hızla artmaya başlamıştır. Elektrik üretiminde, ısınma ve yemek pişirmede artan doğalgaz kullanımı, 1920'de küresel enerji tüketiminin %1'ini oluştururken, 2019'da %22'sini oluşturmuştur. Günümüzde, petrol, kömür ve doğalgazdan oluşan üç ana fosil yakıtın toplam enerji tüketimindeki payı %83'tür (World Bank, 2022: 29-31). Küresel ekonominin petrole olan bağımlılığı 1970'lerden beri önemli ölçüde azalmıştır. Örneğin, petrol yoğunluğu (yani bir birim GSYİH üretmek için gereken petrol miktarı) 1970'de 0.12 ton petrol eşdeğerinden (tep) 2022'de 0,05'e düşmüştür. Azalmanın büyük kısmı ulaştırma sektöründeki verimlilik iyileştirmelerinin ve petrol yerine diğer enerji kaynaklarının kullanılmasının sonucudur. Yenilenebilir enerjiye geçiş aynı zamanda fosil yakıtlara olan bağımlılığın azalması anlamına da gelmektedir ve bu da günümüzde petrole olan talebin daha yavaş büyümesine yol açmaktadır (World Bank, 2023: 13).

Çoğu zaman büyüme trendi izleyen üretim ve enerji talebinde Covid-19 salgını esnasında uygulanan kısıtlamalar ile 2019 yılından itibaren tüm dünyada ciddi bir azalış yaşanmıştır. 2021'de kısıtlamaların kaldırılmasıyla küresel ekonominin enerji sistemi güçlü bir toparlanma göstermiştir (BP, 2022: 3). Artan

üretim ve enerji talebinin ardından 24 Şubat 2022'de Rusya'nın Ukrayna'yı işgali küresel bir enerji krizi yaşanmasına yol açmıştır. Rusya, dünyanın en büyük fosil yakıt ihracatçısıdır ve özellikle Avrupa için önemli bir tedarikçidir. 2021'de AB'nde tüketilen tüm enerjinin dörtte biri Rusya'dan alınmıştır (IEA, 2023a). Rusya'nın Avrupa'ya Kuzey Akım boru hattından doğalgaz sevkiyatını süresiz olarak kesmesinden sonra elektrik ve doğalgaz fiyat artışları özellikle Avrupa'da hızlanmıştır. Avrupa ülkelerinin Rusya'dan doğalgaz ithalatı %40'tan %9'a düşerken, Avrupa'nın sıvılaştırılmış doğalgaz (Lng) ithalatı da %70 oranında artmıştır (Kavukçu, 2022: 3-4).

Rusya'nın OECD (Ekonomik Kalkınma ve İşbirliği Örgütü) üyesi Avrupa ülkelerine doğalgaz ihracatı 2022'de bir önceki yıla göre tahmini %50 (83 milyar metreküp) düşerek 1980'lerin ortasından bu yana en düşük seviyesine gerilemiştir. Türkiye'ye yapılan teslimatlar bir önceki yıla göre %18 azalırken, Avrupa Birliği'ne gaz arzı yarıdan fazla azalarak 2021 ile karşılaştırıldığında 78 milyar metreküplük bir düşüşe karşılık gelmiştir. Rusya, Mayıs 2022'de Avrupalı şirketlere bir dizi yaptırım uygulamış ve ardından Rus doğalgaz şirketi Gazprom, Yamal-Avrupa boru hattını kullanmayı bırakacağını duyurmuştur. Gazprom Haziran ortasından itibaren Kuzey Akımı üzerinden gaz akışını kademeli olarak azaltmış ve Ağustos ayı sonuna kadar boru hattı üzerinden gaz tedarikini tamamen durdurmuştur. Eylül ayından itibaren yalnızca üç boru hattı sistemi (Ukrayna transit güzergâhı, Mavi Akım ve Türk Akım) çalışır durumda kalmıştır. Rusya'nın OECD Avrupa'ya doğalgaz arzı 2022'nin dördüncü çeyreğinde tahmini olarak %70 oranında (25 milyar metreküp) düşmüştür (IEA, 2022: 42).

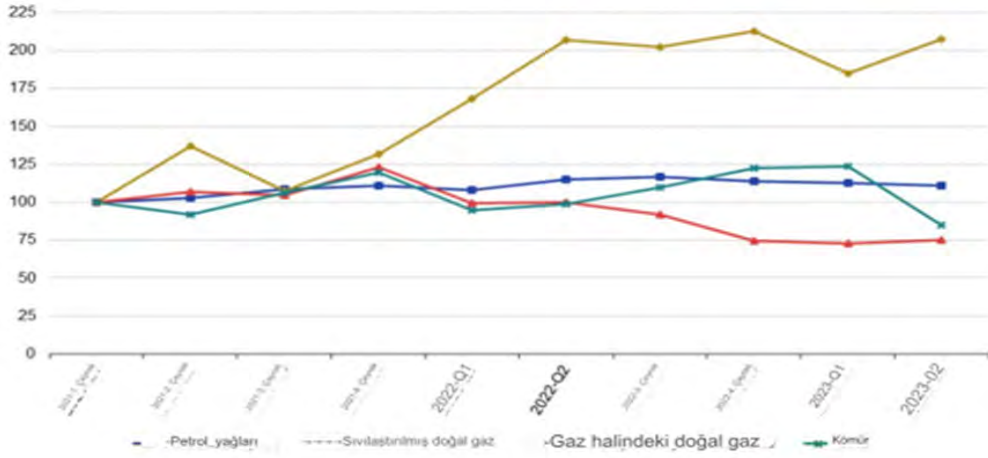
Enerji arz sıkıntısına karşı AB üyesi ülkelerde bazı nükleer santrallerin acil durum rezervi olabileceği için kapatılmasının ertelenmesine karar verilmiştir (Kavukçu, 2022: 5). Japonya, İsveç ve Belçika gibi bazı ülkeler nükleer enerji santrallerinin kullanım ömürlerini uzatma kararı almışlar, nükleer enerji santrali bulunmayan ülkeler de nükleer santraller kurmaya yönelmişlerdir. Almanya gibi Avrupa ülkeleri Rusya'ya enerji bağımlılıklarını ve doğalgaz tüketimlerini azaltmak amacıyla kapatılması yönünde karar alınan kömür santrallerini yeniden faaliyete geçirme ve kömür kullanmayı sürdürme kararı almışlardır (Özdemir Daşcıoğlu, 2022: 4). Ayrıca AB üyeleri, gaz depolama yükümlülükleri getirerek verimliliği artırma ve yenilenebilir enerji kaynaklarını daha fazla kullanma kararı almışlardır. Yeterli petrol arzı sağlamak için Uluslararası Enerji Ajansı (IEA) ve üye ülkeler 1 Mart 2022 ve 1 Nisan 2022 kararları ile kamu stoklarından veya endüstri tarafından tutulan zorunlu stoklardan yaklaşık 182 milyon varil acil durum petrolünü serbest bırakmışlardır. Bazı IEA üyesi ülkeler de ek kamu stoku olarak Mart ve Kasım 2022 arasında 240 milyon varilden fazla petrolü serbest bırakmıştır (IEA, 2023a).

Rusya-Ukrayna savaşıyla birlikte ortaya çıkan enerji krizine karşı AB ülkeleri talep, ikame ve arz yoluyla tepkiler vermişler ve politikalar uygulamışlardır. Bu çalışmanın amacı enerji krizinin enerji talebini nasıl etkilediğini, kullanılan enerji kaynak türleri açısından nasıl bir değişimin yaşandığını ve AB üyesi ülkelerin Covid-19 salgını sonrası artan enerji ihtiyaçlarını karşılamada enerji tedarikçilerindeki değişimi nitel analiz yöntemiyle ortaya koymaktır. Çalışmada Uluslararası Enerji Ajansı, Dünya Bankası ve Avrupa İstatistik Ofisi'nin 2017-2023 dönemi verilerinden yararlanılmıştır. Çalışma Rusya ve AB üyesi ülkeler arasındaki enerji ithalat ve ihracatını kapsamaktadır. Çalışmanın ilk bölümünde AB ülkelerinin toplam enerji ithalatına yer verilmiş, sonrasında AB'nin Rusya'dan enerji ithalatı ile fosil yakıt ithal ettiği tedarikçi ülkeler ele alınmıştır.

## 2. AB Ülkelerinin Toplam Enerji İthalatı (2019-2022)

2022'nin ikinci çeyreğine kıyasla 2023'ün ikinci çeyreğinde AB üyesi devletlerin enerji ürünleri ithalatında düşüş olmuştur. AB enerji ithalatı 2023 yılı ikinci çeyreğinde toplam değer olarak %39.4, net kütle olarak da %11.3 oranında azalmıştır (EU, 2023a).

Şekil 1. AB Enerji Ürünleri İthalat Hacim Endeksi 2021-2023 (2021'in ilk çeyreği = 100)



Kaynak: EU, 2023a.

Şekil 1'de 2021 yılının ilk çeyreğinden bu yana enerji ürünlerinin gelişimi görülmektedir. Petrol yağları ithalatı bu dönemde sabit kalmıştır. Kömür ithalatı da aynı dönemde sabit kalmış, yalnızca 2023 yılının ikinci çeyreğinde ciddi bir düşüş kaydetmiştir.

Petrol yağlarının AB ithalatının toplamı içindeki payı 2021'de %9.1'den 2022'de %11'e yükselmiş, ancak 2023'ün ikinci çeyreğinde %10.2'ye düşmüştür. Enerji bileşimi incelendiğinde (net kütle olarak), petrol yağlarının ithal enerji ürünleri arasında açık ara en büyük grup olduğu (2023'ün ikinci çeyreğinde toplam AB enerji ithalatının %59.5'i) ve %4.8 oranında arttığı görülmektedir (EU, 2023a).

Doğalgaz ithalatı 2022 yılında giderek azalmış, 2022'de %10.8, 2023'ün ikinci çeyreğinde ise %5.9'a düşmüştür. 2023 yılının ikinci çeyreğinde, 2021 yılının ilk çeyreğine göre %25 daha düşük gerçekleşmiştir. 2022 yılı ikinci çeyreği, 2021 yılı birinci çeyrek ile karşılaştırıldığında doğalgazın payı %2.9 azalırken, lng'nin payı %1.1 artmıştır. Lng ithalatı 2021'in ilk çeyreğine kıyasla önemli ölçüde artmış ve iki katına çıkmıştır. Lng'nin artan popülaritesi, taşıma kolaylığı, daha yüksek verimlilik ve diğer enerji kaynaklarına göre daha temiz kullanım gibi bazı faktörlerle açıklanabilir (EU, 2023a).

## 3. AB Ülkelerinin Rusya'dan Enerji İthalatı

Savaşın başlamasından beri AB'nin Rusya'dan enerji ithalatı keskin bir şekilde düşmüştür. Avrupa Birliği verilerine göre 2020 yılında AB enerji ihtiyacının %24.4'ünü Rusya'dan temin ediyordu. AB üyesi ülkeler enerji ihtiyacının %41.7'sini kendileri üretirken, Rusya dışı ülkelerden enerji ithalatının oranı %33.1'di.

AB'nin enerji ithalatı toplam enerji tüketimi içinde %57.5 oranında olup Rusya'dan ithalat toplam ithalat içinde %42 paya sahipti ve AB enerjide Rusya'ya bağımlı durumdaydı (Euronews, 2023).

Rusya'nın boru hattı ve lng yoluyla yaptığı doğalgaz ithalatı, 2021'deki toplam AB doğalgaz tüketiminin %37'sini oluşturmuştur. Rusya'dan petrol ithalatı, AB'nin toplam petrol ithalatının %25'ini oluşturuyordu. Rusya'dan kömür ithalatı ise, 2021'de AB'nin toplam kömür enerji tüketiminin %20'sine katkıda bulunmuştur (BP, 2022: 7).

*Tablo 1. AB'nin Enerji İthalatında (AB dışı) Rusya'nın Ticaretteki Payı*

	2. ve 3. çeyrek ortalaması (2017-2021)	2. ve 3. çeyrek ortalaması (2022)
Doğalgaz	%35.2	%19.9
Petrol	%29.2	%20.0
Kömür	%38.7	%25.7

*Kaynak: EU, 2023b.*

Ocak 2022'de AB'nin Rusya'dan ithal ettiği doğalgaz oranı %41 iken, Ekim 2022'de %12'ye düşmüştür. AB'nin doğalgaz ithalatı savaş öncesi %50 oranındaydı. AB'nin enerji ithalatında Rusya'nın payı ticari olarak da gerilemiştir. 2017-2021 yıllarının ikinci ve üçüncü çeyreğinde AB'nin doğalgaz ithalatında Rusya'nın payı %35.2 iken bu oran 2022'nin aynı döneminde %19.9'a düşmüştür (Euronews, 2023).

*Tablo 2. AB'nin Rusya'dan enerji ithalatı (milyon ton)*

2018	2019	2020	2021	2022 ilk 3 çeyrek	2022 1. çeyrek	2022 2. Çeyrek	2022 3. Çeyrek
319.1	300.2	264	275.6	156.2	65.1	54.5	36.6

*Kaynak: EU, 2023b.*

AB'nin Rusya'dan toplam enerji ithalatı incelendiğinde de ithalattaki düşüş açık bir şekilde görülmektedir (Tablo 2). 2018 yılında 319.1 milyon ton olan enerji ithalatı salgın dönemindeki düşüşten sonra 2021 yılında tekrar yükselerek 275.6 milyon tona çıkmıştır. Savaşın başladığı 2021 yılı 2. çeyreğinde ise 54.5 milyon tona, 2022 yılı 3. çeyreğinde ise 36.6 milyon tona düşmüştür.

#### 4. AB'nin Petrol, Doğalgaz, Lng ve Kömür Tedarikçileri

Dünya petrol ticareti akışı, Rusya'nın enerji ihracatına uygulanan uluslararası ambargoların ortasında büyük bir değişime uğramıştır. Rusya, esas olarak batı limanlarından nakliye yapan, rafineri ve petrokimya hammaddelerinin yanı sıra nihai ürünlerin de önemli bir ihracatçısıdır (IEA, 2023b: 100). Rusya'nın Ukrayna'yı işgalinin ardından G7 hükümetleri ve AB merkezli petrol şirketleri ve tüccarlar, Rus ürünlerinin ithalatını hızla durdurmuş; geri kalan akışlar ise Şubat 2023'te AB ambargosunun yürürlüğe girmesinden sonra durdurulmuştur. AB ambargosu, başta motorin olmak üzere daha fazla Rus hacminin yeni varış noktalarına gitmesine neden olmuştur. İthalatçılar, Rus ürünlerini muhtemelen daha az optimal veya daha maliyetli olan kalite ve menşeli ürünlerle değiştirmişlerdir. Orta Doğu ve Asya'daki rafinerilerden Atlantik Havzası'na daha fazla motorin ve nafta (petrolün 100 ile 250 santigrat derece arasında damıtılmasından elde edilen, benzinle gazağı arasında bir ürün) taşınırken, Latin Amerika ve Meksika'dan Kuzey Amerika ve Avrupa'ya daha fazla

akaryakıt taşınmıştır. Latin Amerika, Orta Doğu ve Asya'da bu hacimlerin yerini Rus ürünleri almıştır (IEA, 2023b: 108).

Tedarikçilerde büyük bir çeşitlilik, 2022 ve 2023'ün sonraki çeyreklerinde giderek ortaya çıkmaya başlamıştır (EU, 2023a). Avrupalı rafineriler, başta ABD ve Orta Doğu olmak üzere yeni tedarikçilerden ham petrol tedarik etmişlerdir. Kuzey Denizi'ndeki yüksek hacimler ise bölgede kalmıştır. Büyük oranda indirimli Rus ham petrolü, özellikle Asya'da yeni alıcılar bulmuştur. Mart 2022'den bu yana Rusya'nın ihracatı tamamen doğuya kaymış, Hindistan ve Çin Rusya'dan ham petrol ithalatını artırmıştır. Mayıs 2023'te Hindistan ve Çin, Rusya'nın ham petrol ihracatının neredeyse %80'ini oluşturmuyordu. Buna karşılık Rusya, Hindistan ve Çin'in ham ithalatının sırasıyla %45 ve %20'sini oluşturmuştur. Rus hacmi Türkiye'ye, Süveyş'in doğusuna, Latin Amerika'ya ve Afrika'ya yönlendirilmiştir. Rusya daha önce Avrupa'da nafta, motorin ve akaryakıtın yanı sıra ABD'de de hammadde ithalatında büyük paya sahipti. Bu pazarlardaki ithalat ikameleri Kuzey Amerika, Orta Doğu ve Asya dahil olmak üzere daha uzak bölgelerden gelmiştir (IEA, 2023b: 101). Petrol yağı açısından, Rus ham petrolünün deniz yoluyla ithalatına ilişkin AB yasağı 5 Aralık 2022'de yürürlüğe girmiş ve ardından 5 Şubat 2023 itibarıyla rafine petrol ürünlerine uygulanan ambargo başlamıştır. Bu önlemlerin etkisi 2023 yılının ilk çeyreğinde görülmeye başlanmıştır (Tablo 3).

Tablo 3. AB'nin Petrol İthalatı (ticaretin payı)

2022 1. çeyrek %		2022 2. çeyrek %		2023 1. çeyrek %		2023 2. çeyrek %	
Rusya	26.09	Diğer	37.5	Norveç	13.3	Diğer	37.4
ABD	10.4	Rusya	15.9	ABD	13.1	Norveç	13.4
Norveç	9.5	ABD	10.8	Kazakistan	10.1	ABD	13.3
Kazakistan	8.5	Norveç	9.6	S. Arabistan	8.2	Kazakistan	10.0
Libya	7.2	Nijerya	6.9	Libya	7.1	Arabistan	8.8
Nijerya	6.4	Kazakistan	6.6	Nijerya	7.0	Libya	7.9
S. Arabistan	4.8	Irak	6.5	Rusya	3.2	Nijerya	6.7
Diğer	27.2	S. Arabistan	6.3	Diğer	38.1	Rusya	2.7

Kaynak: EU, 2023a, EU, 2023b.

2022'nin ilk çeyreğinde Rusya %26 payla en büyük petrol yağı sağlayıcısı olurken, 2023'ün ilk çeyreğinde Rusya'nın payı 2022'nin ilk çeyreğiyle karşılaştırıldığında 22.8 puanlık düşüşle yalnızca %3.2 olmuştur. Buna karşılık aynı dönemde paylarının en fazla arttığı ülkeler Norveç (%3.8), Suudi Arabistan (%3.4) ve ABD (%2.7) olmuştur (IEA, 2023a). AB'nin petrol ürünleri tedarikinde 2022 yılı ilk çeyreğinde %15.9'luk oranla ilk sırada yer alan Rusya'nın payı, 2023 yılının aynı döneminde %2.7'ye inmiştir. İkinci çeyrekte AB'nin petrol ürünleri ithalatında Norveç'in payı %13.7'ye, ABD'nin payı %13.6'ya, Kazakistan'ın payı %10.2'ye ve Suudi Arabistan'ın payı da %9'a yükselmiştir. Rusya'nın ham petrol ihracatı AB ve G7 ülkelerinden Çin, Hindistan ve Türkiye'ye yönlendirilmiştir (World Bank, 2023: 25).

Enerji ithalatındaki düşüş doğalgazda da söz konusu olup Rusya'nın payı 2022 yılı ikinci yarısındaki %28.3 oranından 2023 yılı ikinci çeyreğinde %13.8'e gerilemiştir. AB'nin 2023 yılı 2. çeyreğinde boru hattıyla gaz ithalatında ilk sırayı % 44,3 ile Norveç almıştır (Tablo 4).

Tablo 4. AB'nin Doğalgaz İthalatı (ticaretin payı) (2022 1 ve 2. Çeyrek-2023 1 ve 2. Çeyrek)

2022 1. Çeyrek %		2022 2. Çeyrek %		2023 1. Çeyrek %		2023 2.çeyrek %	
Rusya	38.8	Norveç	38.1	Norveç	46.1	Norveç	44.3
Norveç	38.1	Rusya	28.3	Rusya	17.4	B. Krallık	17.8
B. Krallık	8.9	B. Krallık	17.9	Cezayir	13.4	Cezayir	16.5
Cezayir	6.0	Cezayir	7.2	B. Krallık	12.9	Rusya	13.8
Azerbaycan	6.0	Azerbaycan	6.6	Azerbaycan	7.2	Azerbaycan	6.0
Diğer	2.2	Diğer	2.0	Diğer	3.1	Diğer	1.6

Kaynak: EU, 2023a, EU, 2023b.

AB ülkelerinin Rusya'dan doğalgaz ithalatı 2022 yılı ilk çeyreğinde toplam doğalgaz ithalatının %38.8 'i iken bu oran giderek azalmış, 2023 yılı ikinci çeyreğinde %13.8'e kadar düşmüştür. 2022 yılı ilk çeyreğinde AB'nin en büyük tedarikçisiydi. 2022 yılı ikinci çeyrekte Birleşik Krallık, Cezayir ve Azerbaycan'ın payı artmıştır. 2023 yılı ilk çeyreğinde Norveç, Cezayir ve Azerbaycan doğalgaz ithalatında payı en fazla artan ülkeler olmuştur. AB, doğalgaz ithalatında başka tedarik kaynaklarına yönelerek kaybedilen Rus boru hattı gazını, lng ithalatı ve Norveç ile Kuzey Afrika'dan daha yüksek boru hattı gazıyla değiştirmiştir (World Bank, 2023: 2). lng'de Rusya (%18.1), 2022 yılının ilk çeyreğinde ABD'nin (%48.6) ardından AB'nin ikinci büyük tedarikçisi olmuştur (Tablo 5).

Tablo 5. AB'nin lng İthalatı (ticaretin payı)

2022 1. Çeyrek %		2022 2. Çeyrek %		2023 1. Çeyrek %		2023 2.çeyrek %	
ABD	48.6	ABD	49.1	ABD	48.6	ABD	49.1
Rusya	18.1	Rusya	15.2	Rusya	18.1	Rusya	15.2
Katar	10.7	Katar	11.9	Katar	10.7	Katar	11.9
Nijerya	6.3	Cezayir	4.7	Nijerya	6.3	Cezayir	4.7
Cezayir	4.3	Mısır	4.5	Cezayir	4.3	Mısır	4.5
Mısır	3.1	Nijerya	4.1	Mısır	3.1	Nijerya	4.1

Kaynak: EU, 2023a, EU, 2023b.

2023 yılının ilk çeyreğinde Rusya'nın payı düşmüştür. Aynı zamanda Norveç (%6.5), Katar ve Cezayir'in (her ikisi de %2.4) payları artarken, ABD'nin payı %8.4 düşmüştür. AB'nin 2023 yılı 2. çeyreğinde lng ithalatında da ilk sırayı %46.4'le ABD alırken, onu en yakın %12.4'le Rusya, %10.9'la Katar, % 9.9'la Cezayir ve %5.1'le Nijerya takip etmiştir. Rusya'dan enerji ithalatındaki düşüş kömür için de geçerlidir. 10 Ağustos 2022'de AB ambargosunun yürürlüğe girmesi ve Rusya'dan kömür ithalatına yasak getirilmesinin ardından AB, tedarikini başka yerlerden, özellikle Avustralya, ABD, Kolombiya ve Güney Afrika'dan sağlama konusunda başarılı olmuştur (World Bank, 2023: 31-32). 2022 yılı ikinci çeyreğinde AB kömür ithalatının %32.8'si Rusya'dan yapılmıştı. 2023 ikinci çeyreğinde ise 2022 yılı ikinci çeyreğine göre Avustralya'nın payı %20.5'ten %35.2'ye, ABD'nin payı %20.3'ten %25.9'a, Kolombiya'nın payı %10.9'dan %12.6'ya, Güney Afrika'nın payı %6.6'dan %9.4'e, Kanada'nın payı %2.8'den %4.7'ye yükselmiştir (EU, 2023a, EU, 2023b).

Krize karşı piyasaların tepkisi talebin azalması, ikame etkisi ve arz tepkisi şeklinde olmuştur (Kavukçu, 2022: 5). Rus gazının kesilmesiyle beraber ortaya çıkan açığın giderilmesi için ülkeler lng ithalatına ve alternatif tedarikçilere yönelmişlerdir. Avrupa'nın lng ithalatı %70 oranında artmıştır (Kavukçu, 2022: 1). Uzun vadede toplam tüketim içerisinde fosil yakıtların oranının azaltılması için yenilenebilir enerji kaynaklarının artırılması

yönünde planlama yapılmaktadır (Özdemir Daşcıoğlu, 2022: 4). Ülkeler acil programlar ile yenilenebilir enerjiye geçişlerini hızlandırmaya çalışmaktadırlar. Bunun yanı sıra elektrikli araçların sayısı artmış olup 2019 yılında satılan arabaların %4'ü elektrikli iken 2022'de bu oran %15'e yükselmiştir. 2030 yılında ise dünyanın en büyük üç piyasasında elektrikli araç oranının %50'yi bulması beklenmektedir. Ayrıca dünyada nükleer enerjiye bir dönüş söz konusudur. Yenilenebilir enerjinin itici gücü enerji güvenliğidir. Birçok ülke temiz enerji teknolojisi imalatında güçlü bir role sahip olmayı hedeflediği için bu alanda yatırım yapmaktadır. Bu şekilde enerji maliyetlerinin düşmesi beklenmektedir. Başta ABD olmak üzere özellikle gelişmiş ülkeler yenilenebilir enerji yatırımı yapan firmalara sübvansiyonlar vermekte, vergi muafiyeti sağlamaktadır (EkoIQ, 2022).

Artan enerji güvenliği kaygılarının etkisi, AB'nin daha önce Rusya'dan doğalgaz ithalatına bağımlılığı ve genel olarak petrol ve gaz ithalatına olan yoğun bağımlılığı göz önüne alındığında özellikle belirgindir. AB, Çin ve Hindistan birlikte 2021 yılında küresel petrol ithalatının yaklaşık %45'ini ve doğalgaz ithalatının yaklaşık %50'sini oluşturdu. Her üç bölgede de artan enerji güvenliği endişeleri, ithal edilen petrol ve gazın birincil enerji içindeki payının kalıcı olarak azalmasına yol açmaktadır. Bu ülke ve bölgelerde yerli petrol ve doğalgaz üretiminin artmasında sınırlılık ithal petrol ve gazın birincil enerjideki azalan payının, yurt içinde üretilen yenilenebilir enerji kaynaklarının daha fazla tüketilmesiyle dengelendiği anlamına gelmektedir (BP, 2023: 29).

Rusya'nın Ukrayna'yı işgaliyle tetiklenen küresel gaz ve enerji krizi, dünyaya enerji arz güvenliğinin önemini bir kez daha hatırlatmış ve bunu yaparken fosil yakıt ithalatına bağımlılıktan kaynaklanan kırılganlıkları azaltırken temiz enerjiye geçişin hızlandırılması ihtiyacını da vurgulamıştır. Avrupa Komisyonu, Mayıs 2022'de Avrupa Birliği'nde, yeşil geçişi daha da hızlandırma ve bloğun Rusya'nın fosil yakıt ithalatına bağımlılığını azaltma vizyonunu ortaya koyan REPowerEU Planını yayınlamıştır. REPowerEU ile düşük emisyonlu gazlardan biyometan üretiminin 2030 yılına kadar yılda 35 milyar m<sup>3</sup>'e çıkarılarak on kattan fazla artırılması planlanmaktadır. Düşük emisyonlu hidrojen arzının da 2030 yılına kadar 20 milyon tona çıkarılması ve bu miktarın yarısının çeşitli kaynaklardan ithal edilmesi planlanmaktadır. Birçok Avrupa ülkesi 2022'de hidrojen stratejilerini ve yol haritalarını açıklamıştır (IEA, 2022: 54-55). Küresel biyometan arzı 2022 yılında %16 artmıştır. Artan biyometan üretiminin %90'ını 2019 yılından beri dünyanın en büyük biyometan üreten ülkesi olmayı sürdüren ABD oluşturmaktadır. 2022'de AB biyometan üretimi de %15 oranında artmıştır (IEA, 2022: 57).

## **5. Sonuç**

Covid-19 sürecinde azalan küresel üretim ve enerji talebi, salgından sonra hızla artmaya başlamış, ardından Rusya ile AB ülkeleri arasındaki enerji ticareti yaptırımları, Rusya'nın Ukrayna'yı işgali ve iki ülke arasındaki savaş bir enerji krizine dönüşmüş, krizden tüm dünya etkilenmiştir. Krize karşı enerji piyasalarının ve politikaların tepkisi talep, ikame ve arz tepkileri şeklinde olmuştur. Arz yönünde, AB ülkelerinde enerji ihtiyaçlarının karşılanabilmesi için azaltılması planlanan kömür tüketimine devam edilmesi, kapatılması planlanan santrallerin kapatılmasının ertelenmesi, yeni nükleer santraller kurulması yönünde kararlar alınmıştır.

AB ülkelerinin ithal ettiği enerjinin bileşiminde doğalgaz azalmış, yerine lng ithalatı artmıştır. Savaştan önce enerji ithalatında Rusya'ya bağımlı olan AB ülkeleri Rusya'dan tüm fosil yakıt kaynakları ithalatını azaltmış, başka tedarik kaynaklarına yönelmiştir. 2022 yılı ilk çeyreğinde lng ithalatında %18.1 olan Rusya'nın payı, 2023 yılı ikinci çeyreğinde %12.4 olarak gerçekleşmiştir. En fazla lng ithalatı ABD'den, ikinci sırada Rusya'dan, üçüncü sırada Katar'dan yapılmıştır.

Doğalgaz ithalatında 2022 yılı ilk çeyreğinde %38.8 olan Rusya'nın payı, 2023 yılı ikinci çeyreğinde %13.8 olmuştur. AB'nin doğalgaz ithalatının arttığı ülkeler ise Norveç, Birleşik Krallık ve Cezayir olmuştur. AB'nin petrol ithalatında Rusya'nın payı 2022 yılı ilk çeyreğinde %26.09 iken ikinci çeyreğinde %15.9'a, 2023 yılı birinci çeyreğinde %3.2'ye, ikinci çeyreğinde ise %2.7'ye kadar düşmüştür. Aynı dönemde Norveç, ABD ve Kazakistan'ın payları artmıştır.

Rusya'dan enerji ithalatındaki düşüş kömür için de geçerlidir. AB, kömür tedarikini Rusya yerine, Avustralya, ABD, Kolombiya ve Güney Afrika'dan gerçekleştirmiştir. Rusya-Ukrayna savaşı ve enerji krizi enerjide bağımlılığın azaltılması, yenilenebilir enerjiye geçişin hızlandırılması çabalarının önemini bir kez daha hatırlatmıştır.

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## **| ABSTRACTS & PROCEEDINGS |**

14. International Conference on Political Economy

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## Modern "Hybrid Conflicts" and the Features of Information Warfare

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### **Abstract**

*In these times, contemporary information and technological progressive have allowed states to gain limitless access to information, enabling them to further strengthen their positions and freely manage the information space. The information war has limited military confrontations, despite the fact, it softened sharp confrontations between the countries. Privacy, freedom of expression is exactly those constitutional right that most represent the forms of democracy. As for the freed, it is mirroring in the charter of democracies. The threat of information war is related with the defects of many political systems. The consequence that can arise in conditions of information war, propaganda, and disinformation, can cause serious harm to any country. Thus, it is clear that each stakeholder is answerable for participating in the fight against information warfare.*

*Keywords: Information Warfare, Propaganda, Disinformation, Polarization; Military Intervention; Liberal Democracy.*

### **1. Introduction**

A lot states have successfully switched to liberal democracies after World War II. In 1989, Francis Fukuyama wrote about the "unequivocal victory of political liberalism" and the "universalization of Western liberal democracy as the ultimate form of human government" (Fukuyama, 1989). Free word is especially revered in the United States Of America, which has adopted the least restrictive laws. The inhabitants of the United States protect their right to privacy, and freedom of speech, also from government interference. So, the privacy policy is strictly adhered to in Western European countries also.

Information warfare is the firstborn of the modern global world. Now, access to information is increased, giving and receiving information in a modern environment, 24 hours a day, is freely available to any person, regardless of social status, age or education. The effectiveness of the information war has been revealed by several global events that have popularized its phenomenon (EUvsDISINFO, 2020).

Democratic values such as freedom of speech, expression, and information are under great pressure in the context of modern information warfare. IN modern life everyone and especially countries around the world are actively using disinformation and propaganda for their aims. So Information warfare is as damaging as military intervention.

The paper is based on systematic and complex approaches, it uses certain research methods proven in the social sciences, such as the comparative analysis method and others.

## **2. "Hybrid Conflicts" and Cyberspace**

In our century are a lot conflicts, where information warfare plays an important role, where cyberspace is effectively used to achieve the desired aim. Information warfare is an integral part of hybrid warfare. We still not universal definition of it, so, we must recognize that hybrid warfare, along with military intervention, implies the use of other, more modern tactics in modern conflicts (Fridman, Pearce, 2019). Cyber security is one of the components of information security, around which the debate is becoming increasingly relevant for states. Nowadays, countries, along with military intervention, are actively resorting to information warfare, propaganda, and disinformation/infodemia. It is necessary to note that the ability to share information over the last century, as well as the availability of its means of dissemination, has been growing steadily. If the number of radio listeners in the world after 38 years of the invention of the human radio reached 50 million, this result can be achieved for television in 13 years, and the number of Internet users on the global network has reached the same rate in just 4 years since its invention (Chkopoia, 2017). At the same time, the formation of the global information space, which gave a great motive to the progress of mankind, revealed its negative aspects.

"Cybercrime" is not just a word today, it poses the greatest threat to humanity. Almost every day, the media of different states report about this terrible event in the world. For example, in 2011 a group of hackers hacked the website of the American analytical research company Strategic Forecasting. Consequence, e-mail addresses were published on the Internet, with passwords for US and British servicemen, intelligence agents, police officers, as well as NATO advisers and politicians. Additionally, the personal data of former Secretary of State Henry Kissinger and former US Vice President Dan Quayle, who worked during the presidency of President George W. Bush, became available. Thus, it is worthy to recall a group of hackers, Team Poissn, who hacked into one of the UN servers, stealing the passwords of thousands of employee accounts. The victims of cyber-attacks are not only high-ranking officials but also ordinary citizens (Krepinevich, 2012). In 2012, criminals in Israel hacked and published the personal data of several thousand credit card holders. It should be highlighted that cyber-attacks are not limited to attacks on individuals, they also occur at the state and international levels. This is because the national infrastructure of each modern state is closely linked to the use of the latest computer technology (Dawson, 2020).

The use of computer systems and the Internet has a special place in the work of many countries and organizations, therefore the interruption of their work or any kind of damage seriously affects any process carried out by the organization, or government agency. Internet and computer systems are used to manage various infrastructures. Any damage or malfunction to military and satellite systems, communication channels, elements of water, gas, electricity and nuclear energy, oil and refining infrastructure can cause serious harm to both the company and the state.

From 2007-2012, there were numerous cases where the critical, important infrastructure of different countries and companies was intentionally damaged using the Internet and computer viruses. 2007 - Russia's confrontation with Estonia escalates into a serious cyber-attack, causing certain problems for the Estonian Internet space. Estonian internet resources were inaccessible for some time, and Estonian websites were damaged. Government websites, as well as websites owned by news agencies, were deliberately hacked and damaged. To restore the functioning of some state sites, temporary copies of them were created in the American and European Internet space. During the 2008 Russia-Georgia war, Georgia's Internet space was exposed to serious cyber-attacks. A large number of network packets were sent to the Georgian Internet space, which caused the overloading of Internet channels and temporary damage to the Georgian Internet space (Geers,

2008). GeorBot - Targeted cyber espionage against Georgian state resources during 2011-2012. The hackers infected only those pages of Georgian news sites that contained information about the visits of the NATO delegation, military news, the president's statements, and relations with the United States. Thus we can say that the target audience was pre-selected by the cyber-attack organizers. When opening these websites, the Internet user's computer was automatically infected with an unknown virus program. The virus checked the geographical location of the computer by time zone. The main function - was to search for predefined words in military files, and documents (military, secret, intelligence), in case of detection, these files were copied to the author's server and infected many government agencies and several critical infrastructure objects. Flame / Gauss - A high-level cyber-attack on Arab states in 2012, specially created computer viruses infected the agencies of the target countries ([Fisher](#), 2012).

One of the main problems in the fight against cybercrime is the fact that it is often very difficult to pinpoint not only the direct perpetrators but also their location or the country from which the attack took place. Therefore, an offender or a group of criminals can easily hide not only their involvement in organizing a cyber-attack, but also identify themselves as other users of the network or remain anonymous altogether. The sources of cyber threats are representatives of the public and private sectors, as well as organizations and individuals created under different types and brands. The paradox is that the most decentralized structure (the Internet), whose original purpose was to deter the threat of a Soviet nuclear attack by US security services at the time, gives the parties involved in modern conflicts after the end of the Cold War the opportunity for a variety of actions (Hearing Held, 2017).

### 3.The Difficulty of Specifying the Definition

Still, Kennedy called the Internet a new public square, but we must acknowledge the importance of the unique features of social media, which contributes to the distortion of free speech and creates a favorable information environment for the enemy. The Internet has created a modern environment in which the most important problem is technological insecurity. Social networks have helped increase the personal impact of each individual on information, in terms of persuasion around the world. Propaganda goes even further than the truth. In this case, we have to refer to the term fake news, which was first used in the late nineteenth century, but its definition does not allow to define the essence of misinformation, as this definition itself is vague and ambiguous, and experts want to develop its exact terminology, as many consider fake news an inadequate term. Here even the politicians are not the exception, since very often they use this term to refuse to cover information that is unacceptable to them.

Misinformation confuses the citizens, strengthens their distrust, and manipulates public opinion. Thus, social media has promoted polarization and strengthened the interference of external forces in the domestic politics of countries (Transparency International Georgia, 2019). Here we have to say that the concept of disinformation or infodemia for the EU relates to unverified, misleading information used as a weapon for economic and political gain that could lead to public harm. It also threatens democratic, political processes.

### 4,The Kremlin Information War against Democracy in the West and the United States

The modern world is well aware of Russia's targeted information war campaigns against Estonia, Ukraine, Georgia, Western Europe, and the United States. According to the US Department of Justice, the purpose of Russia's actions is to introduce a rift, undermine trust in democratic institutions and influence the political mood, thus trying to achieve its own geopolitical goals (Colomina, Sanchez, Youngs, 2021).

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Before the 2016 US presidential election, Russia actively used the media to spread fake news and sources among key groups of voters. To prevent this, the US State Department began developing and implementing a new program aimed at using counter-arguments and identifying the actors. However, the State Department was forced to cancel the program because the United States Privacy Act of 1974 restricted the collection of data, and the program allowed free access to personal information, which was against the law (Colomina, Sanchez, Youngs, 2021).

To fight the information war, the US must reconsider the laws, amend them, and implement legislative reforms to protect national security and ensure democratic processes, and civil liberties. Laws in the United States at this point create serious obstacles to the fight against information warfare, the latter of which undermines liberal democracy.

### **5.Information War in the Context of the COVID-19 Pandemic**

China and Iran are actively involved in the modern information war with Russia, which has become particularly strong under the Covid-19 pandemic and spreads similar narratives. During the COVID-19 pandemic, the capabilities of information warfare were further "refined". As for the propaganda, information warfare has further fueled the talk of conspiracy theories, which has led to a distrust of public institutions, even in democracies. In the conditions of the modern pandemic, the tendencies of foreign interference in the domestic policy increased, which was facilitated by technological possibilities, which led to the formation of public opinion and the formation of different views, which often contradicted the interests of the state. These developments have forced the EU to counter growing threats and focus more on foreign policy (Chkopoia, 2021).

According to the World Health Organization (WHO), the world community has become a victim of an infodemic around the COVID-19 pandemic (Alaverdov, 2021). Between January 20 and February 10, 2020, 2 million messages were posted on Twitter related to theories about the coronavirus pandemic a vulnerability syndrome that emerged in the community. The abundance of infomedia deprives people of the opportunity to seek a credible source. At least 17 countries have adopted regulations aimed at reducing disinformation in a pandemic, which includes the imposition of certain censorship (Freedom of Information Development Institute, 2016).

United Nations Secretary-General Antonio Guterres has presented a set of actions that ensure the protection of human rights and at the same time direct the spread of misinformation. The UN is actively working to stop the disinformation campaign in the face of the whole pandemic, which threatens world stability. The World Health Organization (WHO) actively cooperates with social networks, including WhatsApp, Facebook, and other platforms, to give the public access to accurate information related to the pandemic (Shubitidze, 2021).

In April 2020, the EEAS (European External Action Service) released a report addressing threats from Russia and China, such as conspiracy theories and disinformation threatening democratic values in modern society. Disinformation campaigns also include marketing strategies that use personal data to divide people into small groups. Propaganda is used as an instrument to control information and to reduce public opinion and freedom of the press. Information warfare limits the international community's ability to separate the real from the fictional story, with particular damage to democracy, and the national and individual security of citizens (Colomina, Sanchez, Youngs, 2021).

## 6. Information Warfare and Human Rights

Disinformation violates human rights, has a significant impact on freedom of expression, violates privacy policies, undermines the quality of democracy, trusts in democratic institutions, threatens the objectivity of electoral processes, and polarizes the Internet, affecting not only economic but also political and economic issues. The question is, how can the use of misinformation harm a person? Has the following answer, that is possible by harming the reputation of the individual, the individual within the target audience, which violates fundamental human rights (Magaladze, 2021). The target of the information war is democratic institutions, followed by a weakening of public confidence. This issue has become very relevant for international organizations in recent years. The Parliamentary Assembly of the Council of Europe (PACE) expressed concern about the scale of the information war and said that noting that disinformation campaigns have intensified, aimed at information pollution in a digital and increasingly polarized world, influencing public opinion and increasing foreign interference (Colomina, Sanchez, Youngs, 2021).

Misinformation threatens and restricts basic human rights, although the fight against it in some states has led to a reduction in freedom of expression and the pursuit of dissent, which is a more serious problem. Both inside and outside the EU, you need to be careful when taking measures (state censorship or restrictions on social media) to combat misinformation, both in European countries and in the US. Any legal, political, administrative, or illegal activity that has the potential to undermine the fundamental rights of expression, of association, of human beings will ultimately lead to the disruption of democratic processes, to erosion.

The EU's goal is to strengthen human rights capacities, promote democracy, and ensure justice, not only in the EU Member States but also in the world. The EU has cut off funding and trade benefits to countries that are experiencing democratic setbacks and have human rights problems. The state of Taiwan, which is considered a leader in the digital field, has developed a strategy focused on citizen participation, which increases the degree of legitimacy of democracy (Mshvidobadze, 2020). The Canadian government obliges companies to increase the degree of transparency, even around political issues, including in the run-up to elections.

## 7. Conclusion

While countries that exemplify advanced democracies (Taiwan, South Korea, Canada) may not need the support of the European Union or the United States, the fact that information warfare is a global problem and requires team work and a common struggle cannot be disregarded. And those countries where public authority violates human rights within the framework of legitimate power need the help of the EU, in this reality, the EU will have to put some leverage in order not to restrict human rights, not weaken the development of democratic institutions, citizens have guarantees of expression. It still hard to fight against informational war initiatives that will promote and contextualize disinformation, as well as strong support for media pluralism it is important to respond quickly to misinformation so that it does not rise to dangerous levels, leading to global catastrophe. To overcome this problem, it is necessary to produce a global dialogue.

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## Circular Economy in Kosovo and OECD Policies as a Model

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### **Abstract**

*Nowadays, countries are shifting from linear economy to circular economy to increase economic growth and environmental protection. This shifting requires financial funds and wide awareness for benefits of environmental protection and represents a challenge for countries in transition. In this case, a strategy for developing countries could have been the following of the policies implemented by developed countries. This paper studies the opportunities, challenges, and benefits of the circular economy in Kosovo. The methodology applied in this paper includes the summary of findings and publications from the country's institutions, international organizations, and other authors. Kosovo has so far taken several steps in the implementation of the circular economy in the country through the issuance of laws, international agreements, and projects by international organizations. However, there is still work to be performed before the implementation and full extraction of the significant benefits that the circular economy can bring. Three econometric models for the implementation of the circular economy from OECD countries are also included in the paper for comparison, in order to suggest political models which could be followed by Kosovo and other developing countries.*

*Keywords: Linear economy, Circular economy, Economic growth, Environmental protection*

### **1. Introduction and Literature Review**

The concept of Circular Economy (CE) is gaining momentum, particularly in the European Union, as it advocates for the responsible and cyclical utilization of resources to foster sustainable development. CE is a broad notion encompassing various interpretations. Despite its lack of clarity, efforts have been made to transform it into actionable plans with the backing of specific indicators. These indicators concentrate on material preservation through strategies like recycling. It is recommended to employ a range of indicators when evaluating CE instead of relying on a solitary one (Moraga et al., 2019). The transition from a linear economy to a circular economy is a challenging endeavor for most organizations and businesses. However, there is a growing trend towards adopting a circular economy as society becomes increasingly aware of the negative ecological impacts of the linear model on future generations (Patwa et al., 2021). Achieving this transition requires the active participation of various stakeholders, including consumers, businesses, non-governmental organizations, and governments. Extending the lifespan of products through practices such as reduce, reuse, and recycle (3R) is crucial in the shift towards a circular economy, as it aims to prevent resource waste. The overarching goal of the circular economy is to achieve ecological balance and protection. Concepts like Waste to Energy, renewable energy utilization, and efficient resource management contribute to waste reduction, leading to increased economic efficiency and promoting the circular economy. Governments play a pivotal role in driving the adoption of circular economy principles, particularly in emerging economies. Encouraging behavioral change through effective communication, education, and economic advancement is essential to foster a culture of circular economy within society (Patwa et al., 2021).

Four main components should be included in definition of CE: the recirculation of resources and energy, the minimization of resources demand, and the recovery of value from waste, a multilevel approach, its importance

as a path to achieve sustainable development, and its close relationship with the way society innovates (Sandoval et al., 2017). Most of the current efforts in the field of circular economy focus on the practical and technical aspects concerning the physical movement of materials and energy within production-consumption systems. (Korhonen et al., 2017).

Some organizations are incorporating the principles of the circular economy through practices such as reduction, repair, remanufacturing, and recycling (known as the 4Rs). However, not all of these organizations are fully aware that they are actually implementing circular economy principles. (Gen & Lozano, 2020). The idea of regeneration might not be applicable to the entire economy and could be overlooked as a guiding principle of the circular economy. On the other hand, restoration can be considered a core principle as it has widespread relevance and serves as a reference point for various circular practices (Morseletto, 2020).

The findings of an online survey experiment, which examined customers' willingness to pay for products in a theoretical multi-level Circular Economy, indicate that the average customer generally prefers products with a higher level of circularity compared to identical products without circular attributes. Customers consistently show a willingness to pay more for products that possess low or moderate levels of circular content. However, the analysis suggests that the willingness to pay more diminishes, and in some cases even decreases, as the proportion of recirculated content increases (Boyer et al., 2021). These results provide evidence that labeling products with a numerical circular economy rating at lower levels of recirculated content could be a profitable strategy for manufacturers of mobile phones and robot vacuum cleaners (Boyer et al., 2021). However, the effectiveness of such a strategy becomes less certain for heavily refurbished products, fully reused products, or other types of products (Boyer et al., 2021).

## 2. Regulatory Framework of Circular Economy in Kosovo and its Current Practices

Laws aim to establish regulations and measures for waste management in order to safeguard the environment and human health. They promote recycling, prevent or minimize waste generation and its adverse effects, reduce the overall impact of resource use, and enhance resource efficiency. These efforts are crucial for transitioning to a circular economy and ensuring fair competition. In accordance with the compliance statement of the Republic of Kosovo's legislation with the EU Acquis (2021), the parties involved will collaborate to strengthen environmental cooperation. The primary objective is to halt further environmental degradation and initiate improvements, with a focus on achieving sustainable development in Kosovo. Specifically, the collaboration will involve enhancing the structures and administrative procedures in Kosovo to enable strategic planning of environmental issues and coordination among relevant stakeholders.

With the circular economy gaining traction in Kosovo, it is imperative for small and medium-sized enterprises (SMEs), which constitute the majority of businesses in the economy, to take the lead in transitioning from a linear to a circular economic model.

Environmental policies that target SMEs are not included in Kosovo's Private Sector Development Strategy (2018-2022) but should be covered in the upcoming National Development Strategy. The circular economy should also be boosted with the new Integrated Waste Management Strategy. Nevertheless, only limited progress has been achieved in implementing greening measures since the last assessment due to poor co-ordination between relevant stakeholders and insufficient funds.

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*Table 1. Kosovo's implementation of the Green Policies for SME*

Recommendation	Developments during the assessment period	Progress status
Introduce SME greening measures in the strategic documents and related action plans	The soon-to-be-adopted National Development Strategy should have a specific focus on environmental policy and include elements from the United Nations (UN) Sustainable Development Goals and the European Commission's Green Deal in this regard. Some SME greening measures were also introduced in the Integrated Waste Management Strategy. The SME Development Strategy does not include SME greening measures.	Limited
Focus on raising awareness and providing advice and guidance to SMEs on adopting environmentally sound practices	No actions have been taken in this regard.	No progress
Enhance financial support for SME greening	Some financial support programs funded by international partners are available to SMEs, such as through the recently established Kosovo Credit Guarantee Fund (KCGF). However, the government has not established other financial incentives to encourage SME greening.	Limited

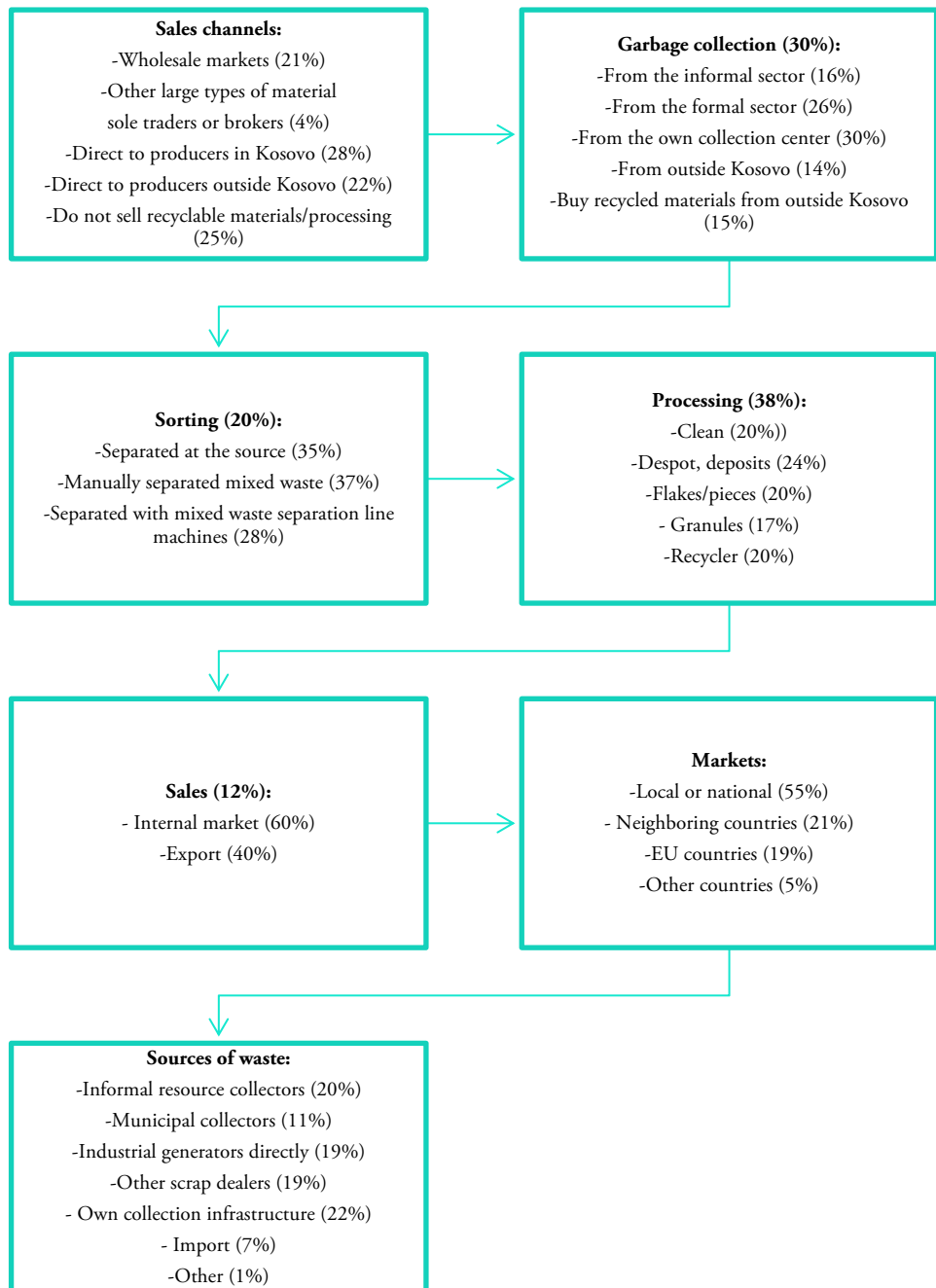
*Source: OECD Publication - SME Policy Index: Western Balkans and Turkey 2021*

The Chamber of Commerce of Kosovo has drawn some important findings for the implementation of the circular economy in Kosovo by investigating 68 companies in the value chain of the recycling sector. Findings are appeared in the following diagram.<sup>2</sup>

<sup>1</sup> OECD Publication: SME Policy Index: Western Balkans and Turkey 2022

<sup>2</sup> Chamber of Commerce of Kosovo: *Analysis of the Recycling Value Chain in Kosovo*

*Figure 1. Statistics of the recycling chain in Kosovo*



*Source: Kosova Chamber of Commerce*

While there is currently no specific policy framework dedicated to the circular economy in Kosovo, the Integrated Waste Management Strategy (2020-2029) and its Action Plan (2020-2022) indirectly address aspects of the circular transition. These documents outline three main objectives: 1) increasing awareness about the importance and benefits of waste management and recycling; 2) fostering innovation to prevent waste generation; and 3) establishing systems for reuse and recycling through extended producer responsibility schemes. However, financial and non-financial incentives for SMEs to support their greening efforts have not specifically focused on the circular economy. The promotion of circular economy concepts has been limited during the assessment period, and there is a lack of visible support or training programs that specifically target sustainable business practices, the social economy, greening, and the circular economy. The extent and depth of available provisions, whether funded by the government or international partners, across all regions of Kosovo cannot be accurately determined.

### 3. Policies to follow

Developed countries represent a model to be followed by developing countries. The aspect of policies undertaken by developed countries should serve as a guide for making policies in developing countries, so that they benefit as much as possible. Since the circular economy is not widely practiced in Kosovo, even the statistical databases are not rich with data for many years, through which we would have been able to derive valuable econometric models.

Considering that developing countries should make efforts to follow developed countries in the implementation of policies, three linear econometric equations for OECD countries have been studied in this paper. The data were obtained for all member countries for the period 2000 - 2020, thus forming Panel data. To test the significance, the Fixed Effects model was used.

Hypotheses have been formulated as follows:

*H<sub>1</sub>. The increase of the environmental tax affects the reduction of waste generation.*

*H<sub>2</sub>. The increase in the Gross Domestic Product affects the increase in waste generation.*

*H<sub>3</sub>. The increase in the price of oil affects the reduction of the environmental tax.*

The data has been processed statistically and the findings of Fixed Effects have resulted as below:

*Table 2. Fixed Effects model*

DV	IV	Empirical equation	Coefficient	Std. error	t	P> t
lnwaste	lnenv	$\ln \text{waste}_{it} = \beta_0 + \beta_1 \ln \text{env}_{it} + \varepsilon$	-0.0766384	0.0261088	-2.94	0.003
lnwaste	lngdpr	$\ln \text{waste}_{it} = \beta_0 + \beta_1 \ln \text{gdp}_{it} + \varepsilon$	0.0136331	0.006148	2.22	0.027
lnenv	lnoil	$\ln \text{env}_{it} = \beta_0 + \beta_1 \ln \text{oil}_{it} + \varepsilon$	-0.0451701	0.0128243	-3.52	0.000

*Source: Statistical data processing by the author*

The first econometric model presupposes the environmental tax variable as independent, and the waste generation variable as dependent. According to the results, the model appears significant with t-statistics  $t = |-2.94| > 2$  and p-value  $0.003 < 0.05$ , in 95% confidence interval. The coefficient is negative, which means that

there is a negative relationship between the environmental tax and waste generation. It is concluded that the first hypothesis is true.

The second econometric model presupposes the waste generation variable as independent, and the GDP change variable as dependent. According to the results, the model appears significant with t-statistics  $t = |-2.22| > 2$  and p-value  $0.027 < 0.05$ , in 95% confidence interval. The coefficient is positive, which means that there is a positive relationship between economic growth and waste generation. It is concluded that the second hypothesis is true.

The third econometric model presupposes the oil price variable as independent, and the environment tax variable as dependent. According to the results, the model appears significant with t-statistics  $t = |-3.52| > 2$  and p-value  $0.000 < 0.05$ , in 95% confidence interval. The coefficient is negative, which means that there is a negative relationship between the level of oil prices and the environmental tax. It is concluded that the third hypothesis is true.

The findings suggest that developing countries should follow environmental tax policies in order to reduce waste generation. It should be considered that the increase in production leads to an increase in waste generation. Also, the increase in the price of oil affects the reduction of the environmental tax.

#### 4. Conclusion

The primary objective of the circular economy (CE) is to minimize the generation of waste and pollution by reintroducing products, materials, and resources back into the production cycle at the end of their lifespan.<sup>1</sup> This approach has significant benefits for public health, as it helps eliminate toxic chemicals through design strategies. By reducing material consumption, we can also mitigate pollution, waste, and associated health impacts, which are crucial for preserving essential ecosystem services and natural resources, including biodiversity. In the linear system, products eventually become waste, with a majority ending up in landfills or being incinerated. For example, on a global scale, approximately 400 million tons of plastic waste and 54 million tons of electronic waste are generated each year. Mishandling of such waste poses risks to both human health and ecosystems. Additionally, as per a World Bank publication on December 2022, it is estimated that more than 90 percent of biodiversity loss can be attributed to the extraction and processing of natural resources.<sup>2</sup> To drive the transformation of the secondary market for renewable sources, it is crucial to implement commercial, policy, and technology interventions. The country should first determine the most effective areas to initiate these interventions. Additionally, fostering a conducive learning environment and creating opportunities for experimentation and private sector initiatives will be essential.<sup>3</sup>

Waste management continues to remain a challenge for institutions in the country. Their collection, transport, recycling, reprocessing, and disposal has an impact on the lives of citizens. If not handled properly they can contaminate the soil, water, and air. While the countries of the European Union and the region recycle and reuse most of the waste, in our country it is deposited without any separation, ending up all in one place. In addition to the fact that the health of citizens can be endangered, they do not even manage to turn into financial

<sup>1</sup> <https://www.google.com/url?sa=D&q=https%3A%2F%2Fwww.eea.europa.eu%2Fpublications%2Fthe-benefits-to-biodiversity>

<sup>2</sup> [Squaring the Circle: Policies from Europe's Circular Economy Transition \(worldbank.org\)](https://www.worldbank.org/publications/circular-economy)

<sup>3</sup> USAID Publication: *Clean energy and the circular economy: Opportunities for increasing the sustainability of renewable energy value chains*

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benefits. As per Office of National Audit Office in Kosova Report published in 2021 the environmental protection is at risk as sanitary landfills and transfer stations continue to lack integrated permits. Issues related to commercial waste management require immediate improvements.<sup>1</sup>

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## Housing Sector and Its Contribution to the Economy: A General Evaluation from the Republic to 2023

### Konut Sektörü ve Ekonomiye Katkısı: Cumhuriyetten 2023'e Genel Bir Değerlendirme

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#### **Abstract**

*The dynamic development of the construction industry in Turkey has played a central role in shaping the country's socio-economic landscape over the past century. From its formative stages during the founding of the Republic to its current state of dynamic growth and innovation, the sector has remained an indomitable force driving Turkey's economic progress, skilfully responding to shifts in the political environment and embracing a range of cutting-edge technological advances along its transformative journey. The housing sector, which often acts as a lever for national economies through the value added and employment opportunities it generates, is of particular importance. The Turkish housing sector, which relies heavily on national capital, has a significant impact on the employment and production process as it involves hundreds of occupational branches. This study evaluates the place of housing policy in economic policies in general from the Republic to 2023.*

*Keywords: Housing Sector, Economy of Housing, Housing Sector in Turkey.*

#### **Giriş**

Türkiye'de inşaat sektörünün dinamik gelişimi, geçtiğimiz yüzyıl boyunca ülkenin sosyo-ekonomik manzarasının şekillenmesinde merkezi bir rol oynamıştır. Cumhuriyetin kuruluşu sırasındaki oluşum aşamalarından günümüzdeki dinamik büyüme ve inovasyon durumuna kadar sektör, Türkiye'nin ekonomik ilerlemesini yönlendiren yılmaz bir güç olmaya devam etmiş, siyasi ortamdaki değişimlere ustalıklı yanıt vermiş ve dönüştürücü yolculuğu boyunca bir dizi üstün teknolojik gelişmeyi benimsemiştir.

Yarattığı katma değer ve istihdam olanaklarıyla ülke ekonomileri için çoğu zaman bir kaldıraç görevini üstlenen konut sektörü ayrı bir öneme sahiptir. Büyük ölçüde ulusal sermayeye dayanan Türkiye Konut Sektörü, yüzlerce meslek dalını ilgilendirmesi nedeniyle istihdam ve üretim sürecini önemli ölçüde etkilemektedir. Ulusal ve uluslararası alanlarda büyük bir deneyime ve potansiyele sahip olan sektör, kendisine bağlı 200'den fazla alt sektörü harekete geçirme özelliğiyle 'lokomotif sektör' ve büyük istihdam kaynağı olması özelliğiyle de 'sünger sektör' olarak adlandırılmaktadır. Genel olarak İnşaat ve içinde önemli bir paya sahip konut sektörüne girdi sağlayan ve faaliyetlerini bu sektördeki gelişmelere bağlı olarak devam ettiren öteki sektörlerin katkısı da dikkate alındığında, GSMH içindeki payının yaklaşık %30 düzeyinde olduğu görülmektedir.

#### **Türkiyede Konut Sektörünün Gelişimi**

Türkiye'de 1980'li yıllardan itibaren ciddi gelişim göstermiş olan Konut Sektörü'nün büyüme eğilimi, 1988 yılından sonra yavaşlamıştır. Artan liberalizasyon süreci ve artan faizlerle yükseliş gösteren yatırım maliyetleri

sonucu, inşaat talebi düşmüştür. 1993-2003 döneminde Türkiye Ekonomisi %26,13 oranında büyürken, İnşaat, Kamu İnşaat Sektörü'ndeki yatırımların azalması sonucu ana sektörler arasında küçülen tek sektör olarak %22,4 oranında daralma göstermiştir. Konut Sektörü, 2004 yılından itibaren ise canlanmaya başlamış, 2020'in ilk yarısında inşaat ruhsatlarındaki artış oranı, bir önceki yılın aynı dönemine kıyasla %38 olmuştur.

İnşaat sektörü, 20. yüzyılın ortalarındaki hızlı kentleşmenin ortasında, artan konut talebine büyük ölçekli toplu konut projelerine öncülük ederek yanıt vermiştir. Özellikle 1950'lerde bir milyondan fazla konutun inşa edilmesi, sektörün artan nüfusun acil ihtiyaçlarını karşılamadaki önemli rolünün altını çizmiş ve toplumsal refah ve kentsel ilerleme ile ayrılmaz bağlantısını göstermiştir (Kıvrak ve Ulubeyli, 2019).

Hükümetin 2023 için 173,1 milyar Türk liralık (T.C. Maliye Bakanlığı, 2023) önemli bir bütçe tahsisi yoluyla sektörün büyümesini ve gelişmesini teşvik etme konusundaki desteğini ve Türkiye'nin genel ekonomik gidişatını yönlendirmedeki araçsal rolünü artırmasının bir kanıtı niteliğindedir.

Cumhuriyetin kuruluş yılları, sınırlı ekonomik kaynaklara sahip olunan ve yeni başkentin kuruluşunun önemli olduğu yıllardır. Yeni devlet, yeni bir başkent, yeni çalışanlar, nihayetinde yeni kamu binaları, yeni konut ihtiyacı anlamına gelmiştir. Ayrıca, Ankara için üretilen şehir planları, konut planları, Türkiye geneli için şablon olarak kullanılmıştır. Ancak Ankara'nın nüfus artış hızının doğru tahmin edilememesi (bu da konut ihtiyacının planlı olarak karşılanmasına izin vermemiştir) ve düşük gelir düzeyinden kaynaklanan finansman sorunları yeni konutların yapılabilirliğini ve ulaşılabilirliğini azaltmıştır.

### **Kamunun Konut Üretimine Katılması**

Cumhuriyetle beraber birey / hanehalkı gelirlerin düşüklüğü ya da bu gelirlere göre konut fiyatlarının yüksekliği ciddi bir finansman sorunu yaratmıştır. Hükümetler zaman zaman üretim maliyetlerini düşürerek ve/veya alım gücünü destekleyebilecek kamu düzenlemeleri yaparak çözmeye çalışmıştır.

Cumhuriyetin kurulmasına koşut olarak ülkenin siyasal ve ekonomik açıdan yeniden inşasına girilmiştir. 1930'lu yılların sonuna kadar siyaset, hukuk, eğitim ve kültür alanlarında önemli dönüşümler gerçekleştirilerek kapitalizmin gelişmesinin önündeki engeller kaldırılmaya çalışılmıştır. Ancak, dönüşüm daha çok kent toplumu ile sınırlı kalmış, kırsal nüfusun yaşamında belirgin sonuçlar doğurmamıştır. Buna, tarım sorununun çözülmediği gerçeğini de eklemek gerekir. 1930'lardaki devletçilik hamlesi ile sanayi kapitalizminin temelleri atılmış olsa da, bir sanayi burjuvazisinin oluşmaya başlaması için 1950'li yılları beklemek gerekecektir (Savran, 1992: 51-56, 90).

Yeni devletin kurumsal örgütlenmesinin gelişimiyle birlikte özellikle Ankara'da sayıları artan memurların konut gereksinimlerinin karşılanması için yapılan düzenlemelerdir. 1925 yılında çıkarılan bir yasa, memurlara, konut kooperatifleri kurmaları için aylıklarının yarısı kadar avans verilmesine olanak tanımıştır. 1928 yılında çıkarılan başka bir yasa ile Maliye Bakanlığı'na Hazine olanaklarıyla memur konutları yaptırma yetkisi tanınmış olsa da, uygulamaya geçirilmemiştir. Bunun yerine, 1929 tarihli bir yasayla, memurlara konut tazminatı ödenmesi uygulaması başlatılmış ve 1951 yılına kadar sürdürülmüştür (Keleş, 2010: 445). Memurlar için konut yapılması konusu 1944 tarihli Memur Meskenleri İnşası Hakkında Kanun ile düzenlenmiştir. Ankara, cumhuriyetin, gelişmesi bir plana bağlı olan ilk kentidir. 1928 yılında çıkarılan bir yasa ile Ankara Kenti İmar Müdürlüğü kurulmuştur. Jansen Planı olarak anılan imar planı 1932 yılında onaylanarak uygulamaya konulmuştur. Planın ve imar işlerinden sorumlu birimin varlığına karşın, konut maliyetleri içinde önemli bir yer tutan arsa spekülasyonu ise o dönemin Ankara'sında da engellenmemiştir (Yavuz, 1952: 15-69).

## **TOKİ ve Kooperatiflerin Konut Yapımı**

Tarımda traktör kullanımının artması emekçinin kırdan kopmasına yol açan bir unsur iken, hem sanayileşme hem de işçi ve memur kesimlerinin ücretlerindeki reel iyileşme, kentleri, kırdaki emekçiler için bir çekim merkezi haline getirmiştir. Belediyenin desteklediği yapı kooperatifleri modeliyle konut üretiminde önemli bir deneyim olarak Ankara Belediyesi öncülüğünde Batıkent projesi kooperatif biçiminde örgütlenmenin ilklerindendir.

TOKİ ile Kentsel dönüşümün ilk örnekleri sayılabilecek projeler, 1990'lı yılların başında Ankara'da uygulamaya konmuştur. Ankara'da uygulanan üç ayrı projede, kentsel dönüşüm sürecinde inşa edilen konutlar 80-90 metre karelik apartman daireleridir.

Konutun başka bir nesneyle ikame edilememesi, konut piyasasına diğer piyasalardan farklı bir nitelik kazandırmaktadır. Türkiye'de konut politikaları mülk konutu desteklemiş ve kiralık ko-nut sunumuna yönelik etkin bir politika geliştirememiştir. Ankara'da konut sektörü piyasa koşulları çerçevesinde gelişmiştir.

Türkiye'de halen kurumsallaşmış bir konut finansman sistemi oluşturulamamıştır. Kırk yıllık planlı dönemde her plan içerisinde, kamuya ek yük getirmeyen uygun finansman modelleri geliştirilmesi üzerinde durulmuş, arayışlar ve uygulamalar birbirini izlemiştir. Ancak, hiç bir uygulama, kesintisiz ve kalıcı hale gelememiştir .

Konut sorununun, kapitalist ekonomide piyasa düzeniğinin ve metalaşma sürecinin bir sonucu olarak belirdiği, devletin ise bu alana ancak yeniden üretici biçimde müdahale ettiği gözlenmiştir. Ankara bu durumu tipik ama yeterli olmayan bir örneğidir adeta. 1950'lerin arayışı, 1980'lerin yeni dünya düzenine eklemleme kararlılığı ile birleşince, konut, bir meta ve rant alanı olarak, hanelerin birikim aracı olarak ve ekonomik bunalım dönemlerinde devletin çıkışı kapısı olarak başvuru alan bir sektör halini almış; özelleştirme adı altında küçültülmeye çalışılan, üretim alanından çekilen devlet, 1980 sonrasında, güçlü bir konut üreticisi haline gelmiştir. TOKİ ve Emlak Bankası'nın konut üretimi, ulusal kaynakları lüks ve pahalı konutlara, efektif talep gücü yüksek kümelerle yönelmiştir. Devlet, ekonomiyi canlandırmak adına, konut ve kentsel arsa alanında işletmeciyi mantığı ile kar peşinde koşarken, dar gelirli kesimin konut gereksinimi, kooperatiflerin inisiyatifine bırakılmış, ancak, kooperatif hareketi güçlendirecek ya da etkin duruma getirecek düzenlemeler yapılmamıştır (Aydın, 2003).

## **Sonuç Yerine**

Ekonomik ve sosyal çevre üzerinde etkili bir unsur olan özelde konut genelde inşaat sektörü; GSMH ve milli gelir içindeki payı, diğer sektörlerle olan girdi-çıkışı ilişkisi ve geniş istihdam alanları sağlaması nedeniyle ülke ekonomisinde önemli bir yer tutmaktadır. Konut sektörünün GSYH, sanayi, hizmetler ve tarım sektörleri üzerinde kısa ve uzun dönem etkileri bulunmaktadır. Son yirmi yılla yakın süre içinde Türkiye'de ekonominin itici gücünün inşaat ve konut kesimlerindeki yatırımların pompalanması olmasına özen gösterilmektedir. Hazine'nin sahip bulunduğu arsa ve arazilerin bile özelleştirilerek bu kesimlerin aktörlerine kaynak aktarılması aamacıyla kullanılması, geçici süreler için ekonomide canlılık yaratmaya yarayabilir. Finansallaşma literatüründe, ABD'de konut kredi piyasası tarafından tetiklenen 2008 küresel ekonomik krizinin ardından konut, inşaat ve bankacılık sektörü ve ilgili diğer sektörlerin politik ekonomisi daha fazla mercek altına alınmaya başlanmıştır. Kentsel coğrafyanın finansallaşması Türkiye gibi geç kapitalist ülkelerde de yaşanmaktadır. 1950'lerde çok partili hayata geçişle beraber inşaat ve emlak sektörünün önemi fark edilmiş; 1980'li yıllar neo-liberal ekonomiye entegrasyon açısından dönüm noktası olmuş, inşaat ve emlak sektöründeki

büyümeyi ekonomik büyüme izlemiştir. 2001 krizinden sonra iktidara gelen Adalet ve Kalkınma Partisi'nin benimsediği yeni ekonomik modelle, inşaat sektörü diğer ilgili sektörleri de canlandırmak amacıyla “lokomotif sektör” olarak konumlandırıldı. Tüketime dayalı milli gelir üretimine dayanan bu yeni ekonomik model finansallaşmanın tabana yayılmasını amaçlarken, hanehalkının borçluluk oranı 2002'de GSYH'nın %2si düzeyindeyken bu oran 2013'te %20 seviyesine yükselmiş, 2018'de ise %18 düzeyinde istikrar kazanmıştır. 1980 ve 2000 sonrası iki dönemde de gecekondulu konut yaratıcı yıkım sürecinde kilit bir rol oynamıştır. İlk dönemde gecekondulu konutlar imar afları ile finansal sisteme entegre edilirken aynı zamanda tek katlı gecekonduların yıkılarak yerine beş katlı apartman inşaatına izin verilmiş; ikinci dönemde ise gecekondulu yerleşim alanlarının kentsel dönüşüm proje alanı ilan edilmesi inşaat sektörü ve diğer ilgili sektörlerin canlandırılmış, imar barışıyla finansal sistem dışında kalan konutlar sisteme entegre edilmiştir. 2017 yılında, Türkiye'de inşaat sektöründe hacim endeksi % 8,9 artarak, % 7,4'lük büyüme oranını geçmiştir; ancak, Türk Lirasının aşırı değer kaybetmesi, ve faiz oranlarındaki yükseliş nedeniyle düşen konut satışları sebebiyle görünüm tersine dönmek üzeredir ((Arslan-Taç, 2019). Ankara'nın kentleşme ve konut sürecinin nasıl finansallaştırdığının ele alınması ve Türkiye'nin konut rejimini ve devletin bir paydaş olarak değişen rolünü değerlendirmekle eşdeğer olacaktır. Ankara'nın Başkent seçilmesi ile başlayan konut sorunu aslında devletin aktif bir finansal pazar aktörü haline gelişini ve son olarak inşaat ve emlak sektörü içinde konutun ulusal makro ekonomideki yerini de belirginleştirmiştir.

İnşaat sektörü üretiminin yaklaşık %60-70'ini oluşturan konut üretimi hızlı kentleşmeye bağlı olarak yeni yerleşim alanlarının gelişmesi ve kentsel dönüşüm gibi etki alanı daha geniş projeler, söz konusu faaliyetlerin yoğunlaştığı bölgelerde inşaat faaliyetinin gözle görünür ölçüde artmasına sebep olmuştur.

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**| ABSTRACTS & PROCEEDINGS |**

14. International Conference on Political Economy

**Inflation, Employment, and Inequality**

December 14-15, 2023, İstanbul, Turkey, [www.icopec.org](http://www.icopec.org)

Uzun, N. (2005). Ankara’da Konut Alanlarının Dönüşümü Kentsel Dönüşüm Projeleri [Transformation of Housing Areas in Ankara and the Projects of Urban Transformation Projects]. Tansı Şenyapılı (Ed.), Cumhuriyetin Ankarası Özcan Altaban’a Armağan (ss. 198-215), ODTU Yayıncılık.

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## **Inflation, Employment, and Inequality**

High inflation, rising unemployment, and deteriorating inequalities are among the biggest problems facing the global economy today. Inflationary pressures are gradually easing, but core inflation remains elevated and more stubborn than expected. Persistently high inflation has triggered the most aggressive cycle of rising interest rates in decades, leading to tighter financial conditions and heightened debt vulnerabilities. The lingering effects of COVID-19, rising geopolitical tensions, and tighter monetary policy are likely to weigh on global trade. The global economy faces the risk of a prolonged period of below-average growth or even a severe recession. There is a high risk of rising unemployment and worsening inequalities both within and between countries. Slow income growth would further undermine prospects for progress toward poverty eradication and other sustainable development goals.

The aim of this conference is to identify the dynamics and solutions to the problems of inflation, employment, and inequality and to examine what can be done for a better World. Besides its main theme, ICOPEC 2023 also invites and welcomes all contributions that enrich perspectives on political economy and broaden the ground for better policy analyses and designs.

