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Vsebina / Contents

Peter Vuk

(De)Globalisation and the New Industrial Policy 1

Dragomir Dimitrijević, Milan Kostić, Marija Radulović

Analysis of the Citizen's Attitudes About the
Economic Measures to Eliminate the
Consequences of the COVID-19 Pandemic in
the Republic of Serbia 15

Ahmet Lokce, Andrijana Bojadzievska Danevska

Establishing a Digital Participation Bank in
North Macedonia: Opportunities and Challenges
in Interest-Free Finance 25

Emir Sudžuka, Dženan Kulović, Domagoj Hruška, Jelena Nikolić

Perspectives on Corporate Governance in
State-Owned Enterprises: Evidence from
Bosnia and Herzegovina, Croatia and Serbia 34

Thouraya Boujelbène, Khoutem Ben Jedidia

Inflation, Inflation Uncertainty and
Economic Growth in Tunisia:
Nonlinear Modelling Framework 44

Ilyes Charchafa, Bilal Kimouche

Adoption of Social Media for Products Marketing
in Algerian Traditional and Handicraft Firms:
Evidence from Setif Province 58

(De)Globalisation and the New Industrial Policy

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Abstract

The processes of economic and political cooperation since the Second World War have stimulated economic growth and improved living standards and prosperity, while intensified economic integration and contributed to a better response to global challenges. Following the 2008 global financial crisis, there is a trend towards deglobalisation or slowbalisation. The article provides a comprehensive literature review and examines data sources on the situation and trends related to the globalisation of the world economy and the rise of industrial policy measures in advanced economies. It was found that the world economy is facing several challenges, including the reshaping of global supply chains, mitigating the effects of economic inequality and climate change, and the rise of economic populism and nationalism. This article consequently provides a comprehensive overview of the literature on globalisation and industrial policy, examining the interplay between deglobalisation processes and industrial policy measures and their increasing prominence in advanced economies.

Introduction

The outbreak of the COVID-19 pandemic at the end of 2019, the escalation of military conflicts worldwide, and the deterioration of relations between countries, such as the United States, China and Russia, have signalled a change in the world economy and geopolitics. Advanced economies, especially the United States, are considering reintroducing tariffs and other trade restrictions to protect their domestic (manufacturing) companies. At the same time, there is a growing body of evidence regarding companies diversifying their supply chains and moving production closer to end markets to reduce their dependence on foreign suppliers. Much of the current research work (e.g. García Herrero, 2022; Aiyar et al., 2023; Campos et al., 2023) suggests that structural changes towards deglobalisation, or slow globalisation, are occurring in the world economy.

Therefore, governments around the world have faced several challenges in recent years in relation to rising geopolitical tensions, the implementation of green and digital transition activities, and the rise of trade protectionism. Juhász, Lane & Rodrik (2024) identified state-led industrial policy (which is increasingly being linked to energy self-sufficiency and food security) as one way to stimulate the green transition, secure or maintain well-paid manufacturing jobs, and sustain industrial production, as well as to stimulate innovation activity and the development of new technologies.

This article examines the growing trend of economic deglobalisation and analyses industrial policies in advanced economies in the context of the deglobalisation of the world economy. By employing compilation and comparison methods, the article summarises and compares different findings, views and insights of the authors in the scientific literature. Our eclectic analysis shows that the process of deglobalisation is running parallel to the rise of practices involving an increasingly widespread use of industrial policy strategies and tools. This new industrial policy is gaining prominence, particularly in advanced economies, especially in industries and economic sectors characterised by the intense development of green technologies and information and communication technologies.

The remainder of the article is structured as follows: Section 2 provides an overview of the process of globalisation and indicators of globalisation of the world economy, Section 3 includes an analysis of the changes in the world economy and the processes associated with deglobalisation, Section 4 consists of a discussion of the importance of industrial policies, a review of empirical findings on the effectiveness of industrial policies and a presentation of the new industrial policy in the context of deglobalisation, and Chapter 5 concludes the article.

The Globalisation Process and Indicators of Economic Globalisation

Since the end of the Second World War, the world economy has become deeply integrated, both in terms of liberalisation of international trade and in terms of the increasingly easy cross-border movement of labour and capital, and the spill-over of knowledge and technology. Campos et al. (2023) suggested that the process of removing and reducing restrictions and barriers to international trade (i.e. trade liberalisation), supported by the development of adequate international transport infrastructure and technological advances, has led to

increased productivity and consequently higher economic growth, as well as raising living standards and reducing absolute poverty. Economic globalisation involves processes shaping the current economic environment and strengthening concrete economic exchanges between countries, intensifying international trade and international economic cooperation (Heimberger, 2022).

Aiyar et al. (2023) identified five key phases of economic globalisation. The first phase covers the period between 1870 and 1914 and is linked to the globalisation processes associated with industrialisation. The second phase covers the period between the First World War and Second World War, between 1914 and 1945, characterised by an increase in protectionist measures, e.g. at first in the United States, related to the Smoot-Hawley Tariff Act. The third phase, starting after the Second World War, involves the establishment and operation of the Bretton Woods system and lasts until 1980. This is followed by a period of liberalisation between 1980 and 2008. The post-2008 period is characterised as a period of slower globalisation, or slowbalisation, associated with persistent stagnation in international trade openness.

Economic globalisation, a process of increasing integration of world markets and international economic cooperation, has brought many benefits to countries worldwide. Balaam & Dillman (2019, pp. 38–39) explained that globalisation, which began to emphasise the role of free markets without state intervention in the mid-1980s, has led to an increase in the efficiency of production, the diffusion of new technologies and the creation of jobs due to increased demand. The dramatic reduction in transport costs encouraged outsourcing and international trade. Between 1995 and 2020, according to the WTO (2024), the cost of international trade fell by around 6% to 10% across various sectors globally, contributing to a significant increase in international trade, with most of the reduction in trade costs occurring between 1995 and 2008.

For decades, deepening international trade has helped developing economies to catch up with advanced economies in terms of per capita income and to reduce absolute poverty substantially. Low-income consumers in advanced economies have also benefited greatly from lower prices (Aiyar et al., 2023). The last three decades of global economic integration have boosted productivity and improved living standards, tripled the size of the world economy and lifted 1.3 billion people out of extreme poverty (IMF, 2023a, p. 20). GDP per

capita is a fundamental indicator of economic performance and is often used as a broader measure of average living standards or economic well-being. According to the World Bank (2024), world GDP per capita at constant 2015 prices has been increasing between 1960 and 2023, except for a few intermediate periods of crisis. The overall increase between 1960 and 2023 is 216.03%, with world GDP per capita rising from USD 3,663.80 in 1960 to USD 11,578.80 in 2023. Lang & Tavares (2024) highlighted the importance of globalisation for income gains in different countries around the world. In their study, they found that economic globalisation is driving income convergence between countries and income disparities within countries.

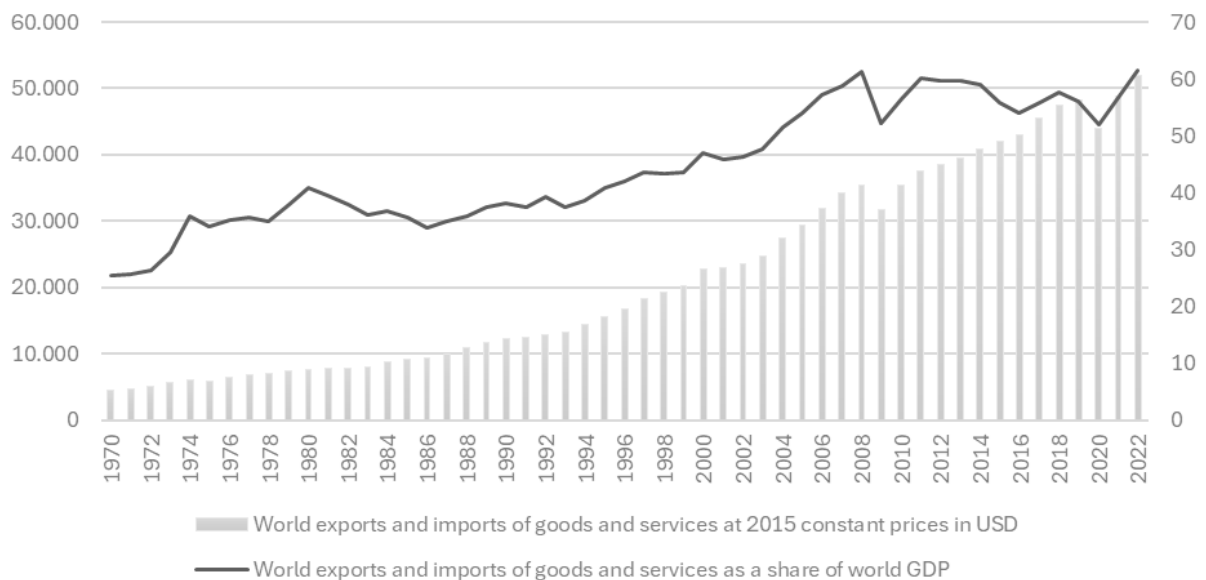
Between 1970 and 2022, world imports and exports of goods and services increased by USD 47,531.21 billion, or from 25.41% of world GDP to 61.53% of world GDP (Figure 1). Since 2008, world imports and exports of goods and services have continued to increase in absolute terms, while in relative terms it is possible to note that the share of world imports and exports of goods and services in GDP has started to stagnate, which

indicates a process of slower globalisation and is consistent with García Herrero's (2022) findings. Campos et al. (2023) also emphasised that trade integration has slowed down considerably since the 2008 global financial crisis, and that tariff and non-tariff trade policy instruments have regained momentum. Recent examples include trade tensions between the United States, China and other major economies, trade restrictions linked to the COVID-19 pandemic, and economic sanctions imposed in response to the Russia-Ukraine war.

The trend seems to have turned towards slower globalisation, what García Herrero (2022) refers to as slowbalisation. Slowbalisation is not a new concept, but a phenomenon that has been seen before, e.g. just before the First World War. Baldwin, Freeman & Theodorakopoulos (2024), on the other hand, argued that the recent decline in trade share is not a cause for concern, as trade in services is still growing and already accounts for a fifth of international trade, showing that globalisation is evolving and adapting, rather than declining.

Figure 1

Trends in world imports and exports of goods and services between 1970 and 2022, measured in constant 2015 prices in USD billion (left scale) and as a percentage of GDP (right scale)



Source: Author's calculations based on World Bank (2024) data

Darvas (2023) noted that the shares of the European Union and the United States in world output are stagnating or declining, rather than increasing, due to the rapid growth of China and some other developing economies, such as India. According to the data obtained

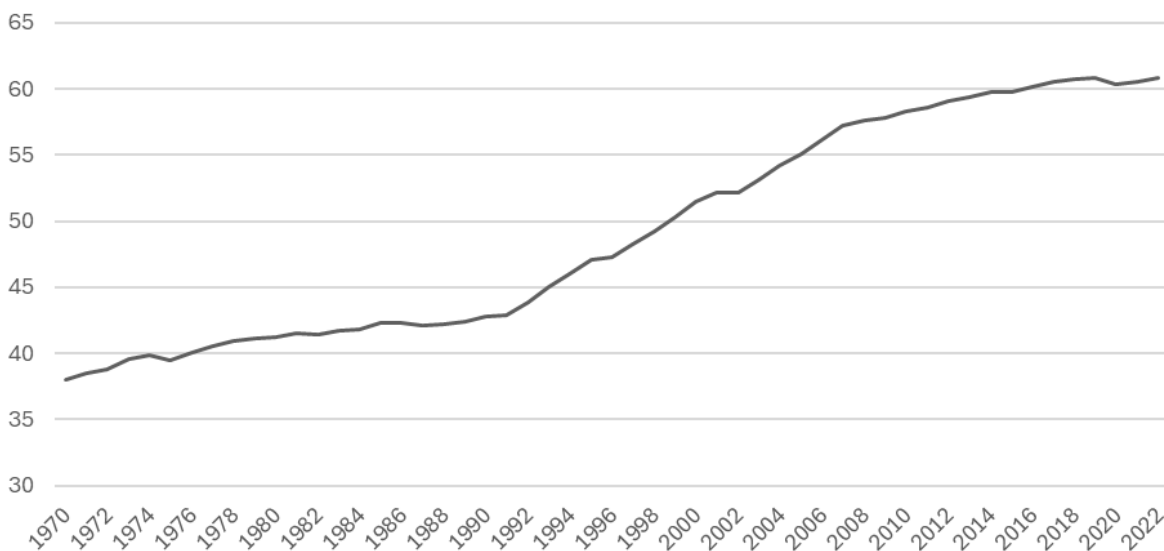
from the World Bank (2024), China's share of world GDP increased between 1989 and 2022, from 2.23% of world GDP in 1989 to 17.81% of world GDP in 2022. On the other hand, the European Union's share declined, from 25.41% of world GDP in 1989 to 16.60% of world GDP in

2022. The share of the United States remained constant throughout the analysed period. Recent trends also indicate the emergence of fragmentation of foreign direct investment and a decline in the share of net foreign direct investment inflows as a share of world GDP since 2008. World net foreign direct investment inflows declined by 3.53 percentage points of world GDP between 2007 and 2022, according to calculations based on World Bank (2024) data. IMF (2023b, p. 95) identified that several factors, such as increasing automation and geopolitical frictions, contributed to the slowdown in foreign direct investment before the COVID-19 pandemic. It is particularly important to highlight that strategic foreign direct investment flows to Asian countries started to decline in 2019, i.e. after the outbreak of the United States-China trade war, which is particularly reflected in Chinese net foreign direct investment inflows, which have fallen even more than the Asian average. By contrast, foreign direct investment flows to the United States and Europe have proved more resilient. Potrafke (2015) concluded that composite globalisation indices are one of the key tools for measuring and analysing the degree and impact of globalisation on different countries and regions. These indices combine several dimensions

of globalisation, including economic, political, social and cultural interconnectedness. Composite globalisation indices, such as the KOF Globalisation Index, allow for comparisons between countries and regions, as well as monitoring changes over time (Axel, 2006). The KOF Globalisation Index for the world has risen between 1970 and 2022 (Figure 2), indicating that economic, social and political interconnectedness between countries is increasing. In this context, the increase in the KOF Globalisation Index was particularly rapid in the 1990s, which is consistent with a period of intense liberalisation processes and the establishment of the World Trade Organisation in 1995. Following the 2008 global financial crisis, the growth of the KOF Globalisation Index has moderated, suggesting the possibility of slowbalisation. Rodrik (2011) emphasised that the process of economic globalisation has been gaining momentum since the 1970s, and was particularly intense in the 1990s, which is widely recognised as the hyperglobalisation period. After the financial crisis of 2008, however, globalisation stalled due to a slowdown in the pace of economic integration, as can also be seen in the trend of the KOF Globalisation Index.

Figure 2

KOF Globalisation Index for the World between 1970 and 2022



Source: KOF Swiss Economic Institute (2024)

Changes in the World Economy and Signs of a Deglobalisation Process

Aiyar et al. (2023, pp. 10–11) argued that despite the obvious benefits, discontent with globalisation is growing around the world. Intensifying geopolitical tensions have led to greater reliance on cross-border

restrictions for national security reasons and an increasing number of protectionist measures. Dadush (2022) and Zahoor et al. (2023) suggested that deglobalisation refers to the increasing disconnectedness of countries in areas such as international trade, capital flows, migration and technology transfer. This trend is reversing the economic

integration of the last century and a half, which has been interrupted only by world wars and economic crises. The world economy is therefore facing major challenges that can be broadly classified into four categories: (i) the transformation of global supply chains, (ii) the problem of economic inequality, (iii) the economic consequences of climate change, and (iv) the rise of economic nationalism and populism.

Firstly, disruptions in global value chains have led to product shortages, price increases and doubts about the resilience of global supply chains. Notably, some of the problems with supply chains in recent years have been due to unforeseen increases in demand rather than internal supply problems (Sandkamp, 2022). International trade generally helps to mitigate volatility by diversifying sources of supply and demand, but trade in key commodities, whose production is highly concentrated globally, can exacerbate crises. According to WTO (2023, p. 21), China and the United States were the main players in the supply of commodities between 2010 and 2021, where bottlenecks or supply disruptions can occur. During this period, the U.S. share has gradually decreased (by 2.1 percentage points between 2010 and 2021), while China has slightly increased its share (by 0.6 percentage points between 2010 and 2021). Between 2010 and 2021, the largest exporting countries of potential bottleneck products accounted for around 70% of the world's export value of products with the potential for supply disruptions. Bottlenecks in supply chains hamper economic activity in global value chains, and their severity depends on whether they affect upstream or downstream stages of production. Lasting negative impacts are likely to be particularly severe for goods such as semiconductors for which there are no substitutes, especially affecting countries with a large share of the automotive industry (Rees & Rungcharoenkitkul, 2021).

Cappariello et al. (2020, pp. 9–10) noted that individual countries and industries globally are becoming increasingly interconnected, not only through trade in finished products, but also as firms increasingly source intermediate raw materials and intermediate products from abroad. It appears that from 2000 to 2014, supply chains have become more interconnected, not only within countries but especially across national borders. Campos et al. (2023) estimated that fragmentation into three different trading blocs (Western, Eastern and Neutral) would have significant effects on trade between them, with trade flows potentially declining by between 22% and 57% in the most pessimistic scenarios. The welfare loss would be greatest in the Eastern bloc, where

the median country in the sample would suffer a welfare loss of up to 3.4%. Javorcik et al. (2023) noted that although friendshoring can provide insurance against extreme disruptions or increase the security of supply of important raw materials, it causes a real loss of output worldwide in the medium term, which they estimate would be between 0.1% and 4.6% of world GDP. Rethinking global value chains is strongly intertwined with the broader opposition to globalisation in many developed countries. This resistance arises from complex country-specific causes, but an important factor is the decline in manufacturing jobs in advanced economies (partly due to competition from imports of manufactured goods from China). While China's share of U.S. imports of goods has declined, its share of imports of goods into Europe has increased, and China has also increased trade and foreign direct investment in Mexico and Vietnam. This may suggest that the United States remains indirectly connected to China via countries such as Mexico and Vietnam (Alfaro & Chor, 2023). The people's resistance to globalisation observed in many parts of the world reflects the economic inequalities and geopolitical tensions that have encouraged the formation of different trade (and political) blocs. However, the current trend of deglobalisation remains fundamentally neoliberal, shifting from a global to a nationalist focus, while still concentrating on multinational corporations (Ghosh, 2022).

Secondly, examining the distribution of global income and wealth from the World Inequality Database (2024), we found that the richest 10% of the world's population in 2022 received 53.15% of global income, while the poorest half of the population earned 8.00% of global income. Global wealth inequalities are even more pronounced than income inequalities, with the poorer half of the world's population owning almost no assets (1.89% of total assets) in 2022. By contrast, the richest 10% of the world's population owned 75.85% of all assets in 2022. In this case, 50.61% of the wealth of the richest decile is held by the wealthiest one per cent. The trend in the distribution of income and wealth has also not changed much between 1995 and 2022, or has remained at relatively the same levels, with only a slight decrease in the share of the richest 10%, by 3.07 percentage points in the distribution of income and by 4.63 percentage points in the distribution of wealth (World Inequality Database, 2024).

In some developing countries, income inequality remains at very high levels, especially compared to developed countries, and has increased in recent years (Kebalo & Zouri, 2024). Although the share of the

population living below the poverty line has fallen significantly, the bottom decile of the income distribution has been left behind compared to those with average incomes. Additionally, income trends for the rising middle class have stagnated, while the share of the top 10% has increased in some developing countries (Bank for International Settlements, 2018, pp. 37–39). The factors that cause income inequality are very diverse, including technological progress, inflation, international trade, the redistributive effects of fiscal policy linked to tax policy and social transfers, and demographic and social factors, such as migration and population ageing (Berisha, Dubey, & Gharehgozli, 2023; Baek, Noh, & Ahn, 2023; Malla & Pathranarakul, 2022). Globalisation might also contribute to widening inequality through changes in the relative prices of goods consumed by different income groups; since low-income consumers spend a greater share of their income on housing and food than those with higher incomes, these changes may have had a disproportionately negative impact on the economic well-being of the lowest-income groups (Fajgelbaum & Khandelwal, 2016). Moreover, Shin (2012), Berg et al. (2018) and Topuz (2022) noted that greater income inequality in a country might be a result of several factors, such as credit market imperfections, constraints on investment in human capital, and political decisions on tax policy, hampering economic growth.

Thirdly, one of the main global challenges affecting people's living standards and future economic activity is also tackling the (economic) consequences of climate change. Their (negative) impact is expected to intensify in the future, especially about the financial instability they cause. Despite this uncertainty, it is possible to predict that the costs of climate change will be significant and unevenly distributed (Breckenfelder et al., 2023). A study by Waidelich et al. (2024) found that if the planet warms by more than 3°C, global GDP is projected to decline by 10%, with the most severe effects (up to 17%) in poorer countries at low latitudes. In addition, the study concludes that limiting global warming to 1.5°C would reduce the global economic costs of climate change by around two-thirds. Newman & Noy (2023) estimated the global cost of extreme weather events attributable to climate change between 2000 and 2020 at USD 143 billion per year. The costs associated with climate change therefore have significant negative impacts on individuals, businesses, communities and economies, as well as on society. Clement et al. (2021, pp. 82-83) concluded that, globally, in a pessimistic reference scenario, the number of climate migrants could reach 216.1 million by 2050, due

to climate change being an increasingly important driver of migration.

According to the International Energy Agency (2024), between 2021 and 2023, annual investment in clean energy grew by 24%, while investment in fossil fuels grew by 15%. In recent years, spending on clean energy has increased, especially in certain countries, notably China, the United States, the European Union, India, Japan and countries in the Middle East. In 2022, more than 60% of investment in renewable technologies was in solar, including photovoltaics. Investment in solar photovoltaics alone has reached almost USD 300 billion. Investment in solar photovoltaics has increased significantly, coinciding with a reduction in the cost of this technology, which has fallen from USD 0.42 per kilowatt hour in 2010 to USD 0.05 per kilowatt hour in 2021. Wind energy investments worldwide amounted to about USD 174 billion in 2022, representing about 35% of total global renewable energy investments (Statista, 2024). In conjunction with the growing importance of the green transition, green financial instruments such as green bonds, which are used to finance projects with a positive impact on the environment, have also experienced significant growth in recent years (Malorgio, Teti, & Dallochio, 2021).

Finally, the growing public perception that the (economic) losses from globalisation outweigh the gains could provoke a backlash and a transformation of the world economy towards deglobalisation. Indeed, negative attitudes towards globalisation are growing in developing as well as developed countries, and despite the potential benefits of foreign direct investment, public attitudes towards it are not as positive as might be expected. In several countries, opposition to further international cooperation and the deepening of international flows of labour and capital has also led to a political backlash, including economic nationalism and populism (Halmai, 2023). The primary driver behind the rise of populist parties is popular discontent stemming from the gradual decline in the share of labour income in aggregate income and the declining demand for low-skilled labour. Economic research indicates that those on the losing side of these developments are turning to support populist parties with protectionist and nationalist agendas (Fetzer & Gold, 2019). The increasing prominence of nationalist and populist movements worldwide is raising concerns about the future of international economic cooperation. Central to these concerns is the belief that nationalist and populist governments will restrict free trade, which is one of the key drivers of the globalisation of the world economy

(Mansfield & Pevehouse, 2022). Furthermore, the evidence of the economic harmfulness of trade restrictions and tariff wars is compelling. Barattieri, Cacciatore & Ghironi (2021) found that protectionism does not stimulate economic activity and, in the short term, mainly contributes to higher inflation and lower output. Furceri et al. (2018) examined the macroeconomic impact of tariffs between 1963 and 2014 on a sample of 151 countries and found that higher tariffs have a negative impact on productivity and output in the medium term, contributing to higher unemployment and increasing economic inequality.

Kostadinova (2024), in a study of 10 Eastern and Central European countries for the period 1996–2016, found that populist politicians in power do not reduce corruption and are no more likely to eliminate corrupt practices than non-populist governments. The study also found that there is strong empirical evidence that corruption levels increase when populists rule, primarily due to their authoritarian influence on institutions. Kleinfeld (2023) noted that even pro-business populism often prioritises political objectives over economic issues, which may have harmful consequences. Funke, Schularick & Trebesch (2023) found that populist governance significantly hinders economic growth. According to their study of populist leaders from 1900 to 2020, GDP per capita is found to be 10% lower after 15 years compared to a plausible non-populist counterfactual. On the other hand, Acemoglu et al. (2019) conducted a study on a sample of countries from 1960 to 2010 and found that democracy fosters economic growth, with its impact being both significant and substantial.

The Return of Industrial Policy in a Deglobalising World

In response to the economic turmoil of the COVID-19 pandemic and escalating geopolitical tensions, many policymakers have turned to promoting protectionism and enhancing the resilience of national economies, particularly through increasingly active state-led industrial policy (Millot & Rawdanowicz, 2024; Di Carlo & Schmitz, 2023). Whereas before the COVID-19 pandemic, the active pursuit of industrial policy was frequently met with criticism in public discourse, however, industrial policy is now openly discussed and actively pursued (Andreoni & Chang, 2019). Dissatisfaction with globalisation and the loss of manufacturing jobs in advanced economies has led to a rise in industrial policy measures and trade protectionism. Industrial policies are also driven by the

need to accelerate the decarbonisation and digitalisation of economies (Terzi, Sherwood, & Singh, 2023).

The term industrial policy only came into active use after the Second World War, but even then, it was already causing controversy and problems in public discourse. While industrial policy has lost its relevance in many advanced economies, East Asian economies have used it as one of the key tools to stimulate industrial production and the subsequent increase in economic activity, and to reduce the development gap with advanced Western economies (Andreoni & Chang, 2019). Rodrik (2009, p. 3) defines industrial policy as the stimulation of specific economic activities and the promotion of structural changes within these sectors. In this context, industrial policy instruments are not only aimed at economic activities related to manufacturing. Juhász et al. (2022) noted that, as industrial policy is geared towards structural change, its key feature is that it is implemented by its promoters in a discretionary manner. Industrial policies are also often associated with innovation policies. Traditionally, industrial policy has often focused on vertical sectoral implementation of measures. Well-defined tasks or missions aimed at tackling major societal challenges set the direction for solutions, but not the precise pathways to success. Instead, missions encourage the development of different approaches and solutions to achieve the set goals (Mazzucato, 2018).

The objectives of industrial policy may include addressing market failures, fostering the transformation of the economic structure, promoting economic development and innovation, and enhancing international (export) competitiveness (Juhász et al., 2022; Juhász, Lane, & Rodrik, 2024). Andreoni & Chang (2019, p. 137) explained that the origins of industrial policy are linked to the development of the infant industry argument. The infant industry argument has its origins in the German Historical School of Economics, with reference to the German economist Friedrich List, one of the most famous 19th-century advocates of protectionism. List believed that in the early stages of industrial development, countries needed to protect their domestic industries from foreign competition to develop and consolidate infant industrial firms (Brue & Grant, 2013, pp. 210–213). Another frequently used argument to justify industrial policy interventions is the presence of sectoral externalities, where the benefits of the externalities outweigh the costs and risks of the planned activities. Therefore, for an industrial policy measure to improve welfare, it should effectively address the externality (Crisuolo et al., 2022, p. 9). Hausmann & Rodrik (2003) also developed the information externality

argument, which explains that a firm that enters a new industry before others generates new information about the desirability of entering the industry for other potential entrants, and therefore it is justified to provide support to pioneering or innovative firms in the form of targeted industrial policy measures. Governments also often seek to boost innovation to stimulate economic growth, as countries with higher R&D spending tend to be wealthier (Bloom, Van Reenen, & Williams, 2019). The expectation that public funding will achieve large social benefits is essential to legitimate both industrial and innovation policy (Laplane & Mazuccato, 2020).

Juhász, Lane & Rodrik (2024, p. 16) found that earlier empirical studies on the effectiveness of industrial policy measures have reported findings of general ineffectiveness of industrial policy measures, finding that the level of subsidies or measures related to the protection of domestic manufacturing firms were generally negatively correlated with performance measures such as industry-specific productivity (e.g. Osborn Krueger & Tuncer, 1982; Lee, 1996; Lawrence & Weinstein, 1999). On the other hand, more recent empirical studies often draw opposite conclusions. Lane (2024) examined the impact of South Korea's industrial policy measures between 1973 and 1979 on the country's subsequent industrial development and found that this temporary driving force has shifted Korean production to more developed markets and thus created lasting changes in the economy, which may explain, among other things, South Korea's rapid economic development. South Korea's industrial policy measures in the 1970s were also analysed by Choi & Levchenko (2024), who found that subsidised firms grew faster than those that were never subsidised 30 years after the subsidies ceased, and that the measures had greater benefits than costs. Many empirical studies focus on the effectiveness of industrial policy instruments supporting R&D through subsidies, such as tax incentives or government grants. Dechezleprêtre et al. (2016) analysed the impact of R&D tax incentives on innovation and found that tax changes have a statistically and economically significant impact on R&D and patenting. Appelt et al. (2023) found that the effectiveness of public incentives for R&D tends to vary across countries and firms, and is higher for early-stage, emerging and small firms than for large or multinational firms. In addition to the effectiveness of public R&D incentives, the empirical literature has also examined several examples of the use of sectoral industrial policy measures. Juhász, Squicciarini, & Voigtl (2023) examined changes in cotton spinning during the first industrial revolution in France, estimating that the productivity of French mechanised cotton spinning mills increased

significantly (by 82%) between 1806 and 1840, when mechanisation had already been adopted. The sectoral effects of industrial policy have also been studied by Hanlon (2020), using the example of the international shipbuilding industry from 1850 to the period just before the First World War. Hanlon (2020) found that initial price advantages of inputs can have a long-term impact on the spatial distribution of production and trade patterns.

Global changes related to the impact of the COVID-19 pandemic, the rise of geopolitical conflicts, and climate change have raised concerns about the resilience of supply chains, economic and national security, and energy and food security. Evenett et al. (2024, p. 5) found that, on average, there is a 73.8% probability that a subsidy granted by the European Union, China, or the United States for a particular product will prompt a response from one of the other two countries in the form of a subsidy for the same product within one year. Juhász et al. (2022, pp. 15–16) noted that 25% of the economic policy measures recorded in the Global Trade Alert database can be classified as industrial policy measures in their model. This suggests that industrial policy measures are considerably widespread. Juhász, Lane & Rodrik (2024, pp. 12–13) argued that high-income countries have recently been the main implementers of industrial policy. Although industrial policy is nowadays implemented worldwide, it is more widespread in advanced economies. In emerging economies and countries of the Global South, fiscal constraints limit public spending on such policies, which is one of the reasons why the green transition is being promoted more intensively through industrial policies in more advanced economies. Evenett et al. (2024, p. 19) also examined the reasons given by the governments of the countries in the sample for implementing new industrial policies in 2023. They found that the main reason cited for implementing new industrial policy measures in 2023 was the strategic competitiveness of national economies (37.0%), followed by climate-related issues (28.1%), supply chain resilience (15.2%), and geopolitical and national security issues (19.7%), noting that the survey only includes officially stated motives, and therefore does not contain direct evidence of promoting trade protectionism (and consequently trade protectionism is not cited as a reason for implementing industrial policies). Juhász, Lane & Rodrik (2024), Di Carlo & Schmitz (2023), Aiginger & Rodrik (2020) and Reynolds (2024) noted that the use of industrial policy has changed considerably in recent years, due to several changes in the economy and in a context of intensified geopolitical tensions. The new industrial policy targets a greater number of objectives (and consequently employs a greater number of

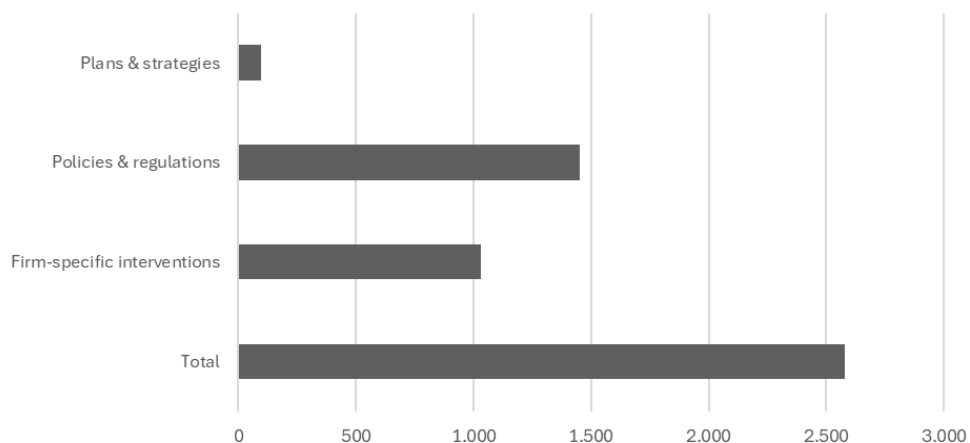
instruments) than in the past, with a greater emphasis on the green and digital transition, preserving well-paid middle-class jobs, fostering innovation (emphasizing a bottom-up approach), and stimulating small and medium-sized enterprises, rather than solely focusing on the development of national champions, as in the past.

Both the European Union and the United States are facing growing threats to their economic security from China. One of the most recent examples is the production of electric vehicles and the critical earths needed for battery production, a particularly pressing issue for the European Union and its historically significant automotive industry (Bown, 2024). In the United States, as noted by Artecona & Velloso (2022) and Millot & Rawdanowicz (2024), several industrial policy packages have been adopted in recent years, including the CHIPS and Science Act, the Inflation Reduction Act and the Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Act. In March 2020, the European Commission presented a new industrial strategy for Europe, which was subsequently updated in May 2021 in view of the challenges encountered by the member states following the COVID-19 pandemic. Since 2021, the European Commission has published several legislative proposals related to the new industrial strategy, mainly in response to changes in U.S. industrial policy. Beginning in 2021 and continuing into 2022, the Horizon Europe programme, which aims to fund research and stimulate innovation between 2021 and 2027, and the REPowerEU plan, which aims to encourage a gradual reduction of Russian fossil fuel imports into the European Union, were adopted; and in 2023, the Green Deal Industrial Plan for the Net-Zero Age and the European Chips Act were approved (European Commission, 2024). García Herrero

& Schindowski (2024, pp. 3–5) and DiPippo, Mazzocco & Kennedy (2022) noted that China's new industrial strategy is closely tied to the Made in China 2025 programme, a multilateral policy initiative launched in 2015, designed to propel the Chinese economy towards innovation-driven production of high value-added products and services. In addition, Made in China 2025 can also be linked to the 10,000 Little Giants initiative, which aims to support Chinese small and medium-sized enterprises. DiPippo, Mazzocco & Kennedy (2022) estimated that China's industrial policy spending in 2019 was substantial, amounting to at least 1.73% of China's GDP. The adoption of new industrial policies and their growing importance in economies such as China, the United States and the European Union has led to a response in the form of the introduction of similar measures in other advanced economies, such as Canada, South Korea, Japan and the UK (Millot & Rawdanowicz, 2024, pp. 43–49).

Evenett et al. (2024) classified industrial policy measures into three different levels of intervention in the NIPO database, ranging from plans and strategies to policies and regulations, and firm-specific interventions. An analysis of the 2023 data reveals that policies and regulations were the most prevalent, followed by firm-specific interventions, while high-level plans and strategies were the least frequent (Figure 3). Thus, in 2023, a total of 2,580 unilateral government interventions were recorded, which are classified as industrial policy measures in the NIPO database. Evenett et al. (2024, p. 16) further noted that 70.9% of all interventions in 2023 were in advanced economies, with the United States, China and the European Union accounting for 47.7% of all interventions.

Figure 3
Levels of industrial policy measures in the NIPO database in 2023



Source: Evenett et al. (2024)

Another issue that has recently emerged is the outlook for the future implementation of industrial policies. The debate on international trade and industrial policy in the United States has focused, especially after Trump's re-election, mainly on trade protectionism, with Trump advocating high tariffs. Trump's victory also raises concerns about the impact on climate policies and continued dependence on fossil fuels, including pre-election promises to repeal the U.S. Inflation Reduction Act (The Economist, 2024a, 2024b). The member states of the European Union are also confronted with significant challenges. The European automotive industry is facing several challenges, including strikes at Volkswagen over plant closures, the collapse of the Swedish start-up Northvolt, and possible disruption from tariffs that may be imposed by the new Trump administration. The European automotive industry is also being hit hard by growing competition from Chinese electric vehicle manufacturers and by declining sales in key markets such as China and the United States. The outlook for European automotive manufacturers appears unfavourable as they face overcapacity, rising costs and stagnating sales (The Economist, 2024c). Aiginger & Rodrik (2020) argued that industrial policies need to be aligned with societal objectives, and that addressing market failures is important, but that there needs to be an awareness that industrial policy objectives should be more ambitious and long-term oriented, including a mission and an intention to develop and implement new technologies.

Conclusion

The article concludes that the world economy is facing signs of deglobalisation or slowbalisation and the rise of industrial policy measures, which is particularly evident in advanced economies. There are growing geopolitical tensions between the world's major economies or economic blocs, related to the outbreak of the United States-China trade war after 2018, the COVID-19 pandemic and the large-scale disruption of supply chains, and the Russia-Ukraine conflict, which has highlighted the importance of food and energy security for European

economies. At the same time, the world economy is also facing other challenges, such as the increasing negative impact of climate change on the environment and the economy, the issue of economic inequality, and the rise of economic nationalism and populism. Advanced economies have also seen a decline in the share of manufacturing in GDP in recent decades, leading to a subsequent decline in employment in traditional industries.

A notable shift in industrial policy implementation has taken place in the aftermath of the COVID-19 pandemic with the passing of the U.S. Inflation Reduction Act and the CHIPS and Science Act. The European Union has adopted several aid packages, of special relevance are the Green Deal Industrial Plan and the European Chips Act. China has continued to promote its industrial sector through initiatives such as Made in China 2025 and 10,000 Little Giants. Other advanced economies, such as Canada, the UK, Japan and South Korea, have also adopted new industrial strategies and measures related to industrial policy instruments. Although industrial policy is being implemented worldwide, it is becoming more widespread in high-income countries, as noted by Evenett et al. (2024) and Juhász, Lane, & Rodrik (2024). While industrial policy has the potential to drive the green and digital transition, the realisation of these positive effects is not assured. A successful industrial policy requires transparency over funding and an inclusive and transparent allocation of subsidies. This raises the question of whether the current wave of industrial policies can avoid the pitfalls of the past. Governments are convinced that this is the case and are quick to highlight perceived successes. At first glance, these trends appear promising; however, the key question remains how this issue will evolve moving forward. Economic history shows that with the introduction of industrial policies in countries, the line between achieving desirable development goals and economic well-being, and a series of budgetarily expensive yet unsuccessful projects that inevitably distort the competitive forces of markets and strengthen economic protectionism, is often very thin.

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(De)globalizacija in nova industrijska politika

Izvleček

Procesi gospodarskega in političnega sodelovanja po drugi svetovni vojni so spodbujali gospodarsko rast ter izboljšali življenjski standard in blaginjo prebivalstva, hkrati pa okrepili gospodarsko povezovanje in prispevali k boljšemu odzivanju na globalne izzive. Po svetovni finančni krizi leta 2008 je opazen trend deglobalizacije ali upočasnjene globalizacije. Članek podaja pregled literature in podatkovnih virov o razmerah ter trendih, povezanih z globalizacijo svetovnega gospodarstva in porastom ukrepov industrijske politike v razvitih gospodarstvih. Ugotovljeno je bilo, da se svetovno gospodarstvo sooča s številnimi izzivi, med drugim s preoblikovanjem globalnih dobavnih verig, blaženjem učinkov ekonomske neenakosti in podnebnih sprememb ter porastom ekonomskega populizma in nacionalizma. Članek posledično ponuja celovit pregled literature o globalizaciji in industrijski politiki ter obravnava medsebojno prepletanje procesov deglobalizacije in ukrepov industrijske politike ter njihov vse večji pomen v razvitih gospodarstvih.

Ključne besede: svetovno gospodarstvo, industrijska politika, globalizacija, deglobalizacija

Analysis of the Citizen's Attitudes About the Economic Measures to Eliminate the Consequences of the COVID-19 Pandemic in the Republic of Serbia

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Abstract

The pandemic caused by the COVID-19 virus has led to negative economic consequences in all countries. The COVID-19 pandemic created problems in the functioning of the economy, and economic state measures were necessary to reduce the negative impact of the pandemic. Every country in the world has tried to find the best economic measures to help its citizens overcome the negative effects of the pandemic as easily as possible. After 5 years since the pandemic began, the real effects of these state measures, which were also implemented by the Government of the Republic of Serbia, can now be seen much more objectively, which is analysed in this paper. The primary objective of this paper is to evaluate citizens' opinions on the effectiveness of the state economic measures implemented by the Government of the Republic of Serbia to mitigate the impact of pandemics on both citizens' lives and companies' operations.

Introduction

The COVID-19 pandemic has completely changed the way of life, not only in terms of health problems (a large number of sick and deceased people around the world) but also in terms of how people and the economy work daily. It can be said that the negative impacts of this pandemic have significantly altered the global economy. Even the most developed countries, especially developing and underdeveloped countries, were not spared from these negative consequences. No one predicted that COVID-19 would have a major negative impact, and no country had prepared measures to react to this type of crisis. The goal of each state during the pandemic was to adopt certain economic measures that would mitigate the negative effects of the pandemic. Those economic measures varied from state to state, but their essence was based on providing financial aid or tax relief to citizens and businesses. Each country attempted, within its economic possibilities, to adopt suitable economic measures. For these reasons in particular,

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this paper considers the economic measures the Serbian Government implemented to mitigate the negative effects caused by the COVID-19 pandemic. More precisely, it analyses citizens' views on the effects of these measures in terms of their speed of adoption, effectiveness, necessity and efficiency.

By the above, besides the Introduction and Concluding remarks, the paper also contains three sections. The first section outlines the economic consequences of the COVID-19 pandemic and the measures taken by the Serbian Government in this regard. The paper's second section explains the research methodology, while the third section presents the research results.

Economic Consequences Caused by the COVID-19 Pandemic and Measures to Mitigate Them

The immediate impact of the COVID-19 pandemic on the economy is reflected in a strong GDP decline that has covered all world regions. The estimated world GDP decline in 2020 was 4-4.5%, which is the largest annual decline in peacetime since the beginning of the 20th century. Another characteristic of the crisis is that it was widespread, meaning it occurred in all regions of the world. Compared to the previous ones, the third important feature of this crisis is that the pandemic initiated it as a non-economic factor, acting exogenously on the economy (Arsić, 2021, p. 58).

At the beginning of the COVID-19 pandemic, it was clear and inevitable that all countries would suffer economic consequences. In 2020, many countries decided to financially support the economy to overcome the negative effects of the pandemic, hoping that the pandemic would end quickly and that the economy would return to normal. Governments worldwide responded by providing large funds to businesses and individuals to help overcome the consequences of the crisis. Thus, to ensure liquidity, the US government approved more than four thousand billion dollars in various types of aid, while the G20 countries allocated

over eleven thousand billion dollars.

A large number of governments prepared and adopted significant packages of measures to alleviate urgent problems. An important way out was to increase the volume of primary money emissions and turn to fiscal policy, which meant deferral of various types of tax obligations and fiscal benefits in the form of grants to vital sectors and socially vulnerable people (Živković et al., 2021). One of the specifics of this crisis is the extremely uneven decline in economic activity. The crisis strongly affected activities exposed to epidemiological restrictions, such as hospitality, the hotel industry, transport, culture, sports, and entertainment (OECD Policy Responses to Coronavirus (COVID-19) 2021).

Most states approved transfers to citizens (helping the poor, the unemployed or even all citizens) to mitigate the decline in private consumption, the decrease in employment and the growth of poverty. States also approved transfers to the economy (payment of wages by the state, bank loan guarantee, direct transfers to particularly affected economic sectors, etc.) to improve the economy's liquidity, reduce layoffs and prevent mass corporate bankruptcy cases.

In general, all the measures taken by the states against the consequences of the pandemic-induced closure can be divided into those related to: *tax incentives* – deferral of the payment of taxes and social insurance contributions on employee salaries and wages in the private sector; *incentives aimed at employees* – direct government grants aimed at maintaining employment and *credit incentives* – more favorable credit arrangements intended for business entities to preserve the company liquidity.

The Republic of Serbia took appropriate measures, the main goal of which was to preserve economic stability with a focus on supporting micro, small and medium enterprises in the private sector. It was a set of economic measures aimed primarily at mitigating the consequences of the COVID-19 pandemic. All types of these measures are presented in Table 1.

Table 1

Program of economic measures to combat the negative consequences of the pandemic

Measure	Billions of dinars (RSD)	Millions of euros (EUR)	% of GDP
1. Tax policy measures	161	1.3	2.9
<ul style="list-style-type: none"> Deferral of the payment of taxes on wages and contributions for the private sector during the state of emergency, with later repayment of the resulting obligation in instalments starting from 2021 at the earliest; Deferral of advance payment of profit tax in the second quarter; Exemption of donors from the obligation to pay VAT. 	140	1.18	2.5
	21	0.12	0.4
	-		
2. Direct aid to companies for employees	97.3	0.82	1.8
<ul style="list-style-type: none"> Direct aid to entrepreneurs taxed at a flat rate and those who pay real income tax, micro, small and medium-sized enterprises in the private sector – aid payment in the amount of the minimum wage (during the state of emergency – 3 minimum wages); Direct aid to large companies in the private sector – aid payment in the amount of 50% of the net minimum wage (during the state of emergency) for employees with the decision on employment termination. 	92.8	0.79	1.7
	4.5	0.03	0.1
3. Measures for economic liquidity	246	2.04	3.7
<ul style="list-style-type: none"> Support to the economy through the Development Fund of the Republic of Serbia; Guarantee scheme to support the economy through banks. Including state guarantees (according to statements by officials) 	24	0.01	0.4
	240	2.03	3.3
	60	0.05	1.1
4. Other measures	86	0.7	1.6
<ul style="list-style-type: none"> Moratorium on the payment of dividends until the end of the year, except for public companies; Payment of 100 euros to all adult citizens. 	16	0.11	0.3
	70	0.59	1.3

Source: Fiskalni savet (2020)

In addition to these incentives, the National Bank of Serbia introduced a moratorium (stoppage) in loan and lease repayment without charging default interest for late loan payments. The idea was to help companies reduce their credit burden and increase liquidity. The Serbian Government allocated about 15.4% of GDP to remediate the consequences of the COVID-19 pandemic (Fiscal Monitor, IMF, 2021).

These initial measures, which estimate the views of businessmen and authors of various studies, have been carefully considered. However, they are currently being criticised for being unselective. Also, the professional community is critical of the delay in adopting these measures. The *Poslovi Infostud* (leading site for recruitment in Serbia) research on the impact of the pandemic on the labor market in the Republic of Serbia, conducted in the first week of April 2020, among 4,329 respondents and 580 business entities, shows that as many as 80 percent of companies have already started or are planning to cut costs soon, and about 12 percent

of respondents have already lost their jobs. At the same time, as many as 82 percent of Serbian companies that participated in this research point out that they agree with the measures adopted by the Serbian Government (Đaković, 2020). The measures adopted by the Serbian Government, although indiscriminate and with a certain delay, managed to some extent mitigate the large layoffs planned at the moment when the COVID-19 crisis began. The rest of the paper will investigate how the citizens of Serbia saw the measures taken and whether they saw them as effective.

Research Methodology and Sample Description

The research was conducted to assess citizens' views on the success of the economic measures taken by the Serbian Government to mitigate the consequences of the COVID-19 pandemic on the economy and citizens. Respondents over the age of 20 from the entire territory

of the Republic of Serbia were included in the research, and the questionnaire consisted of 25 questions. The research was conducted from December 2022 to February 2023. The questionnaire was constructed specifically for this study to reflect the unique socio-economic context of Serbia during the post-pandemic recovery period. Before the main data collection, the questionnaire underwent a pilot test with a small group of participants ($n = 15$) to ensure the clarity and relevance of the questions. Based on the feedback obtained during pilot testing, minor modifications were made to enhance the wording and structure of the questions. Data were collected electronically through Google questionnaires and analysed using the Statistical Package for Social Sciences (IBM SPSS, Version 21.0). The Kruskal-Wallis test was used to compare data between groups. Given that some groups of the independent variables had small sample sizes, the non-parametric Kruskal-Wallis test was more appropriate for the data analysis than the parametric one-way ANOVA (Nahm, 2016; Kruskal and Wallis, 1952; Dwiedi, Mallawaarachchi, and Alvarado, 2017). The research sample consisted of 179 respondents, including both sexes, and the structure of the respondents is presented in Table 2.

Table 2*Respondents' social and demographic characteristics*

Variable	N	%
Sex		
Male	125	69.80
Female	54	30.20
Age		
20 - 30	79	44.10
30 - 40	45	25.10
40 - 50	31	17.30
50 - 60	9	5.10
Older than 60	15	8.40
Education		
Primary school	4	2.20
High school	17	9.50
College	10	5.60
University	148	82.70
Employment status		
Unemployed	11	6.20
Retired	14	7.80
Student	39	21.80
Employed	115	64.20

Source: Authors

Research results and Discussion

Based on the data from the survey, it can be concluded that, in the respondents' opinion, not a single country was

prepared for the COVID-19 pandemic (72.60%) (Table 3). More than 85% of respondents believe that the COVID-19 pandemic highlighted the large gap between rich and poor countries and that poor countries depend on aid from rich countries. Additionally, more than 60% of respondents believe that the pandemic has demonstrated that richer countries cope better in such crises than poorer ones and that there is a need to connect underdeveloped and developing countries to overcome this type of crisis.

Table 3*Respondents' views on the consequences caused by the COVID-19 pandemic*

Variable	N	%
The world economies were prepared for the consequences caused by the COVID-19 pandemic.		
Yes, only developed countries	43	24.00
Yes, only developing countries	1	0.60
Yes, all countries	5	2.80
No, not a single country category was prepared for the pandemic	130	72.60
The COVID-19 pandemic has highlighted the large gap between rich and poor countries.		
Yes	155	86.60
No	24	13.40
The COVID-19 pandemic has shown that rich countries cope better with such crises than poor ones.		
Yes	108	60.30
No	71	39.70
The COVID-19 pandemic has shown that poor countries depend on the aid of rich countries.		
Yes	152	85.40
No	26	14.60
The COVID-19 pandemic has highlighted the need to connect underdeveloped and developing countries.		
Yes	110	61.50
No	8	4.50
Probably	61	34.00

Source: Authors

Table 4 shows the respondents' views on the readiness of the Republic of Serbia to face the negative effects of the COVID-19 pandemic. Most respondents (46.20%) believe that the Republic of Serbia was no less prepared than other countries to face the negative effects of the COVID-19 pandemic. However, 26.90% of respondents believe it was still less prepared to face such a crisis than the European Union countries. Additionally, 20.30% of respondents believe that Serbia was less prepared to face

the crisis compared to the rest of Europe, while the smallest percentage of respondents (6.60%) think that Serbia was less prepared for the crisis than other Balkan countries. It follows that the respondents believe that the Republic of Serbia was equally or less prepared for this kind of crisis compared to other countries globally. However, it was still better when compared to other Balkan countries.

Table 4
Respondents' views on the readiness of the Republic of Serbia for the negative effects of the COVID-19 pandemic

Variable	N	%
The Republic of Serbia was less prepared for the negative effects of the COVID-19 pandemic compared to other European countries.		
Yes, compared to all European countries	37	20.30
Yes, only compared to the Balkan countries	12	6.60
Yes, only compared to European Union countries	49	26.90
No	84	46.20
The Republic of Serbia was less prepared for the negative effects of the COVID-19 pandemic compared to the Balkan countries.		
Bosnia and Herzegovina	8	10.10
Montenegro	11	13.90
North Macedonia	5	6.30
Albania	9	11.40
Croatia	21	26.60
Bulgaria	11	13.90
Romania	14	17.70

Source: Authors

On a scale from 1 (not affected) to 5 (very affected), the respondents rated how certain economic sectors in Serbia were affected by the COVID-19 pandemic. Respondents believe that the tourism and hospitality sector was the most affected by the COVID-19 pandemic, followed by the production and transport sectors, while, in their opinion, the energy and public sectors were the least affected. This was the real situation with the external COVID-19 crisis. Additionally, respondents believe that the trade sector was the most successful in responding to the problems caused by the COVID-19 pandemic, followed by the finance and banking sectors, while the tourism and hospitality sectors were the least successful in responding to these problems (Table 5).

Table 5
Affected sectors of the Serbian economy and the success of the response to the problems caused by the COVID-19 pandemic

Variable	N	M	SD
Affected sectors of the Serbian economy by the COVID-19 pandemic (from 1 – not affected to 5 – very affected)			
Tourism and hospitality	178	4.63	0.80
Production	179	3.73	1.02
Transport	179	3.49	1.23
Finance and banking	179	3.27	1.12
Trade	178	3.22	1.38
Agriculture	179	3.06	1.19
Public sector	179	2.72	1.22
Energy	178	2.70	1.18
Success of the economic sector in its response to the problems caused by the COVID-19 pandemic (from 1 - not successful to 5 – very successful)			
Trade	179	3.34	1.11
Finance and banking	179	3.31	1.07
Agriculture	178	3.16	1.09
Energy	178	3.15	1.02
Production	179	3.08	0.96
Transport	178	2.96	1.05
Public sector	179	2.94	1.11
Tourism and hospitality	179	2.33	1.14

Note: N – number of respondents; M – arithmetic mean; SD – standard deviation

Source: Authors

Table 6
Negative effects of the COVID-19 pandemic on work

Variable	N	M	SD
My working conditions have worsened	179	2.40	1.39
I am thinking of changing jobs	179	2.25	1.52
My salary was reduced	179	2.09	1.36
I had to change jobs	179	1.72	1.27

Note: N – number of respondents; M – arithmetic mean; SD – standard deviation

Source: Authors

On a scale from 1 (I absolutely disagree) to 5 (I fully agree), respondents evaluated the negative effects of the COVID-19 pandemic on their business performance. The majority of respondents (88.80%) did not lose their jobs during the COVID-19 pandemic due to the negative consequences of the pandemic on companies. However, on average, the respondents say that their working conditions have worsened, they are thinking of changing

jobs, their salary has decreased, and they had to change jobs, with the more pronounced view being that the working conditions have worsened as a negative consequence of the COVID-19 pandemic (Table 6).

On a scale from 1 (measures were very bad) to 5 (measures were excellent), respondents evaluated the measures taken by the Serbian Government to mitigate the negative consequences of the COVID-19 pandemic on companies and the economy, the employed and the unemployed. Respondents believe that the measures taken by the Serbian Government in all the mentioned categories were on the border between weak and average, being more significantly aimed at the economy and the employed than at the unemployed (Table 7). On average, respondents agree that the Serbian Government's measures to mitigate the negative consequences of the COVID-19 pandemic were political and resulted in the collection of political points, while they partially agree that the measures were inadequately planned and implemented, as well as late and untimely.

Table 7

Characteristics of measures taken by the Serbian Government during and after the COVID-19 pandemic

Variable	N	M	SD
Estimating measures taken by the Serbian Government to mitigate the negative consequences of the COVID-19 pandemic on the following categories (from 1 - measures were very bad to 5 - measures were excellent):			
Companies and the economy	179	2.62	1.12
Employed population	179	2.61	1.13
Unemployed population	179	2.52	1.24
Measures taken by the Serbian Government to mitigate the negative consequences of the COVID-19 pandemic were (from 1 - I absolutely disagree to 5 - I fully agree):			
Of a political character and resulted in the collection of political points	179	3.93	1.30
Inadequately planned and implemented	179	3.39	1.19
Late and untimely	179	3.16	1.21

Note: N – number of respondents; M – arithmetic mean; SD – standard deviation

Source: Authors

Table 8 shows that the respondents, on average level, have neutral opinions about the financial aid of the Serbian Government to mitigate the negative consequences of the COVID-19 pandemic and its positive

effect on the citizens of the Republic of Serbia, while they disagree that the financial aid helped them solve some of their financial problems Ivanović et al. (2020) found that 17% of respondents believe that Serbia has enough money to overcome the pandemic COVID-19 crisis.

Table 8

Respondents' opinions regarding financial aid from the Serbian Government to mitigate the negative consequences during the COVID-19 pandemic

Variable	N	M	SD
Financial aid from the Serbian Government to mitigate the negative consequences during the COVID-19 pandemic had a positive effect on the citizens of the Republic of Serbia (from 1 - I absolutely disagree to 5 - I fully agree).	178	3.07	1.33
Financial aid from the Serbian Government to mitigate the negative consequences during the COVID-19 pandemic helped me solve some of my financial problems (from 1 - I absolutely disagree to 5 - I fully agree).	179	2.28	1.43

Note: N – number of respondents; M – arithmetic mean; SD – standard deviation

Source: Authors

According to the research results, respondents agree, on average, that they did not feel confident about adopting and implementing measures by the Serbian Government to mitigate the negative consequences of the pandemic. On a scale from 1 to 5, where 1 means that the respondent absolutely disagrees, and 5 means that they fully agree with the statement that they did not feel confident, the average score is 3.60. The respondents have a slightly better attitude but are still negative regarding confidence in institutions (Government of the Republic of Serbia, President, Parliament, Public Institutions, Healthcare, Education, Police, etc.). The average score is 3.40 on a scale from 1 to 5, where 1 represents absolute disagreement, and 5 represents full agreement with the statement that the respondent has lost trust in the institutions (Table 9). According to Bjeloš & Hercegonja (2022), approximately 40% of respondents believe the Government of Serbia handled the crisis effectively. On the other hand, Turjačanin et al. (2020) found that respondents generally do not trust institutions in Bosnia and Herzegovina regarding COVID-19 measures and their implementation.

Table 9
Respondents' opinions regarding confidence in the adoption and implementation of measures by the Serbian Government and institutions

Variable	N	M	SD
During the pandemic, I did not feel confident about the adoption and implementation of measures by the Serbian Government to mitigate the negative consequences of the pandemic (from 1 – I absolutely disagree to 5 – I fully agree).	179	3.68	1.23
Due to the COVID-19 pandemic, I lost trust in institutions (Government of the Republic of Serbia, President, Parliament, Public Institutions, Healthcare, Education, Police, etc) (from 1 – I absolutely disagree to 5 – I fully agree).	179	3.40	1.32

Note: N – number of respondents; M – arithmetic mean; SD – standard deviation

Source: Authors

Table 10
Respondents' attitudes regarding the effects of the COVID-19 pandemic on health and lifestyle

Variable	N	M	SD
The COVID-19 pandemic has forever changed the way people live (remote work, travel, distance education, healthcare) (from 1 – I absolutely disagree to 5 – I fully agree).	178	4.09	1.05
Due to the COVID-19 pandemic, I am more afraid for my health and that of my family (from 1 – I absolutely disagree to 5 – I fully agree).	178	3.54	1.29
The COVID-19 pandemic had a negative impact on my mental state (nervousness, fear, panic, etc) (from 1 – I absolutely disagree to 5 – I fully agree).	179	3.02	1.39
I believe that after the end of the COVID-19 pandemic, I will not be able to continue with a normal life (from 1 – I absolutely disagree to 5 – I fully agree).	178	2.27	1.29

Note: N – number of respondents; M – arithmetic mean; SD – standard deviation

Source: Authors

Table 10 shows respondents' attitudes regarding the effects of the COVID-19 pandemic on health and lifestyle. On average, respondents agree that the COVID-19 pandemic has changed the way people live (remote work, travel, distance education, health care) and say that they fear more for their health and the health of their families because of the COVID-19 pandemic. On average, respondents express neutral attitudes regarding the negative impact on their mental state (nervousness, fear, panic, etc.), while they disagree with the view that after the end of the COVID-19 pandemic, they will not be able to continue with a normal life.

The research below examines the differences in attitudes among various respondent categories using the Kruskal-Wallis test. This test was used to examine the differences between the attitudes of respondents of different age groups regarding the Government's measures and the long-term consequences of the COVID-19 pandemic. The tests showed the following statistically significant results:

- 1) Judging by age groups, regarding the attitude that the measures of the Serbian Government to mitigate the negative consequences of the COVID-19 pandemic were of a political nature and resulted in the accumulation of political points, ($\chi^2_{(4)} = 20.69, p < 0.001$), respondents aged from 30 to 40 are the most likely to believe that the measures were of a political nature and resulted in the collection of political points, followed by respondents aged 20 to 30, while respondents over 60 years of age least agree with this statement.
- 2) With regard to the opinion that financial aid from the Serbian Government to mitigate the negative consequences during the COVID-19 pandemic had a positive effect on the citizens of the Republic of Serbia, ($\chi^2_{(4)} = 20.47, p < 0.001$), respondents over 60 years of age agree the most with this statement, followed by respondents aged 20 to 30, while respondents aged 30 to 40 agree the least with this statement.
- 3) Regarding the opinion that financial aid from the Serbian Government to mitigate the negative consequences of the COVID-19 pandemic helped them solve some of their financial problems, ($\chi^2_{(4)} = 40.89, p < 0.001$), respondents over 60 agree the most, while respondents aged 30 to 40 agree the least with the above statement.

- 4) Regarding the attitude that during the pandemic, they did not feel confident about the adoption and implementation of the measures taken by the Serbian Government to mitigate the negative consequences of the pandemic ($\chi^2_{(4)} = 12.01$, $p = 0.017$), respondents aged 30 to 40 most agree with the above statement, followed by respondents aged 50 to 60 and older than 60, while respondents aged 40 to 50 least agree with this statement. Kalleose et al. (2023) found that respondents from Denmark and Sweden, 65 years or younger, expressed less trust in government measures than those older than 65.
 - 5) Regarding trust in institutions (Government of the Republic of Serbia, President, Parliament, Public Institutions, Healthcare, Education, Police, etc.), respondents aged 30 to 40 lost the most trust, and respondents older than 60 the least ($\chi^2_{(4)} = 32.68$, $p < 0.001$).
 - 6) Among the age groups, regarding the attitude that due to the COVID-19 pandemic, they are more afraid for their own and their family's health, ($\chi^2_{(4)} = 13.65$, $p = 0.009$), respondents over 60 agree with this statement the most, while respondents aged 30 to 40 agree the least. Pajvančić-Cizelj, Čikić, and Ristić (2020) also found that older respondents (aged 56-64 and 65 years and older) in Serbia agree that they are afraid for themselves and their families.
 - 7) Regarding the inability to continue a normal life after the pandemic, respondents over 60 most agree that they will not be able to continue a normal life after the COVID-19 pandemic, while respondents between the ages of 50 and 60 agree the least with this statement, ($\chi^2_{(4)} = 27.97$, $p < 0.001$). The results are similar to those of Pajvančić-Cizelj, Čikić and Ristić (2020), who found that respondents older than 65 years strongly agree that the COVID-19 pandemic has drastically changed their lives.
- consequences of the COVID-19 pandemic were of a political nature and resulted in the collection of political points. On the other hand, pensioners are least likely to agree with this statement ($\chi^2_{(3)} = 16.03$, $p = 0.001$).
- 2) Pensioners most agree with the statement that financial aid from the Serbian Government to mitigate the negative consequences during the COVID-19 pandemic had a positive effect on the citizens of the Republic of Serbia, while employed respondents least agree with this statement ($\chi^2_{(3)} = 23.19$, $p < 0.001$). Jovanović, Đukić and Ajvazović (2021) also found that financial support from the Serbian Government was particularly important to pensioners.
 - 3) Additionally, pensioners most agree with the statement that financial aid from the Serbian Government helped mitigate the negative consequences of the COVID-19 pandemic, alleviating some of their financial problems, while employed respondents least agree with this statement ($\chi^2_{(3)} = 39.61$, $p < 0.001$).
 - 4) Due to the COVID-19 pandemic, unemployed respondents lost the most trust in institutions (Serbian Government, President, Parliament, Public Institutions, Healthcare, Education, Police, etc.). On the other hand, pensioners lost the least trust in institutions ($\chi^2_{(3)} = 12.29$, $p = 0.006$).
 - 5) Due to the COVID-19 pandemic, pensioners are the most afraid for their own and their family's health, while unemployed respondents are the least afraid for their own and their family's health ($\chi^2_{(3)} = 11.68$, $p = 0.009$).
 - 6) As in the previous situation, pensioners most agree with the statement that after the end of the COVID-19 pandemic, they will not be able to continue with a normal life, while employed respondents least agree with this statement ($\chi^2_{(3)} = 31.72$, $p < 0.001$).

Concluding Remarks

The Kruskal-Wallis test was also used to examine differences in attitudes toward the Government's measures and the long-term consequences of the COVID-19 pandemic among respondents of different employment statuses. The results show statistically significant differences regarding the following statements:

- 1) Unemployed respondents mostly agree with the statement that the measures taken by the Serbian Government to mitigate the negative

Based on the above, it can be said that no country in the world was ready to respond adequately to the negative effects of the COVID-19 pandemic. Most countries have adopted economic measures to mitigate the negative effects of the pandemic and to help citizens and the economy. Those measures had different impacts, and many factors influenced the effectiveness of those measures (economic development of the country, political situation, citizens' trust, etc.). This paper analyses the citizens' attitudes related to the

effectiveness of economic measures implemented by the Serbian Government during the COVID-19 pandemic.

Analysis of research results points to the following conclusions. First of all, the majority of respondents believe that the Republic of Serbia was not ready to adequately deal with the consequences of the COVID-19 pandemic, similar to other countries. The economic sectors most affected by the pandemic were, in the opinion of Serbian citizens, the tourism and hospitality sectors, followed by the production and transport sectors. Most respondents did not lose their jobs due to the impact of the COVID-19 pandemic, but their working conditions worsened. Respondents mostly believe that the Government's measures had an impact on the economy, but that they were primarily political and were used to score political points. Also, respondents believe that the Government's measures did not solve the financial problems that arose during the pandemic. Citizens have shown that they have little trust in government measures and institutions themselves, and in how they deal with crises. The respondents were quite neutral regarding their psychological state after the pandemic and the possibility of continuing a normal life. Care should be taken here because the attitudes by age categories differ, so older respondents are more concerned about the health consequences of the pandemic.

What should be emphasised is that, if observing the respondents' age structure, as the age of the respondents

increases, the trust towards the Government's measures also increases. The fear of long-term consequences of the pandemic is more pronounced among the elderly population. The unemployed are the most dissatisfied with the measures taken by the Serbian Government regarding the elimination of the pandemic's consequences.

The conclusion that emerges is that the measures could have been more selective and aimed at the middle-aged population and the unemployed, which is also a recommendation for future crises. The greater targeting of measures towards the population that makes up the working class stems from the fact that their position is much more uncertain in crisis conditions, such as the COVID-19 pandemic crisis, which is why they require larger aid.

The survey includes 179 respondents, so generalising the results is not recommended. Furthermore, most questions and answers are based on rating certain statements on a scale from 1 to 5. Therefore, the respondents' answers are based on their subjective assessment. Given that the answers were obtained via an online tool and the survey was anonymous, the influence of subjectivity is reduced. However, there is a social desirability bias. Future research should include a larger sample of respondents and a qualitative analysis of citizens' views on economic measures to mitigate the consequences of the COVID-19 pandemic in the Republic of Serbia.

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Analiza stališć državljanov do ekonomskih ukrepor za odpravo posledic pandemije covid-19 v Republici Srbiji

Izveleček

Pandemija, ki jo je povzročil virus covid-19, je povzročila negativne ekonomske posledice v vseh državah. Pandemija covid-19 je ustvarila težave pri delovanju gospodarstva, zato so bili potrebni ukrepi ekonomske politike za zmanjšanje negativnega vpliva pandemije. Vsaka država na svetu je skušala najti najboljše ekonomske ukrepe, s katerimi bi svojim državljanom čim bolj olajšala premagovanje negativnih učinkov pandemije. Po petih letih od začetka pandemije je mogoče veliko bolj objektivno oceniti dejanske učinke teh državnih ukrepor, ki jih je izvajala tudi Vlada Republike Srbije, kar je predmet analize v tem prispevku. Primarni cilj tega prispevka je oceniti mnenja državljanov o učinkovitosti ekonomskih ukrepor države, ki jih je izvajala Vlada Republike Srbije za ublažitev vpliva pandemije na življenja državljanov in delovanje podjetij.

Ključne besede: ukrepi ekonomske politike, pandemija covid-19, anketa, anketiranci

Establishing a Digital Participation Bank in North Macedonia: Opportunities and Challenges in Interest-Free Finance

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Abstract

This paper aims to explore the feasibility of establishing a digital participation bank in North Macedonia based on the principles of interest-free finance. This system has been part of ethical and equitable financial systems in the major Abrahamic religions. Thus, as interest-free finance becomes more popular worldwide, digital banking presents a new approach to incorporating these principles into the Macedonian banking system. Here, the purpose of the paper is to discuss the applicability of establishing a digital participation bank in North Macedonia based on interest-free finance principles, by drawing on global best practices. In that sense, this paper provides an analysis of the interest-free finance and intends to describe the banking environment in North Macedonia and the necessary regulatory and market changes. Furthermore, it offers recommendations for integrating ethical, interest-free finance into the Macedonian digital banking sector. Findings indicate that the country has strong potential, due to its diverse population, growing SMEs sector and demand for ethical financial services, but at the core, significant legal and institutional changes are required. Finally, the paper concludes with the opportunities that digital interest-free finance has in financial inclusion, investment attractiveness, and integration with the digital transformation strategy; while detected challenges refer to regulatory changes, consumer and institutional education.

Introduction

Interest-free finance, an ethical finance model that prohibits interest and is viable globally, originated from traditional systems and is historically practised in Abrahamic faiths. This model encourages risk sharing, real asset-based transactions, and social responsibility (Visser 2009; Saleem et al., 2013). Its success is evident in Türkiye, Bosnia and Herzegovina, and parts of Europe, where participation banks thrive in supportive regulatory environments, with Türkiye's government being a key driver (Derbel et al., 2011).

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The universality of the global success of digital banking in the interest-free finance sector is proven by its imitation all over the world. The UK has emerged as a leader in ethical finance, with Al Rayan Bank offering a range of interest-free products, including Sukuk Islamic bonds for infrastructure projects. These institutions have been able to cater to a diverse clientele, including non-Muslims, with regulatory support. The success of sukuk issuance shows that interest-free finance is compatible with the Western regulatory systems and thus could be a viable alternative for socially responsible investment (World Bank, 2017).

The market for interest-free finance has a niche audience in Germany, and this niche is focused on sustainability and ethical investing. Some financial institutions in Germany incorporated principles of responsible investing that are consistent with the principles of interest-free finance, which include the avoidance of exploitative industries. Although interest-free finance is still a small part of the market, it is appealing to ethically conscious consumers who are looking for transparent and sustainable financial products (Apaydin, 2021).

In South Africa, FNB Islamic banking shows that interest-free finance can easily be adopted in a multi-faith and secular environment. Furthermore, South Africa's regulatory framework has been very efficient in facilitating the growth of interest-free financial products, thus becoming an example of how to incorporate them into multicultural markets (Gündoğdu, 2018).

The Canadian model of interest-free finance shows that the model is flexible enough for secular and multicultural societies. Canadian financial institutions have focused on ethical investments and community-driven financing models as they expand their appeal to socially conscious consumers (Credit Union Central of Canada, 2012).

Additionally, the experience of Türkiye shows that using digital channels extends the coverage of interest-free financial services to more people and provides ethical finance to the unbanked (Abdul-Rahman, 2014). From this point of view, interest-free finance has great potential for North Macedonia and other Balkan economies when combined with digital banking (Abdul-Rahman, 2014; Visser, 2009). Therefore, this paper aims to explore the feasibility of establishing a digital participation bank in North Macedonia based on interest-free finance principles. The research methods include analysis of the current banking landscape, regulatory environment, and market readiness, with a focus on integrating digital banking and interest-free finance in

North Macedonia. The discussion in this paper is focused on the distinction between religious motivations and universal ethical finance logic, emphasizing SME support, and sustainable banking innovation, while the content is structured around the applicability of interest-free finance in North Macedonia, the setting of the Macedonian banking sector, in terms of its legal framework and Fintech emergence, and finally elaborates on the establishment of digital participation bank and its socio-economic impact.

Applicability of Interest-Free Finance in North Macedonia

Globally, there is a rising awareness and demand for ethical and interest-free financial products that emphasise transparency, social responsibility, and sustainable development. Interest-free finance models, such as mudarabah (profit-sharing) and musharakah (joint venture), appeal not only to religiously observant consumers but also to ethically conscious individuals, SMEs, and investors. These models align with modern principles of stakeholder capitalism and inclusive finance. In that sense, according to Halal Times (2024), *“the surge in popularity of interest-free banking can be attributed to its ethical approach and the increasing awareness and demand for Shariah-compliant financial products, as a response to the needs of Muslims who want to manage their finances in a way that is consistent with their religious beliefs, as well as non-Muslims who seek ethical banking alternatives”*. Although Islamic finance has popularised these practices, their implementation in countries like the UK, Canada, and South Africa shows that religious affiliation is not a prerequisite for adoption. In these environments, regulatory innovation and ethical consumer behaviour have driven the demand. For the purpose of clarifying the conceptual distinction and overlap between Islamic and Interest-free finance, Table 1 summarises their key differences.

Table 1
Distinction between Islamic Finance and Interest-Free Finance

	Islamic Finance	Interest-Free Finance
Definition	Financial system based on Shariah Law, which is characterised by – prohibition of Riba, Gharar, and Maysir; avoidance of trade in unlawful goods	An alternative to an interest-based financial system that eliminates the interest, but does not necessarily follow Shariah Law

Continuation of Table 1

Distinction between Islamic Finance and Interest-Free Finance

	Islamic Finance	Interest-Free Finance
	and services; and follows the principles of justice and equity.	or religious principles.
Core principles	Profit and loss sharing, asset backing, ethical investments and religious compliance.	Economic ethics, transparency and social responsibility, secular in foundation
Scope	Banking, capital markets (eg, Sukuk), insurance (takaful), leasing, investments.	Banking, investment
Governance and Compliance	Oversight by Shariah Boards, responsible for overseeing activities and introducing financial products.	Governed by ethical codes, regulations, binding contracts or membership in alliances, such as the Global Alliance for Banking on Values. (No Shariah compliance needed.)
Products and instruments	Mudarabah; Musharakah; Bai' al-Salam (prepayment financing); Qard al-Hasan; ijarah; takaful etc.	Profit and loss sharing (Mudarabah, musharakah), prepayment financing, equity-based lending, community finance, microfinance, i.e. zero-interest loans or group lending for low-income borrowers
Users	Muslims, ethical investors	Ethically motivated users, socially conscious investors, and cooperatives
Examples of financial institutions	Al Rayan Bank, Islamic Development Bank, etc.	Triodos Bank, cooperative credit unions, and P2P lending platforms with zero-interest lending models

Source: Authors

In North Macedonia, the demand for interest-free finance products could be driven by: i) the consumers and businesses looking for ethical banking options, and ii) the attraction of foreign investors from countries where interest-free finance is prevalent. This depends mostly on North Macedonia's diverse population with a significant Muslim community, which might be more inclined towards interest-free financial products due to religious beliefs. Secondly, the country's economic landscape is characterised by a growing SME sector and increasing foreign investments, and contracts like *mudarabah* or *musharakah* can provide vital support to SMEs by encouraging entrepreneurship, the establishment of new companies and finally, contributing positively to economic growth and job creation.

Given the similarities that exist between Islamic and interest-free finance, the closest research done in the area of interest-free finance in North Macedonia is the research conducted by Abdullahi & Shaharuddin (2016), which investigated the potential for introducing Islamic banking services into North Macedonia's existing banking system. This research showed that 68.4% (out of 500 respondents in Tetovo-N. Macedonia) believed bank interest is unethical, reflecting a strong understanding of the prohibition of interest (Riba). Additionally, 92.8% of respondents indicated they would use Islamic banking services if available through an Islamic banking window, highlighting significant demand. Moreover, 74.4% agreed that nationwide Islamic banks would attract users, showing significant support for such services. These findings show that in North Macedonia, there exists a public interest in ethical banking finance models, firstly driven by the desire for greater transparency, accountability, and social responsibility in financial practices. These practices can be seen to align banking activities with broader societal values, enhancing trust in financial institutions and contributing to sustainable economic development (European Investment Bank, 2024). Additionally, the development of the Fintech sector can contribute towards the transformation of the banking industry, enabling conventional banks to integrate many ethical practices into their value chains.

Despite its appeal, interest-free finance remains underdeveloped in North Macedonia due to its conventional banking infrastructure. However, given the previous evidence, there is a potential for integrating interest-free finance, but the regulatory framework would need adjustments to accommodate Sharia-compliant financial products. This includes the

establishment of regulations that allow for interest-free financial products, such as profit-sharing (*mudarabah*) and joint venture (*musharakah*) contracts. At the same time, interest-free transactions require specific taxation and accounting standards. For instance, regarding taxation, interest-free transactions should not be disadvantaged when compared to conventional ones, or, for example, in the case of *murabaha* contracts (where the same asset is sold and resold), to avoid double taxation. In profit and loss sharing arrangements (like *mudarabah*), the capital provided by the Rab-ul-Mal is recorded as an investment while crediting the cash item. Afterwards, profits are recognised when earned and distributed according to the agreed ratio, debiting the Cash, and crediting the Mudarabah profit (Mia, 2016). In a nutshell, the regulatory changes would require greater transparency of the terms and conditions of interest-free financial products to ensure that consumers understand the profit-sharing and risk-sharing mechanisms and modification of consumer protection laws that address the specific risks related to them.

Current Banking Landscape in North Macedonia

The banking system of the country is still quite traditional and does not include many practices of interest-free finance. In its process of modernisation of the economy and integration into the European Union, the country could use a digital participation bank that would expand the range of services and attract customers who are concerned with the ethical aspects of the company's activity (Derbel et al., 2011). The experience of Bosnia in the use of interest-free finance can be followed, and the practice of Türkiye in the use of participation banks and their development, including the use of technology. Such an initiative can help North Macedonia to align with the global standards of ethical financial practices and can also contribute to the overall economic and social development.

North Macedonia's financial system is bank-based, characterised by banks' significant role in financial intermediation and economic activities. Banks are the primary financial intermediaries, holding about 80.4% of the total assets in the financial system (NBRNM, 2024). Moreover, given the stage of financial development that corresponds with economic development, it means that

Macedonian banks are primarily focused on commercial banking activities, i.e., they follow a traditional banking model. The predominant source of funding for banks is deposits, derived from the domestic private sector and accounting for approximately 80% of their liabilities, highlighting the substantial confidence that the Macedonian population places in these financial institutions. (NBRNM, 2024). Additionally, their loan portfolio is almost evenly split between households and corporate loans, giving a small preference for households since it enables lower credit risk and better portfolio diversification (EBA, 2021).

While traditional banking practices dominate, there is a growing shift towards digital transformation. Banks are increasingly adopting digital technologies to enhance their service delivery and operational efficiency and better meet customer needs. According to findings by Stanoevska et al. (2023), digitalisation is a major challenge for the Macedonian banking system, driven by new payment regulations and competition from fintech providers. Banks often view fintech as a cost rather than a benefit, or as a complementary partnership that can give advancement in their operations. Banks need to adopt new technologies and manage associated risks to financial resilience, inclusion, and consumer privacy. Empirical evidence shows that Macedonian banks are digitising in several areas, such as digital identity services, digital payment methods, online account management, mobile banking applications, and online lending applications. This emphasises the need for traditional banks to innovate and invest in digital solutions when offering financial services, reinforcing the statement that the banking sector still lacks significant competition from fintech companies (Danevska, 2020). Fintech companies are companies that use technology in the areas of banking services, payments, data analysis, capital markets and financial management (Huang, 2015). National Bank's study of 2020 showed the absence of entirely new fintech business models, such as digital-only challenger banks or equity-based crowdfunding platforms. Even today, the fintech environment does not recognise these kinds of digital banks or crowdfunding platforms in North Macedonia. What can be noticed in the current financial industry, in terms of non-bank financial companies, is the operation of fintech companies in the areas of risk assessment, credit scoring, lending, and investing (Table 2).

Table 2
Examples of non-bank financial companies in North Macedonia that use advanced technology

Examples of non-bank financial companies utilising advanced technologies	Advanced technology and application
<i>Tigo Finance Macedonia</i>	Uses advanced algorithms for quick loan approvals and risk assessment.
<i>lute Credit</i>	Implements digital platforms for loan applications and customer service, making the process more efficient.
<i>Credissimo</i>	Using AI and machine learning to streamline loan processing and improve customer experience.
<i>Mogo Finance Macedonia</i>	Utilises technology for vehicle financing, including online applications and automated credit scoring.
<i>Factor Trust</i>	Employs big data analytics to provide alternative credit data and improve credit reporting
<i>Blockchain EcoToken</i>	Leverages blockchain technology for secure and transparent crowdfunding

Source: Authors' research

This is largely due to the delayed adoption of an evolving regulatory framework, where significant steps and actions should be taken to support the growth and integration of fintech companies in North Macedonia, which will support innovation and growth in the financial sector. Currently, fintech companies are subject to the same regulations as traditional financial services, with no special regime specifically for fintech. However, the Payment Services and Payment Systems Act, effective from January 2023, aligns with EU directives and aims to modernise the payment services industry, facilitating the entry of new fintech providers. Additionally, the National Bank of the Republic of North Macedonia has developed a Fintech Strategy for 2023-2027, focusing on technological innovation, regulatory alignment, and financial inclusion. Additionally, the country is considering a regulatory sandbox model to support fintech innovation, particularly in cryptocurrencies. Recent reforms in regulatory frameworks, including the amendments to the Company Law, also aim to simplify business operations and

enhance the competitiveness of the fintech sector. This is expected to further push the development of the fintech sector and, more importantly, to significantly influence the business models of traditional banks (Danevska, 2021).

On the other hand, Fintech companies can strengthen ethical banking practices, such as interest-free financial products, by promoting financial models that emphasise positive societal impact. By analysing real-world examples (such as those of Challenger Bank Triodos UK), it can be noted that fintech companies demonstrate considerable maturity and expertise in leveraging their innovations to adhere to ethical principles (Danevska, 2024). Furthermore, these examples can also be used as guidance for traditional banks in the manner of forming mutually beneficial relationships, particularly in impact investment, raising awareness of ethical financial practices, promoting sustainable behaviour among all stakeholders, and even interest-free financing.

Establishing a Digital Bank with Interest-Free Finance in North Macedonia

The establishment of a fully digital bank with interest-free products in North Macedonia first requires implementing many changes in the regulatory environment. This involves collaboration between the government, regulatory bodies, financial institutions, and the community to ensure a smooth transition and successful adoption of digital and interest-free finance.

In the case of the establishment of a digital bank, North Macedonia can follow the case of the United Kingdom, as a leader in the global digital banking industry. Many of the UK's digital banks initially started as fintech companies, primarily offering payment services, and over time, as they grew and demonstrated their capabilities, they applied for and were granted full banking licenses (Mbama and Ezepue 2018). For example, Monzo and Revolut began as Fintech startups granted e-money licenses, enabling them to provide payment solutions, prepaid cards, and currency exchanges. Later, they expanded their services and obtained banking licenses to offer a broader range of financial products. This approach allowed them to build a customer base and refine their technology before taking on the full regulatory responsibilities of a bank.

According to the new Law on Payments and Payment Systems (90/2022 and the Amendments from 64/2024), which was aligned with the newest EU PSD2 directives, e-money institutions can provide services in the area of

payments, issuing e-money, managing payment systems, and currency exchange. The funds received by payment institutions and e-money institutions from payment service users do not constitute deposits or other repayable funds (Article 15, paragraph 2). Additionally, according to the same article, point 4, the issuer of electronic money is not allowed to calculate or pay interest or offer any other benefit during the period in which the holder of the electronic money retains the electronic money. Regarding the issuance of credits, according to the Article 12: "A payment institution or an electronic money institution may approve a credit line related to the payment services if: i) The credit line is auxiliary and approved solely to execute payment transactions; ii) The credit granted for providing payment services in the territory of a third country is repaid within a period not exceeding 12 months; and most importantly iii) the credit line *is not approved from the funds received or held for executing payment transactions, nor from the funds received in exchange for issued electronic money that are held* by Article 32 of this law; and when concluding and implementing the credit line agreement, the provisions of the Consumer Protection Law regarding consumer credit agreements are appropriately applied."

So, in terms of regulatory requirements for being bank-chartered, the transitioning of Macedonian fintech from an e-money license to a full banking license would involve several challenges and restructuring of the company that includes: an increase in initial capital (from 7.800.000,00 denars to 310.000.000,00 denars), preparation of detailed business plans, risk management frameworks that follow internal acts and decisions of the National Bank, related to credit, market and operational risk, acquiring licenses and approval for bank's key personnel, upgrades to IT systems and operational infrastructure for a broader range of financial banking services (including collecting deposit and lending) and finally participation in the Fund for deposit insurance, ensuring that retail and sole proprietors' deposits are protected up to a certain amount. Furthermore, a bank in North Macedonia can be established as a joint stock company, while for comparison in the UK, Monzo is a private limited company.

On the other hand, the introduction of interest-free financing in North Macedonia, currently cannot occur under the Law on Banks, whereby Article 2, point 23 states "Credit is the provision of a certain amount of money in exchange for the repayment of the approved and outstanding amount, together with interest or together with interest and fees calculated on that amount." However, according to the Law on Financial

institutions article 3, point 3, "*credit is the provision of a certain amount of money in exchange for the repayment of the approved and outstanding amount, together with the interest and/or fees calculated on that amount.*" This definition is closer in practice to what a Sharia-compliant bank – for example, Al-Rayan Bank UK charges for financing a residential investment in the form of rent payments or profit charges (referring to the agreement Ijarah, i.e., leasing). This type of mortgage is used both for financing a house purchase and for existing homeowners switching from an interest-bearing mortgage. (HM Land Registry, 2023). Additionally, in the case of interest-free financing, Monzo offers and buy now, pay later (BNPL) service that allows customers to extend the cost of purchases over three months with no interest, for purchases between £30 and £3,000.

These examples illustrate that the UK provides a supportive environment for both digital banks and interest-free financial products. This is based on a robust regulatory framework that ensures that interest-free financial products are accessible. These laws also align with EU directives that accommodate both bank and non-bank financial institutions offering Sharia-compliant financial products, conventional and alternative interest-free finance models.

Therefore, from legal aspect, the establishment of a digital interest-free bank in North Macedonia would require amendments in the Law on Banks (by taking into consideration the means of repayment and the operation of a digital-only bank), or this entity might be established as non-bank financial institution where its products and services would comply with an upfront defined values framework, or guiding principles, or certified by a Shariah board or committee (Emirates Institute of Finance, 2025).

Potential Economic and Social Impacts

Interest-free finance has the capacity to change the world by promoting financial inclusion, ethical banking, and the development of small and medium enterprises. In this regard, a digital participation bank based on interest-free finance could be a solution for SMEs in North Macedonia to get alternative financing that will help them to grow and create new products and services while observing the ethical principles in business. Some examples of interest-free financing products include mudarabah, which is profit sharing, and musharakah, which is a joint venture, as alternatives to traditional loans that come with interest rate payments and, therefore, do not make the client's business incur debt and grow. These arrangements guarantee that the financier and the

business owner share both the risk and reward in the business, and this is done in a way that is more conducive to the risk taken in new and emerging enterprises (Ahmed, 2002).

The use of interest-free finance also increases financial inclusion, as the SMEs who may not be willing to get financing from conventional interest-bearing channels can be reached. In North Macedonia, where SMEs are important for growth and employment, interest-free finance can help break the barriers to credit for the smaller firms. Interest is, therefore, excluded from the transactions, which makes the participation banks to provide more affordable financing options that are consistent with the business owners' ethical values, especially those who may not want to get financing from interest-bearing sources for cultural or religious reasons (Ali & Al-Owaihian, 2008).

In addition, the digital infrastructure of a participation bank can improve the availability of financial services in the unserved areas of North Macedonia, including SMEs and individuals who cannot easily access the conventional banking system. Interest-free financial services can be provided to a large extent through mobile and online platforms, and SMEs in rural and remote areas can also be able to access the necessary funds for business growth. This digital strategy promotes a more inclusive financial system in which entrepreneurs can embrace the principles of ethical finance. This integration with ethical finance will further enhance the competitive standing of the North Macedonian SMEs in the regional as well as international markets because consumers would be more conscious of buying from companies that are socially responsible and environmentally friendly (Ali & Al-Owaihian, 2008).

North Macedonia can also use the principles of interest-free finance to develop new and innovative funding models, such as crowdfunding, B2B, B2C, and C2C

funding. These models also follow the principles of interest-free finance as they are based on direct investment in tangible projects and community-based funding. For example, profit-sharing arrangements in crowdfunding can increase public engagement by allowing backers to share in a venture's success, thus leading to beneficial relationships between investors and SMEs. This way, the capacities and capabilities of businesses are enhanced by providing them with a wider pool of ethical investors, often at lower costs than from traditional financing methods (Obaidullah, 2008; Ayub, 2007).

Conclusion

From the given case studies in various countries around the world, the regulatory overview and the current state of the financial environment in North Macedonia, the implementation of interest-free finance in North Macedonia is a viable but complicated proposition. The increasing global demand for ethical and/or Sharia-compliant financial services offers a great chance for such products in North Macedonia, especially given that it has a large Muslim population and a rapidly developing SME sector. Based on the overview of the current financial landscape in the Republic of North Macedonia, in terms of the existence of a conventional banking system, the emergence of Fintechs as a catalyst for the establishment of a digital interest free bank and the financial legal framework, the uptake of interest free finance models has its challenges. These challenges call for changes in the legal framework, enabling banks to engage in offering interest-free financing products. Additionally, this would require educating and training financial institutions and regulators' staff. Setting the ground for interest-free financial products enables not only ethical banking products, community financing, SMEs support, but and facilitation of entry of foreign investments that would diversify the offerings of financial products and boost the economic development.

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Ustanovitev digitalne participativne banke v Severni Makedoniji: priložnosti in izzivi brezobrestnega financiranja

Izvleček

Namen tega članka je raziskati izvedljivost ustanovitve digitalne participativne banke v Severni Makedoniji na podlagi načel brezobrestnega financiranja, sistema, ki je del etičnih in pravičnih finančnih sistemov v glavnih abrahamskih religijah. Ker brezobrestno financiranje postaja vse bolj priljubljeno po vsem svetu, digitalno bančništvo predstavlja nov pristop k vključevanju teh načel v makedonski bančni sistem. Namen tega članka je ob upoštevanju najboljših svetovnih praks razpravljati o izvedljivosti ustanovitve digitalne participativne banke v Severni Makedoniji na podlagi načel brezobrestnega financiranja. V tem smislu ta članek ponuja analizo brezobrestnega financiranja in opisuje bančno okolje v Severni Makedoniji ter potrebne regulativne in tržne spremembe. Poleg tega ponuja priporočila za vključitev etičnega, brezobrestnega financiranja v makedonski sektor digitalnega bančništva. Ugotovitve kažejo, da ima država velik potencial zaradi raznolike populacije, rastočega sektorja malih in srednje velikih podjetij in povpraševanja po etičnih finančnih storitvah. Vendar so v osnovi potrebne pomembne pravne in institucionalne spremembe. Članek navaja priložnosti, ki jih brezobrestno digitalno financiranje ponuja za finančno vključevanje, privlačnost za naložbe in integracijo s strategijo digitalne transformacije, medtem ko so ugotovljeni izzivi povezani z regulativnimi spremembami ter izobraževanjem potrošnikov in institucij.

Ključne besede: digitalno bančništvo, brezobrestno financiranje, etično financiranje, digitalna transformacija

Perspectives on Corporate Governance in State-Owned Enterprises: Evidence from Bosnia and Herzegovina, Croatia and Serbia

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Abstract

This paper examines the key aspects of corporate governance of state-owned enterprises (SOEs) through a comparative survey conducted in Bosnia and Herzegovina, Croatia, and Serbia. The research explores two distinct perspectives: the state's view on the necessity and governance of SOEs, and the perspective of SOE boards on operational and strategic challenges. From the state's perspective, the survey addresses issues such as the protection of national economic interests, state ownership in key industries, equitable service provision, and the reinvestment of SOE profits into public projects. Findings suggest a strong alignment among respondents across all three countries, supporting the idea that state ownership ensures economic sovereignty and guarantees fair access to essential services. On the other hand, the board perspective highlights concern about the bureaucratic barriers faced by SOEs, the influence of political interference on financial performance, and the limitations of public ownership in enhancing global competitiveness. Board respondents expressed the need for greater autonomy in decision-making and stressed the importance of partnerships with the private sector to optimise SOE efficiency and market position. The article synthesises these findings to address the broader question: Are SOEs essential in modern economies, or do they require reform to meet contemporary challenges? The results indicate that while SOEs hold strategic importance, reforms focused on reducing bureaucracy, enhancing governance, and promoting public-private partnerships are crucial for their future viability.

Introduction

Until the beginning of the twentieth century, the functions of ownership and management were unified (Fama & Jensen, 1983). However, already in the first half of the twentieth century, a new form of enterprise emerged in which the function of ownership was separated from the function of management (Daily, Dalton, & Cannella,

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2003). This new form was called a corporation. According to Drucker (2003), this "transformed the social and economic structure of the developed countries of the world". Therefore, corporations have undoubtedly been the key generators of the enormous development of the global economy in recent decades. Many authors define the concept of a corporation differently. Monks and Minow (2004) approach the corporation as a means of gathering and organising capital, which enables the production and distribution of goods and services and encourages investment creation. They emphasise that in the concept of a corporation, whether it is a corporation with majority private or public capital, there is an inherent aspiration to continuously increase and maximise the results of its operations, with minimal investments and expenditures.

In addition, corporations, as a new, modern, and institutional form of organising enterprises, have rapidly developed and adapted in the economies of the developed countries of the West (Campbell, Stonehouse, & Houston, 2002). Šunje & Kulović (2019) state that despite the significant wave of privatisation of state enterprises in the 1980s and 1990s worldwide, since the beginning of this century, there has been a growing awareness that the presence of the state and state enterprises in certain industries is critically necessary. Furthermore, the enterprises in state ownership have a significant share in the gross domestic product of developed countries and are believed to already account for about 10% of global GDP (Sturesson, McIntyre, & Jones, 2015). The share of state-owned enterprises (SOEs) in the Fortune 500 increased from 9% in 2005 to 23% in 2014. In support of this claim, research conducted by Belfellah & Bourkha (2016) emphasises that state enterprises are a key driver of economic development, but their efficiency depends on an adequate governance system and state functions. These are precisely the reasons that have conditioned state enterprises to become one of the most significant areas of research, particularly in the field of corporate governance.

Before further elaboration, we will present the definition of state enterprises. Šunje & Kulović (2023) highlight the term *strategic state-owned enterprises* instead of the domesticated term public enterprises. By strategic state enterprises, the authors mean business entities that manage public goods on behalf of the "state" and in which the "state" is the majority owner. Therefore, the analysis of the relationship between ownership and governance is extremely important to uncover the causes of the success of one form of ownership compared to others. SOEs face specific difficulties regarding their

governance, which derive from a complex relationship between state ownership and relevant stakeholders. Overview of corporate governance of state-owned enterprises includes different issues related to the organisation of the ownership function, relationships with non-state shareholders, the role of stakeholders in corporate governance, transparency and disclosure, and the board of directors (OECD, 2005).

Accordingly, the most comprehensive definition of corporate governance was provided by the OECD (2015), which emphasises the structure of complex relationships between (1) top management, (2) its supervisory board, (3) its owners (shareholders), and (4) other stakeholders. Tipurić & Cindrić (2024) note that "the board has legitimising power over managers based on formal corporate governance rules, in a domain defined by law and the company's acts, as well as regulations that clarify this relationship." Shareholders exercise their rights and obligations towards the company as membership rights within the general assembly of shareholders, the supervisory board oversees operations, and the board of directors, as the governing body of the company, performs managerial tasks and represents the company to all internal and external stakeholders, whose interests vary in different legislations. Thus, the board is an internal mechanism of corporate governance linking individuals that provide the capital (owners), individuals exploiting that capital in order to create value (managers) and other stakeholders (Babić, Nikolić, & Erić, 2011). Šunje & Kulović (2019) emphasise that the way certain countries have ensured good governance of state enterprises is by treating state enterprises as corporations which are led by professional and capable managers, not by politicians. It could be achieved through the separation of ownership and management functions, thus placing state enterprises outside the direct control of the ruling political parties. A key step that should be taken in this direction is undoubtedly developing a good corporate governance system through the corporatisation process of state enterprises, especially in post-transition economies.

Based on this point of view, this research explores two perspectives on the necessity and governance of SOE: one that examines the state's perspective and another that examines the board of directors' perspective. Thus, the key research question is related to "two sides of the same coin": *Are state-owned enterprises necessary in modern economies, or do they need reform to respond to contemporary challenges in the governance of SOE.* The paper is divided into three parts. The first part provides a literature review on the key aspects of state enterprises'

governance for economic development. The second part explains the research methodology, while the third part presents the results from the perspectives of the state and board of directors regarding the necessity and governance of SOE. The fourth part discusses the research results with recommendations and limitations. The results indicate the significant role of state enterprises in protecting national economic interests and the public interest. However, the identified strategic and operational challenges indicate that the governance of state enterprises needs to be improved.

Literature Review

Starting from the well-known premise that the character of ownership over certain businesses determines the way they are managed, there is no doubt that key sectors of a country's economy, such as food, energy, water, minerals, transportation, and other similar activities, must have the status of strategic industries where the state must see its opportunity. Although the contemporary trend is for the state to withdraw from economic functions in terms of conducting activities through its economic entities, the significant role of state enterprises today is indisputable (Vasiljević et al., 2020). As Šunje & Kulović (2019) state, following the experiences of highly developed countries, it is clear that transition countries also need to be present in industries considered public goods, have strategic significance, or enable the realisation of comparative advantages. If they wish to "manage" these resources with due diligence, then state enterprises must be organised following the logic of corporate governance. The above-mentioned approach indicates that corporate governance implies the ways of managing and controlling state enterprises. According to Nikolić & Babić (2019), it could be viewed as part of the wider economic context in which enterprises operate and depend on the legal, regulatory and institutional environment. Also, corporate governance deals with issues related to the role and functioning of the board, differences in the ownership structure and level of owner concentration, protection of owners' interests, rights and responsibilities of stakeholders, disclosure and transparency. Thus, corporate governance is related to the problem of the separation of ownership and control, i.e. it can be understood as a set of internal contracts that define the relations between owners, managers and the board of directors (Nikolić, Erić Nielsen, & Peković, 2022). In addition, for post-transition economies, one of the main challenges could be the underdeveloped institutional infrastructure and legal framework (Babić, Nikolić, & Erić, 2011).

Frye & Iwasaki (2011) conducted an extensive study on the relationship between the state and public enterprises in post-transition economies. They tested three ideas: that the state uses board members to discipline managers, that board members secure rents for the political elite, and that there are tacit agreements between board members and managers to the detriment of the general interest. The results of the study showed that board members in public enterprises often act following the second and third ideas. This means that board members primarily serve the interests of the political elite, ensuring rents, or entering into tacit agreements with managers to the detriment of the general interest. The first idea, that the state uses board members to discipline managers, did not find significant confirmation in empirical data. This indicates the presence of political influence and a lack of accountability in the management of state enterprises in transitional economies. Thus, the results of this research largely confirm the previously stated thesis that the problem of the effective functioning of state enterprises has only been successfully resolved by countries that keep state enterprises sufficiently distant from their governments.

Additionally, it should be noted that the research conducted by Grosman, Okhmatovskiy, & Wright (2016) analysed state control and corporate governance in transitional economies over 25 years. Based on more than one hundred publications, they concluded that mechanisms of state control, such as ownership rights, boards of directors, veto rights, and subsidies, significantly affect corporate governance in transitional economies. The first group of research indicates that these mechanisms can be tools for achieving state interests, while the second group emphasises the challenges arising from the conflict between state control and effective corporate governance. This study provides a comprehensive overview of the effects of state control on enterprise management, indicating the need for a balanced approach to reduce negative impacts and increase efficiency. Babić & Nikolić (2020) state that various factors influence the legal form of state enterprises, such as hierarchical position within the government, method of establishment, purpose, status in the privatisation process, ownership structure, stock market status, participation of financial intermediaries, and exclusive rights guaranteed by the state. Here, it is certainly worth mentioning an interesting thesis presented by Matuszak (2020) in his research, where he states that cultural factors, particularly the dominant religion, had a significant impact on the extent of state ownership in enterprises in post-socialist countries,

while political and economic factors had a less pronounced influence. Kaunda & Theuns (2023) in their research show that corporate governance characteristics significantly affect the performance of state enterprises in the least developed economies. Better performance is associated with more efficient board structures, longer director mandates, reduced state ownership, and lower indebtedness. On the other hand, higher state ownership leads to poorer results, while the presence of civil servants and politically connected directors negatively affects the performance of government-controlled enterprises.

The ownership rights should be centralised or coordinated through appropriate state bodies to ensure consistency and compliance with the legislative framework. In support of this position, we cite the research of Crnković (2023), who particularly emphasises that the advantage of a centralised model is the accountability of state enterprises to one entity, but also the government's ability to effectively monitor and shape a clear policy for managing state enterprises. The centralised model allows for careful fiscal oversight, enabling the government to closely monitor financial results and the management of state enterprises. At the same time, the reporting and oversight system must be well-structured, allowing for regular monitoring of enterprise performance and achievement of strategic goals.

Musacchio, Lazzarini, & Aguilera (2015) emphasise that state enterprises in majority government ownership improve corporate governance through independent boards and more transparent financial reporting, which reduces agency conflict and attracts private investors. However, unfortunately, due to non-transparent and non-standardised reporting, we are unable to provide a unified assessment of their business results. In confirmation of this, Mikael and Mabhungu (2024) emphasise that the lack of a unified reporting approach complicates the assessment of the efficiency of state enterprises, indicating the need for standardisation and integration of various performance metrics. Papac & Kulović (2021) in their research emphasise that corporations with good corporate governance had higher profitability and vice versa, confirming the thesis that it is worthwhile to work on improving the quality of corporate governance. The results of the research contribute to clarifying unclear practices in this domain, providing a basis for improving management and transparency in state enterprises. When the state is a minority shareholder, it leaves management to the private sector at lower costs but retains strategic

influence through veto rights or golden shares, while in some cases, the transformation of state ownership allows for the implementation of a new industrial policy.

Thus, the state should ensure the appointment of qualified members of supervisory boards through active ownership and promote compensation plans that support the long-term interests of enterprises, while avoiding political influence and focusing on strengthening the market competitiveness and efficiency of state enterprises. Such a framework contributes to the professionalisation, transparency, and sustainability of state enterprises in modern economic conditions. Nikolić & Zlatanović (2018) point out that when the state is the majority owner, the strategic goals are often determined by political and social dimensions, such as low product prices or increased employment. Encouraging non-profit behaviour is often a feature of state ownership, i.e. state-owned enterprises often perform poorly in terms of traditional performance measures. On the other side, the state has significant resources and, through active ownership, stimulates socially responsible activities. It means the state, as owner, contributes to strengthening the sustainability of enterprises. Accordingly, the role and necessity of state-owned enterprises from the perspective of corporate governance has a double prism of study: from the perspective of the state and the perspective of the board of directors.

Methodology

Based on the literature review, this paper analyses the key aspects of the necessity and governance of state-owned enterprises in post-transition economies through a comparative pilot study conducted in post-transition economies such as Bosnia and Herzegovina, Croatia and Serbia. This pilot study considers different perspectives as "two sides of the same coin": the state's perspective on the necessity of SOE and the perspective of the boards of directors regarding operational and strategic challenges in the governance of SOE. From the state's perspective, the research addresses issues such as the protection of national economic interests, state ownership in key industries, equitable access to services, and the reinvestment of profits from state enterprises into public projects. On the other hand, the perspective of the boards of directors highlights concerns related to bureaucratic obstacles faced by state enterprises, the impact of political interference on financial results, and the limitations of public ownership in enhancing global competitiveness.

The research sample consisted of a total of 60 respondents, evenly distributed across the countries (Bosnia and Herzegovina, Serbia and Croatia). From each country, 10 representatives of the government, who represented state owners, and 10 members of the boards of directors of state enterprises were selected. This sample structure ensured a balance between the two key perspectives – owners and board of directors – providing an opportunity for a comprehensive analysis. The research was conducted using structured interviews from September 2024 to December 2024. A questionnaire was used for data collection, consisting of five questions for the board of directors and five for government representatives. The questions were designed to examine key aspects of the governance of state enterprises and the level of autonomy of the board of directors in making strategic decisions. The questions for state representatives focused on the political-economic aspects of ownership, while the questions for the board of directors explored the level of autonomy as well as operational and strategic challenges in the governance of SOE. The assessment was conducted using a Likert scale from 1 to 5, where 1 indicated "strongly disagree" and 5 indicated "strongly agree." This scale allowed for a quantitative analysis of the respondents' attitudes and the identification of the degree of agreement or disagreement between the two groups.

The research hypothesis is based on the view that there are differences between the selected countries regarding the socio-economic environment and governance from the perspective of the state, but that there are common characteristics of the corporate governance model that determine the perspective of the board of directors. This combined approach provided comprehensive data for analysing the proposed hypothesis (H1): The perception of the state regarding the necessity of state-owned enterprises in the selected countries will significantly differ, while the perception of the board of directors will not be statistically significantly different. This hypothesis was tested through the analysis of the collected data from the selected countries (Bosnia and Herzegovina, Serbia and Croatia). It provides a basis for a deeper understanding of the role of state enterprises through the perceptions of the owner and board of directors, which allowed for the establishment of three auxiliary hypotheses: H1a: There is a significant statistical difference between the perceptions of the state regarding the necessity of state enterprises in economic development; H1b: There is no significant statistical difference between the perceptions of the board of directors regarding the role

of the state in the governance of SOE, and H1c: The institutional context and economic/political conditions determine the differences in the perspective of the state/board of directors in compared countries.

Results and Discussion

When presenting the results, the data were divided into three groups by the established main and auxiliary hypotheses. In analysing the first auxiliary hypothesis, analysis of variance (ANOVA) was used. Testing was conducted on the differences between the means of the groups, in this case, the perception of the necessity of state enterprises. The results of the analysis of variance confirm that there is a significant statistical difference between the perceptions of the states of Croatia, Bosnia and Herzegovina, and Serbia regarding the necessity of state enterprises in economic development, as shown in table 1.

Table 1

Group Statistics and Consistency Check (ANOVA)

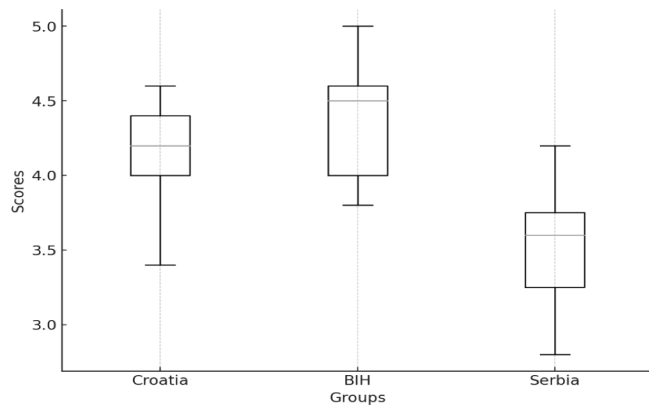
Group	Mean	Standard Deviation
Croatia	4.13	0.353396221
BiH	4.38	0.404969135
Serbia	3.52	0.391010088
F=13.37 (p=0.000091)		

Source: Authors

As presented in Table 1, the calculated F-statistic of 13.37 indicates a significant difference between group means compared to within-group variance. This result is supported by the p-value of 0.000091, which is far below the conventional significance threshold of 0.05, confirming that the observed differences among the three national groups are statistically significant. This suggests that the probability that the observed differences are due to chance is practically negligible. These differences in perceptions indicate specific socio-economic and political factors that shape attitudes in each country.

Croatia and Bosnia and Herzegovina have similar perceptions regarding the necessity of state enterprises, with medians close to the value of four, indicating relatively positive attitudes. In both countries, the responses showed greater consistency, with narrower interquartile ranges suggesting homogeneity of opinion within these groups. On the other hand, Serbia stands out with a lower median and significantly greater variability in responses. Such a distribution indicates a wider range of attitudes among respondents, as illustrated in Figure 1.

Figure 1
Data Distribution for State Perspective: Necessity of State Enterprises



Source: Authors

Thus, as shown in Figure 1, the visual analysis through the box plot further emphasises these differences. Croatia and Bosnia and Herzegovina exhibit similar distribution patterns, while Serbia shows lower minimum values and greater variability, suggesting a diversity of opinions. While Croatia and Bosnia and Herzegovina are close in their attitudes, Serbia clearly differs, with generally lower average ratings. These results are consistent with the understanding that the development of corporate governance institutions in state-owned enterprises in Serbia is one of the priorities in structural reforms, which is why significant efforts were made in the previous period to change the legal regulations.

In addition, Babić & Nikolić (2017) point out the strengthening of institutions as a future imperative. These data highlight the need for a deeper understanding of the local factors that influence perceptions of the necessity of state enterprises in economic development, as these differences may reflect varying economic strategies, political contexts, or cultural patterns in each of the analysed countries. Since $p < 0.05$, the differences among the groups are statistically significant, thereby confirming the first auxiliary hypothesis, i.e. there is a significant statistical difference between the perceptions of the state regarding the necessity of state enterprises in economic development. Furthermore, when analysing the second auxiliary hypothesis, analysis of variance (ANOVA) was also used, which showed that the p-value is 0.214, significantly above the threshold of 0.05, as shown in Table 2.

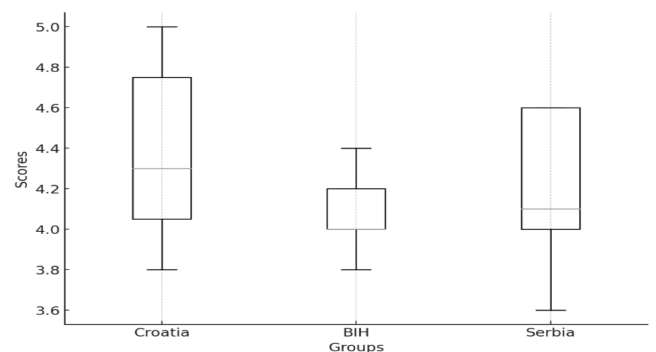
Table 2
Group Statistics and Consistency Check (ANOVA)

Group	Mean	Standard Deviation
Croatia	4.36	0.429987080
BiH	4.08	0.214993540
Serbia	4.22	0.358391468
F=1.63 (p=0.214)		

Source: Authors

This result indicates that the differences in perceptions among the groups, i.e., between Croatia, Bosnia and Herzegovina, and Serbia, are not statistically significant. Therefore, there is no evidence to support the existence of a difference in the attitudes of the boards of directors regarding this issue. The results of the ANOVA analysis provide a statistical framework for understanding the perceptions of the boards of directors regarding the role of the state in the development of state enterprises, but to better visualise the distribution of the data and the differences among the groups, we will present the results in Figure 2.

Figure 2
Distribution for Board Perspective: Role of the State



Source: Authors

Thus, this graphical representation allows for a deeper insight into key statistical elements such as the median, interquartile range, and overall variability of responses, further emphasising the contextual dynamics within and between groups of respondents. Based on the box plot, we can identify patterns and variations in perceptions among the boards in Croatia, Bosnia and Herzegovina, and Serbia, providing a broader perspective alongside the statistical findings. The median for Croatia is the highest among the three groups, indicating a somewhat more favourable perception of the role of the state in the

governance of SOE. Bosnia and Herzegovina have a median close to that of Croatia but slightly lower, while Serbia has the lowest median, suggesting a less favourable attitude.

However, these differences are not pronounced enough to be statistically significant. Analysing the interquartile ranges, Croatia and Serbia show wider variability in responses, meaning there is a greater diversity of opinion among respondents in these countries. On the other hand, Bosnia and Herzegovina has a narrower range, indicating greater consistency of attitudes. A similar pattern can be observed in the minimum and maximum values, where Croatia and Serbia have wider ranges, while Bosnia and Herzegovina show narrower "whiskers," further confirming the homogeneity of responses.

The general distribution of attitudes indicates that Croatia has the most positive view of the role of the state in the governance of SOE, although with greater variability within the group. Bosnia and Herzegovina have a more consistent but somewhat neutral perception, while Serbia shows lower average ratings and greater diversity of opinions, suggesting divided views. Nevertheless, the statistical analysis does not indicate significant differences between these groups, thereby confirming the hypothesis. These results point to similarities in the perceptions of the boards of directors regarding the role of the state in all three countries, which may reflect similar structural challenges or shared regional experiences concerning state governance and economic development. Also, although the degree of development and quality of corporate governance in these countries differ, all three countries apply a corporate governance model similar to the continental European corporate governance model.

Accordingly, the role of internal corporate governance mechanisms, such as ownership structure and board of directors, in these countries is highly significant. The hypothesis that there is no significant difference between the perceptions of the boards has not been rejected, as there are no significant statistical differences between the selected countries Croatia, Bosnia and Herzegovina, and Serbia ($p=0.214$).

Based on the calculated standard deviation for the perceptions of the state and boards (Table 2), the results of the third auxiliary hypothesis are indicated as follows. Regarding the perspective of the state:

- Croatia has a standard deviation of 0.3534, indicating relatively homogeneous perceptions

among respondents. The responses are concentrated around the average value, suggesting that most respondents share similar views on the significance of state-owned enterprises in Croatia. Bosnia and Herzegovina (B&H) has the highest standard deviation (0.4050), indicating a broader range of opinions among respondents. This greater variability may be due to various political and economic factors in B&H, such as political fragmentation and complex institutional frameworks, leading to diverse views on the role of the state in the economy. Serbia has a medium standard deviation (0.3910), suggesting moderate variability in responses compared to Croatia and B&H. While differences in perceptions exist, they are not as pronounced as in B&H.

Regarding the board's perspective:

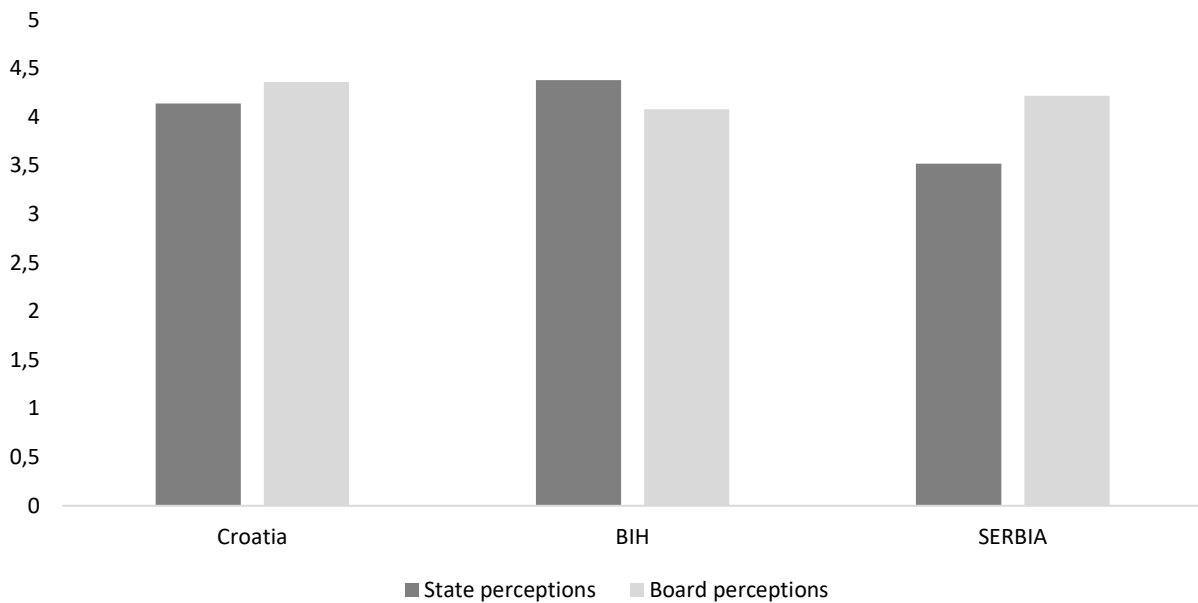
- Croatia shows a standard deviation of 0.4300, indicating a wider range of views among board members in Croatia. This high variability may reflect differing perspectives among board members regarding the autonomy and efficiency of governance in state-owned enterprises. Bosnia and Herzegovina (B&H) has the lowest standard deviation (0.2150), indicating more homogeneous views among board members. This may suggest greater institutional coherence or less divergence in opinions among board members in B&H, possibly due to specific political and economic dynamics. Serbia has a standard deviation of 0.3584, suggesting that board perceptions in Serbia are not entirely homogeneous but are also not as divergent as in Croatia. There is moderate variability in views among board members, which could stem from specific political and economic challenges in Serbia.

The results are demonstrated in the graph below for better insight (Figure 3). The graph shows the average values of perceptions regarding the necessity and role of state-owned enterprises from the perspectives of the state and boards for three selected countries. The results indicate that Croatia and B&H show high and similar average ratings in both perspectives, indicating relatively positive views on the importance of state-owned enterprises in their economies. In Serbia, results show lower average ratings for the state perspective, which may reflect more complex political and economic challenges. However, the boards' perception is

significantly higher, suggesting the possibility of greater autonomy or differing expectations between the state and boards. The presented results confirm the third auxiliary hypothesis. This point of view indicates the

need for deeper research related to institutional context and economic/political conditions that determine the effectiveness of the governance of SOEs.

Figure 3
State and board perceptions about the necessity and role of SOE



Source: Authors

Conclusions and Recommendations

The analysis of the state and board perceptions highlighted two different perspectives regarding the necessity and governance of state enterprises in Bosnia and Herzegovina, Croatia, and Serbia. The results indicate the significant role of state enterprises in protecting national economic interests and the public interest, ensuring equitable access to essential services, and supporting sectors of strategic importance. However, the identified challenges—such as administrative barriers, political influence, and the need for greater autonomy and a reward system—emphasise that the management of state enterprises needs to be corporatised to fulfil their purpose in modern economies. The differences in attitudes among the selected countries indicate the need to tailor reform efforts to specific socio-economic and political contexts. Such results require a balanced approach that retains state ownership in key sectors while simultaneously promoting modern corporate governance practices, including transparency and accountability.

These findings can be interpreted in the broader context of post-transitional economies where the issue of state ownership remains crucial for national economic policy. These results can serve as an argument for maintaining state ownership in certain sectors, particularly in areas of strategic importance, such as energy, transportation, and natural resources.

The high level of agreement among state representatives and the board regarding the strategic importance of state control indicates the need to preserve state ownership in strategic sectors, as well as the potential for further collaboration between the state and board to enhance efficiency and transparency. However, the analysis also suggests potential differences in the homogeneity of opinions within the groups, which may indicate specific challenges related to management or the political context in individual countries. In addition to the above-mentioned implications, it should be highlighted that this is a pilot study, which can be very important before conducting a full-scale research project, helping design the research methods. The limitation of this pilot study is

the size of the sample and the question of the generalizability of the conclusions.

Although numerous studies in this area are related to the implications of state control from the corporate governance perspective in transition economies, the conclusions regarding the understanding of different corporate governance mechanisms of state-owned enterprises are still heterogeneous. These results provide a foundation for further research that could deepen the understanding of the relationship between state owners and management, taking into account various institutional and economic factors. Additionally, they provide arguments for the further development of

policies that balance national interests, market demands, and the need for more efficient management in state enterprises. The future research directions will be based on the more extensive empirical research and comparative analysis, which could offer some general guidelines for the improvement of the corporate governance model and strengthening the role of state-owned enterprises. Elucidating the role of the state as the majority owner in the global economic environment in order to reduce the negative consequences of the economic crisis and strengthen the institutional environment is a necessary assumption for improving corporate governance in the transition economies.

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Perspektive korporativnega upravljanja v državnih podjetjih: primeri iz Bosne in Hercegovine, Hrvaške in Srbije

Izvleček

Ta članek preučuje ključne vidike upravljanja državnih podjetij na podlagi primerjalne raziskave, izvedene v Bosni in Hercegovini, na Hrvaškem in v Srbiji. Raziskava proučuje dve različni perspektivi: stališče države o nujnosti in upravljanju državnih podjetij ter stališče upravnih odborov državnih podjetij o operativnih in strateških izzivih. Z vidika države raziskava obravnava vprašanja, kot so zaščita nacionalnih gospodarskih interesov, državna lastnina v ključnih panogah, pravično zagotavljanje storitev in ponovna naložba dobička državnih podjetij v javne projekte. Ugotovitve kažejo na močno usklajenost med anketiranci v vseh treh državah, kar podpira idejo, da državna lastnina zagotavlja gospodarsko suverenost in pravičen dostop do osnovnih storitev. Po drugi strani pa upravni odbori izražajo zaskrbljenost zaradi birokratskih ovir, s katerimi se soočajo državna podjetja, vpliva političnega vmešavanja na finančno uspešnost in omejitve javne lastnine pri izboljšanju globalne konkurenčnosti. Anketirani člani upravnih odborov so izrazili potrebo po večji avtonomiji pri odločanju in poudarili pomen partnerstev z zasebnim sektorjem za optimizacijo učinkovitosti državnih podjetij in njihovega položaja na trgu. Članek združuje te ugotovitve in obravnava širše vprašanje: Ali so državna podjetja bistvena v sodobnih gospodarstvih ali pa potrebujejo reforme, da se lahko spopadejo s sodobnimi izzivi? Rezultati kažejo, da so državna podjetja strateško pomembna, vendar so reforme, usmerjene v zmanjšanje birokracije, izboljšanje upravljanja in spodbujanje javno-zasebnih partnerstev, ključnega pomena za njihovo prihodnjo sposobnost preživetja.

Ključne besede: državna podjetja, upravljanje podjetij, javno-zasebno partnerstvo, birokratski izzivi, gospodarska suverenost.

Inflation, Inflation Uncertainty and Economic Growth in Tunisia: Nonlinear Modelling Framework

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Abstract

Inflation uncertainty is a critical factor influencing not only the market mechanisms but also the economic activity efficiency. In this paper, we investigated the relationship between inflation and growth to capture the impact of inflation uncertainty in Tunisia. The study relied on a dataset covering the period 1984.01-2018.08 and was characterized by a nonlinear specification. We used Hansen's (2001) Threshold Regression (TR) analysis to determine one threshold effect of inflation on growth while explaining the role of inflation uncertainty in the whole process. This study concluded that an optimal inflation rate does exist. Under this rate, a little rise in inflation may enhance economic growth, allowing an adverse impact of inflation uncertainty. Above the critical threshold of 3%, it was revealed that inflation and inflation uncertainty play opposite roles: while the former harms growth, the latter benefits it. Thus, we cannot sustain the Friedman-Ball hypothesis for the two regimes. To the best of the authors' knowledge, this is the first study that aimed to investigate the simultaneous effects of inflation and inflation uncertainty on growth in Tunisia using a nonlinear methodology. This study aims to fulfil the knowledge gap of such studies for developing countries.

Introduction

Undoubtedly, both inflation level and inflation uncertainty have an obvious influence on economic growth. Inflation uncertainty specifically refers to the unpredictable inflation volatility. It is captured through the degree of disagreement among inflation forecasts (Binder et al, 2025). Since the pioneering work of Tobin (1965), inflation uncertainty has gained a lot of popularity among researchers because of its role in the inflation-growth nexus (Mandeya & Ho, 2022). High inflation can adversely affect economic growth through inflation uncertainty (Okun, 1971). According to Friedman (1977), more inflation variability reduces the price-setting ability in organising economic

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activities, hampers the information function of price movements, and impedes long-run contracting, which in turn affects economic growth.

Such an importance led Gylfason & Herbertsson (2001), among many others, to confirm that the empirical investigations which ignore inflation uncertainty do not find a robust negative relationship between inflation and growth. Further, the consideration of the inflation uncertainty effect is important to implement relevant policies. Consequently, authorities should not only seek to reduce the level of inflation but also to stabilize it at the same time (Judson & Orphanides, 1999). Recently, using a panel of 33 countries, Binder et al. (2025) show that inflation uncertainty has adverse effects, notably by dampening real economic activity, exacerbating inflation, and reducing real sales and employment. Thus, monitoring inflation uncertainty is essential in monetary policy (Baharumshah *et al.*, 2016; lyke *et al.*, 2019).

Nishioka (2022) noted that the two variables that contributed to the huge inflation rate fluctuations are the retreat of globalisation and the lack of clarity in monetary policies. Therefore, inflation uncertainty has become the major cause of aggregate economic uncertainty since the Russian invasion of Ukraine (Londono *et al.*, 2023). Jongrim and Inhwan (2023) claim that over the last five decades, the increased inflation uncertainty was followed by significant decreases in output, particularly consumption of durable goods, and in investment. Furthermore, according to Jongrim & Inhwan (2023), because of "the evolving nature of underlying shocks (and their transmission channels)", the link between inflation and inflation uncertainty has evolved throughout time.

Regarding developing countries, Baharumshah *et al.* (2016) have already highlighted that the issue related to the role of both inflation and inflation uncertainty in influencing economic growth remains enigmatic, mainly for countries recording high inflation rates. Borio et al. (2023) noted that the behaviour of inflation varies depending on the nature of the regime period - a low- or high-inflation regime¹.

Besides, inflation uncertainty in emerging economies may have different dynamics given the diverse range of shocks and the imperfect institutions' credibility (Gülşen & Kara, 2019).

Only a few studies have investigated the tripartite relationship between inflation, inflation uncertainty and growth for middle-income countries (for example, Nas & Perry (2000) for Turkey, Grier & Grier (2006) for Mexico, lyke *et al.*, (2019) for Ghana, Hayati & Nitami (2021) for Indonesia). So, the originality of this study lies in clarifying and delineating this particular relationship in Tunisia.

The primary goal of this study was to use the regime-wise tests of the inflation-growth nexus during the period 1984.01-2018.08 to capture the influence of inflation and inflation uncertainty on growth in Tunisia using the threshold regression econometric technique suggested by Hansen (2001). The addressed question was whether considering the inflation uncertainty variable weakens, strengthens or changes the inflation-economic growth link.

Tunisia has experienced high levels of inflation, as well as significant inflation uncertainty. So, this issue is especially crucial for this country given the volatility of the inflation rate over the past decades and notably the recent surge in inflation after the revolution of January 2011. The post-revolution period has been characterised by an unstable economic environment and high inflation rates (Helali *et al.*, 2021; Becha *et al.*, 2023). According to Becha et al. (2023, p. 4), "Tunisia has not achieved the expected level of economic development due to the problem of inflation". Furthermore, the findings of this study are crucial to the Tunisian authorities who opted for targeting regimes.

Noteworthy, this is the first study that investigates the simultaneous effects of inflation and inflation uncertainty on growth in the case of a developing country, Tunisia, using a non-linear methodology. Besides, it might be viewed as an additional novel contribution to the papers of Boujelbene & Helali

¹ "While in a high-inflation regime the inflation rate is not self-stabilising, the regime itself is self-entrenching, just as is its low-inflation counterpart" (Borio et al., 2023)

(2017)² Helali et al. (2021)³ and Becha et al. (2023)⁴ that examined two types of relationships characterising the Tunisian economy: the inflation-growth nexus, on the one hand, and the inflation-financial development, on the other. Finally, we revisit the causality between the variables, which are inflation, inflation uncertainty and growth, investigated by Hachicha & Lean (2013) using the GARCH-in-mean model with a lagged variance equation for quarterly observations from 1988 Q3 to 2011 Q4 in Tunisia. Their findings show the importance of maintaining a low-inflation level since slow economic growth is essentially due to a high inflation uncertainty.

The remainder of the paper is organised as follows. A brief review of the literature was given in the second section. The materials and methods were revealed in Section 3. Section 4 introduced the empirical findings in full. The discussion was developed in Section 5, and the key findings and policy recommendations were provided in Section 6.

Literature Review

The theoretical literature shows a lack of the tripartite link between inflation, inflation uncertainty and economic growth. The theoretical examination by writers like Okun (1971); Friedman (1977); Cukierman & Meltzer (1986) and Ungar & Zilberfarb (1993) generated unclear, if not perplexing, results.

Inflation and Economic Growth Relationship

The findings of the various studies dealing with the causal link between inflation and economic growth, and ignoring inflation uncertainty, have been different across countries and time. Indeed, authors like Gylfason & Herbertsson (2001), Oikawa & Ueda (2018), Rocha et al. (2020), and Hayati & Nitami (2021) highlight a positive relationship. Other studies, like the one performed in South Africa (Hodge, 2006), assert that inflation negatively impacts long-run economic growth but has a positive influence on growth over the short term. Inversely, using the ARDL bounds testing, Ho (2018) focuses on the economic growth sources in Thailand

during the period 1975 to 2014 and concludes that inflation harms this growth over the short term but has a long-term beneficial influence.

Meanwhile, several researchers, who considered the evidence of a threshold effect, outline a mix of beneficial and harmful impacts in this relation. In line with this conclusion, Sarel (1996), Ndoricimpa (2017), Boujelbene & Helali (2017) and, recently, Phiri (2020) underline an asymmetric relation in the inflation-growth nexus. These studies assert that inflation plays a rather positive role in growth until reaching a certain threshold, after which its impact becomes negative.

Inflation Uncertainty and Economic Growth Relationship

A second set of studies investigated the inflation uncertainty influence on economic growth without considering inflation. Some researchers emphasised that this relationship is negative (Evans & Wachtel, 1993; Judson & Orphanides, 1999), among others, whereas others revealed a positive type of relationship or even a weak, if not negligible, one (e.g., Bredin & Fountas, 2009). According to Tobin (1965), inflation uncertainty prompts households to gather more real tangible wealth, boosting capital productivity and fostering growth. Recently, Metiu & Prieto (2023) concluded that in the US, an unanticipated increase in the uncertainty about core inflation produces inflationary consequences similar to a positive aggregate demand shock: after the shock, there is a considerable increase in industrial production, consumption, and consumer prices. The authors suggest that households' inflation expectations may act as a transmission channel, but this channel "does not come into play after a shock to the uncertainty of headline inflation".

Inflation, Inflation Uncertainty and Economic Growth Relationship

Additionally, researchers like Judson and Orphanides (1999); Nas & Perry (2000), Baharumshah *et al.* (2016), and lyke *et al.* (2019) estimated the influence of the two inflation types (e.g., both inflation and inflation

threshold variable. The study found that a low inflation rate (less than 4.89%) promotes economic growth.

⁴ Becha et al. (2023) use non-linear logistic smooth transition regression to study the relationship between financial development and economic growth in Tunisia, using inflation as a threshold, from 1965 to 2019. They conclude that inflation below 3.63% has a positive impact on economic growth. When inflation surpasses this threshold, it has a strong negative impact.

² Boujelbene and Helali (2017) addressed the issue of the threshold inflation effects on the relationship between inflation rate and economic growth in Tunisia for the 1982-01-2012-11 period using the Threshold Regression econometric technique suggested by Hansen (2001). The authors show a statistically significant negative relationship between the inflation rate and economic growth if the inflation rate is below the threshold value.

³ Helali et al. (2021) utilised a threshold regression model to examine the nonlinear link between economic growth and financial development in Tunisia from 1982 to 2018, with inflation as the

uncertainty) on economic growth and reached controversial and inconclusive results. Inflation uncertainty may therefore untangle the impact of inflation on economic growth. Accordingly, we reviewed the empirical literature in light of this set of studies. According to the Friedman-Ball hypothesis, both inflation and inflation uncertainty have the potential to harm economic growth. This hypothesis states that there is a positive correlation between the rate of inflation and the degree of inflation uncertainty (Friedman, 1977; Ball, 1992). It suggests that as inflation rises, uncertainty about future inflation also increases, due mainly to asymmetric information in the economy. Thus, the Friedman-Ball hypothesis emphasises the often-overlooked indirect costs of inflation, particularly those arising from heightened inflation uncertainty. A negative influence of the two types of inflation on growth is thus proven (e.g., Judson & Orphanides, 1999; Bhar & Mallik, 2013). A high inflation rate generates high inflation uncertainty because the public will begin to doubt the credibility of the monetary authorities (Ball, 1992). De Gregorio (1993) investigated a sample of twelve Latin American countries over the period 1950 to 1985 using panel data with random effects and White's robust correction for the standard errors. The author concluded that inflation hampers economic growth as it sends the capital cost high, limits its accumulation and decreases its productivity. Besides, since individuals do not know whether policymakers are able to control the inflation rate, they postpone their saving and investment-related decisions, fearing potential negative impacts on the resource allocation efficiency (Friedman, 1977).

Using a panel dataset of 87 countries over 30 years (1960–1992), Judson and Orphanides (1999) conclude that for countries recording high inflation rates, both inflation and inflation uncertainty⁵ hamper economic growth. Specifically, if the inflation level exceeds 10% per year, it is negatively and significantly correlated with growth. Therefore, the above-stated authors insist that the stability of inflation is crucial while looking forward to a high economic growth rate. Accordingly, the authorities should not only seek to lower the inflation level but also to stabilise it at the same time.

According to Grier *et al.* (2004), who used the bivariate GARCH model, inflation uncertainty negatively influences both the inflation rate and economic growth in the United States. In the same vein, the empirical investigation of Grier & Grier (2006), which relied on the multivariate EGARCH-M during the period 1972–2001,

postulates that inflation uncertainty has a negative and significant effect on growth in Mexico.

Mohd *et al.* (2013) test the relationship between inflation, its uncertainty and economic growth in five ASIAN nations from 1980 to 2011 using the Exponential GARCH model. They conclude that in all of the analysed countries, inflation uncertainty increases more in reaction to positive inflation shocks than to negative ones, as expected by the Friedman–Ball theory. However, the findings refute the idea that inflation is caused by inflation uncertainty. Instead, they suggest that inflation slows the economy, directly or indirectly, through the inflation uncertainty channel.

Hartmann & Roestel's (2013) empirical evidence for 34 developed and emerging economies from 1990 to 2010 using VARX-MGARCH-M models demonstrates that both inflation and inflation uncertainty significantly decrease growth. According to the authors, the negative effects of inflation or inflation uncertainty on growth appear to be negligible if inflation is low. This means that if the country is characterised by a modest inflation rate, it is probably going to incur output losses from the increasing inflation. In sum, they highlight that the detrimental effect of inflation on the economy fluctuated only in relation to magnitude. Furthermore, they notice that the impact of inflation on output is greater than the impact of output on inflation. If output increases by 1%, the resulting inflation effect is only 4 basis points. However, if inflation increases by 1%, output drops by about 1%. In addition, uncertain output affects the expansion of production.

Bhar & Mallik (2013) studied the issue in the United Kingdom and used the EGARCH-M model to assess the detrimental impact of inflation-on-inflation uncertainty, on the one hand, and growth, on the other. They showed that inflation uncertainty has a significant positive influence on the inflation rate but a significant negative impact on the production expansion. Moreover, in line with the hypothesis of Friedman, they found that inflation uncertainty considerably raises the rate of inflation. Further, the Generalised Impulse Response Functions reveal that inflation significantly enhances inflation uncertainty.

Nonetheless, a good deal of research argues that while inflation may adversely affect economic growth, inflation uncertainty can stimulate it. As an illustration and using GMM estimates for 88 countries during 1976–

⁵ Inflation uncertainty is inflation volatility defined as intra-year inflation observations.

2001, Lensink & Scholtens (2006) argue that inflation uncertainty has a significantly positive influence on the fluctuation of the economy.

In their study conducted in South Africa, during the period 1961Q1 - 2019Q4, Mandeya and Ho (2021) concluded that while increasing prices negatively affect growth in both the short and long runs, inflation uncertainty only affects the near run.

Considering a sample of 100 countries from 1960 to 1990, Barro (2013) studied the simultaneous impacts of inflation and uncertainty of inflation on economic growth. The author maintains that inflation reduces growth by decreasing the investment propensity. He found that inflation has a negative and considerable influence on growth, even at low rates, because it deeply affects both prices and market performance. In addition, if the average inflation increases by ten percentage points, the investment ratio decreases by 0.4-0.6 percentage points. However, the inflation uncertainty has no significant impact on growth.

Baharumshah *et al.* (2016) examine the impact of inflation and inflation uncertainty on growth in a set of 94 developing countries using the System Generalised Method of Moments (SGMM) over the period 1976–2010. They proved that both inflation and its uncertainty⁶ have substantial independent and meaningful influence on growth transmitted via the investment channel (Barro, 2013). The authors show that while inflation hampers growth, inflation uncertainty boosts it in non-inflation crisis countries. Notably, the positive impact of inflation uncertainty on growth is established when the level of inflation ranges between 5.6% and 15.9%⁷. Consequently, considering the inflation uncertainty variable, it weakens the inflation-growth link in the model. Indeed, if inflation uncertainty increases by one percentage point, the annual growth increases by about 0.028%. Yet, if we take into account the adverse impact of inflation, the overall outcome is detrimental.

Živkov *et al.* (2020) conclude that the Friedman-Ball hypothesis is confirmed for a sample of eight Central and Eastern European Countries investigated from January 1998 to December 2019. Following the evidence provided by the different GARCH models, inflation displays a remarkably less important negative effect on GDP compared to inflation uncertainty. So, inflation

seems to have an indirect effect on growth via inflation uncertainty.

Using a Bayesian panel SVAR with monthly data employed as a baseline for 2004-2019, Jongrim & Inhwan (2023) conclude that "a one-standard-deviation rise in inflation uncertainty was related to a reduction in industrial production by up to 10 per cent within two years after the shock in G7 countries". However, the impacts were very short-lived and less significant (up to a 6% drop) in the seven emerging market countries. The authors also claim that "Unlike G7 countries, where the inflation rate drops in response to higher uncertainty, EM7 countries usually experience higher inflation".

In their review of the literature, the study conducted by Mandeya & Ho (2022), dealing with the two inflation types and their impact on economic growth, the authors state that inflation inhibits growth. The literature, however, seems to be reluctant when discussing the effects of inflation uncertainty.

Therefore, given the controversial results of the previous studies, this investigation tried to shed light on this topic by studying the impact of inflation, inflation uncertainty and economic growth in a developing country, Tunisia. Moreover, to the best of our knowledge, the only study investigating the affinity between inflation, inflation uncertainty and growth in the Tunisian case was that of Hachicha & Lean (2013). The authors used the GARCH-M model with a lagged variance equation for quarterly observations from 1988 Q3 to 2011 Q4 in Tunisia. Their study relies on time series of nominal inflation rate as well as nominal and real gross domestic product. They point out that inflation uncertainty positively influences inflation but only over the long run. This research study, however, focused on the tripartite relationship in Tunisia using a threshold method.

Methodology

This study dealt with the asymmetric effects of inflation uncertainty on the inflation-growth nexus. To achieve this, we used Hansen's (2001) Threshold Regression (TR) approach to allow for a single threshold effect of inflation on growth. We defined growth in terms of inflation, its uncertainty and money supply. Our simple model considers the industrial production index as an endogenous variable. As for the explanatory variables,

⁶ Inflation uncertainty is calculated as the standard deviation of inflation over a five-year period.

⁷ In robustness, Baharumshah *et al.*, (2016) found that inflation uncertainty has a negative and significant impact on growth at low inflation rates, while it is positive and significant at high inflation rates.

the model takes the inflation rate, inflation uncertainty and money supply as proxies reflecting the financial sector depth. Our linear regression equation is therefore written as follows:

$$\ln IPI_t = \alpha_0 + \alpha_1 \pi_t + \alpha_2 \ln M_{3t} + \alpha_3 INFUN_t + \varepsilon_t \quad (1)$$

where $\ln IPI_t$ stands for the Industrial Production Index. Just like Vazquez (2002) and Boujelbene & Helali (2017)⁸, we referred to the IPI as an indicator of economic growth instead of the Gross Domestic Product (GDP) because of the lack of monthly data. π_t denotes CPI inflation. $\ln M_{3t}$ expresses the logarithm of money supply as a proxy for financial sector depth; $INFUN_t$ reflects the uncertainty of inflation. \ln denotes the operator of the natural logarithm, $\alpha = (\alpha_0, \alpha_1, \alpha_2, \alpha_3)$ are the coefficients of the model; ε_t is the white-noise error term; t is the time subscript.

In theoretical terms, rising inflation is predicted to impede growth, as highlighted by Friedman (1977) and Ball (1992), among others (see Mandeya & Ho, 2022). Thus, the coefficient α_1 is expected to be negative. Theoretically, money supply boosts growth, which means that the coefficient α_2 is expected to be positive. In addition, inflation uncertainty may hinder or enhance growth (see Friedman, 1977; Ball, 1992; Blackburn, 1999). Therefore, the coefficient α_3 can be either negative or positive.

The standard linear model is shown in Equation (1). Unlike several studies, the investigated threshold variable in this research should be some optimal inflation rate values. This implies an asymmetric relationship between economic growth, inflation rate and inflation uncertainty. However, the probable econometric issues that may interfere with the threshold effects estimation urged the development of some suitable estimation methods. Equation (1) can therefore be rewritten as follows:

$$\begin{aligned} \ln IPI_t = & (\alpha_{10} + \alpha_{11} \pi_t + \alpha_{12} \ln M_{3t} + \\ & \alpha_{13} INFUN_t) d[\pi_t \leq \gamma] \\ & + (\alpha_{20} + \alpha_{21} \pi_t + \alpha_{22} \ln M_{3t} + \\ & \alpha_{23} INFUN_t) d[\pi_t > \gamma] + u_t^* \end{aligned} \quad (2)$$

We used the minimization of the residual sum of squares to get a threshold value. Taking into account the main target of this study, investigating the inflationary threshold effects on inflation, inflation uncertainty and economic growth nexus, we referred to the CPI as an indicator of inflation and π_t the threshold variable.

Consequently, we estimated equation (2) with the hypothesis of no threshold effect ($H_0: \alpha_{1i} = \alpha_{2i}$ where $i = 0, \dots, 3$) versus the hypothesis where ($H_1: \alpha_{1i} \neq \alpha_{2i}$ for $i = 0, \dots, 3$).

The traditional approaches cannot be used here since they cannot test the threshold value " γ " as it is unknown. Similar to Hansen (1996), we determined the asymptotic critical value and the p-value using the Lagrange Multiplier (LM) Bootstrap Technique. Taking into account the null hypothesis H_0 , the below standard F-statistics was used:

$$F_1 = \frac{S_0 - S_1(\hat{\gamma})}{\hat{\sigma}^2} \quad (3)$$

with S_0 and S_1 are the residual sums of squares under the hypothesis: $H_0: \alpha_{1i} = \alpha_{2i}$ for $i = 0, \dots, 3$.

We tested the null hypothesis to detect whether linearity is strongly rejected. If a threshold effect exists, the next issue is whether this threshold value can be known or not.

Results

Data Description

The Industrial Production Index (IPI) and the Liquid Liabilities (M_3) were collected from the Tunisian Central Bank. As for the Consumer Price Index, it was gathered from the Tunisian National Institute of Statistics database. Our dataset covers the period 1984.01 - 2018.08. The variables are described in Table 1.

The results in Table 2 show descriptive statistics, including the mean, median, maximum, minimum, standard deviation, skewness and kurtosis coefficients, and the Jarque-Bera statistics to test the null hypothesis that all the variables are normally distributed.

⁸ Vazquez (2002) examined the nature of the relationship between output and inflation in 15 countries of the European Union and the United States. The author uses the index of industrial production to reflect production.

-The study of Boujelbene and Helali (2017) examined the threshold effects on the relationship between inflation rate and economic growth in Tunisia. The authors use the index of industrial production to reflect economic growth.

Table 1*Definitions of the variables*

Variables	Definition	Source
IPI	Industrial Production Index (with 2010 serving as the base year)	Tunisian Central Bank
CPI	Consumer Price Index (with 2010 serving as the base year)	Tunisian National Institute of Statistics
M ₃	Liquid liabilities	Tunisian Central Bank
INFUN	Inflation uncertainty (the standard deviation of inflation)	Tunisian National Institute of Statistics

Note: According to Grier & Perry (1998), "Inflation uncertainty, referring to unanticipated volatility in the general prices, is an unknown variable". Furthermore, Kliber et al. (2023) define uncertainty as the standard deviation of the variable in question. Even if it is true that this approach is by no means the only alternative to define uncertainty, it is still the most well-established in economic theory. Therefore, similar to Kliber et al. (2023), the uncertainty of inflation was obtained via the standard deviation of inflation in this study.

Source: Authors

Table 2*Summary statistics*

Designation	IPI	CPI	M3	INFUN
Mean	83.018	89.352	30570.75	0.090
Median	89.000	82.150	23268.00	0.068
Maximum	110.000	149.500	76526.00	0.495
Minimum	43.430	53.800	6562.00	0.002
Standard Deviation	16.670	25.338	20684.77	0.078
Skewness	-0.886	0.629	0.608	1.994
Kurtosis	2.546	2.299	2.060	8.472
Jarque-Bera Probability	42.976	26.653	30.320	588.444
Observations	0.000	0.000	0.000	0.000
	308	308	308	308

Source: Authors

We find it relevant here to unveil the characteristics of the IPI, CPI, M3 and INFUN variables. The IPI mean was around 83.018 from the period 1984.01 - 2018.08, with a standard deviation of about 16.670. The variable has a minimum and maximum of 43.430 and 110, respectively. The distribution is asymmetric on the left (skewness lower than 0). In addition, this variable is platykurtic with a kurtosis greater than 0. Furthermore, the results of Jarque-Bera test provide enough evidence to reject the null hypothesis, indicating that the series in question is not normally distributed.

Considering the 308 observations spanning from 53.8 to 149.5, the CPI variable has a mean of 89.352, a median of 82.150, and a standard deviation of 25.338. The skewness of the series is 0.629, indicating a rightward asymmetry, and the kurtosis has a high value of 2.299, supporting the leptokurtic nature of the series. Furthermore, the test developed by Jarque & Bera (1987) yields negative results for the null hypothesis of normal distribution.

The M3 variable has an average of 30570.75, a median of 23268, and a standard deviation of 20684.77. Spanning from 6562 to 76526, the range of the 308 observations shows how widely this variable may vary. This series has a slightly right-skewed distribution, as indicated by its skewness of 0.608, and a leptokurtic distribution, as indicated by its high kurtosis of 2.060. Additionally, the normality null hypothesis according to the Jarque & Bera (1987) test can be rejected.

The mean of Inflation uncertainty (INFUN) was around 0.09 with a minimum and maximum of 0.002 and 0.495, respectively. The variable has a standard deviation of about 0.078. The distribution is asymmetric on the left (skewness greater than 0). Moreover, this variable is weakly platykurtic with a kurtosis value more than 0. Besides, the null hypothesis of normality was rejected by the Jarque-Bera test.

Regarding symmetry, the distributions are asymmetric for the variables CPI, M3 and INFUN on the right. However, the distribution for the variable IPI is asymmetric on the left. Such characteristics in descriptive statistics might indicate that the variables are non-stationary at the level. Consequently, we checked their stationarity using some other well-known methods.

Unit Root Test

Before using the threshold regression approach, it is recommended to test the stationarity of all the variables of the model. We used the Perron (1997) unit root test, which allows for a break under both of the null and alternative hypotheses. These tests are less effective than the usual DF-type test when there is no break.

Table 3 displays the results of Perron's (1997) stationarity tests. It can be observed that all the variables in the three models (A, B and C) are stationary in the first difference for 1% and 5% risks. The results also reveal a significant rupture for the three models, proving the asymmetry of the data in the series considered in this research.

Table 3
Results of the Perron (1997) test

Model	Designation	IPI	CPI	M ₃
In level				
A	Break date	2013:06	2016:013	2009:12
	t-statistic	-2.565	0.457	-1.681
B	Break date	2007:11	2009:12	2004:06
	t-statistic	-5.186	-1.641	-3.578
C	Break date	2011:11	2017:09	2005:11
	t-statistic	-2.865	-3.532	-3.793
Decision		NS	NS	NS
In first difference				
A	Break date	2010:06	2017:02	2007:08
	t-statistic	-8.639***	-5.22**	-5.778**
B	Break date	2010:06	2005:02	2008:03
	t-statistic	-8.563***	-6.156**	-5.716**
C	Break date	2007:10	2004:02	2002:11
	t-statistic	-7.177***	-5.171**	-5.227**
Decision		S	S	S

Notes: NS: non-stationary; S: stationary. The unit root hypothesis is rejected at the 1% level (***) and at the 5% level (**). Model A allows for a modification in the constant. Model B evaluates the series' stationarity around a broken trend. Model C allows for changes in both the constant and the trend. Model A's critical values are (-5.70), (-5.10), and (-4.82); model B's are (-6.21), (-5.55), and (-5.25); and model C's are (-5.28), (-4.65), and (-4.38).

Source: Author's computation

Testing the Existence of Inflationary Threshold

To investigate the impact of inflation uncertainty and money supply on growth in Tunisia, we used Hansen's (2001) approach, taking into consideration different inflation regimes. In this context, inflation served as a threshold variable. This procedure allows us to test the

linear model (null hypothesis) versus the two-regime model (alternative hypothesis). The obtained results of the above-mentioned tests are displayed in Table 4. The F1 statistics equals to 17.07 and is statistically significant at a bootstrap p-value of 0.005. This confirms that a threshold of 3.00% does exist, indicating the presence of a structural break in our data.

Table 4
Results of the optimal Threshold Test

Test Hypothesis	F ₁ test	Bootstrap P-Value	Optimal Threshold Estimates %	95 % Confidence Interval
H1: one threshold	17.07***	0.005	3.00 %	[1.36%, 3.92%]
H0: no threshold	10.41	0.244	4.98 %	-

Notes: The null hypothesis of no threshold is tested against the alternative hypothesis of the threshold. The threshold is calculated by minimising the sum of the squared residuals. *** indicates statistical significance at the 5% level.

Source: Author's computation

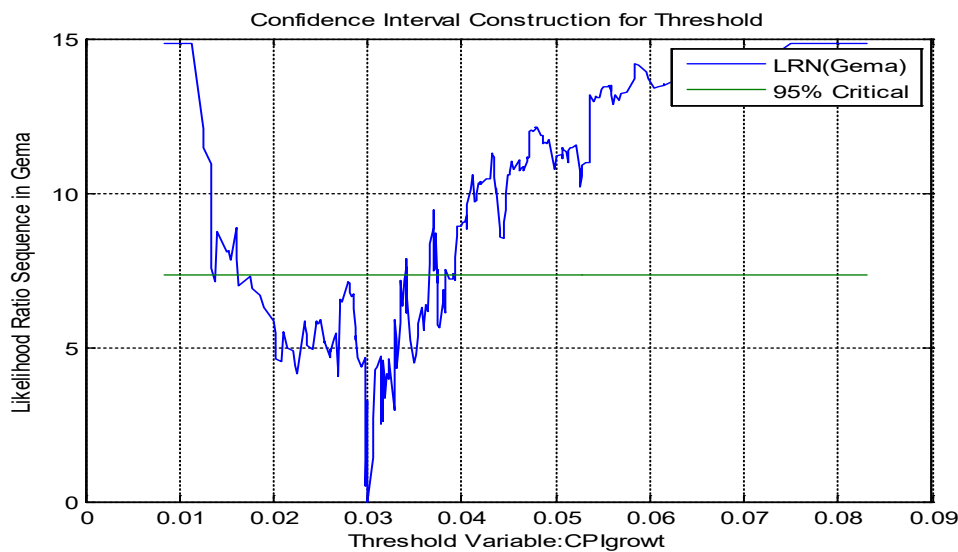
The likelihood ratio (LR) test was then analysed to investigate the confidence interval around the determined threshold. The 95% asymptotic confidence interval is [1.36%, 3.92%]. Figure 1 shows the standardised LR (γ) statistics as a function of the threshold of the inflation rate.

The least squares estimate of the threshold (γ) is the value that minimises the function LR (γ) at $\gamma = 3.00\%$. This

finding suggests that the threshold estimates are extremely accurate. Thus, there is strong evidence to support one breakpoint in the link between economic growth and inflation uncertainty. This validates the hypothesis that some dynamics among inflation, its uncertainty and output may be prone to structural change, as already suggested by Kontonikas (2004), Bredin et al. (2009), among others.

Figure 1

The normalised likelihood ratio sequence statistics: function of the inflation rate threshold



Source: Author's computation

So far, the link between inflation, inflation uncertainty, and growth has been studied considering different inflation regimes. The findings are displayed in Table 5. For comparison purposes, the first column shows the

estimates for a linear regression, equation (1), that ignores the threshold effect, whereas columns 2 and 3 provide the estimates of the two-regime TR model, equation (2).

Table 5

Results of the estimation of the linear and TR model

Variables	Linear Regression	Threshold Regression Model	
		Regime 1 $\leq 3.00\%$	Regime 2 $> 3.00\%$
Constant	0.04 (2.01)**	-0.06 (3.25)***	0.041 (2.09)**
π	-0.59 (3.28)***	1.77 (3.05)***	-0.47 (3.41)***
$\ln M_3$	0.02 (4.15)***	0.07 (4.37)***	0.017 (3.36)***
INFUN	-0.003 (3.04)***	-0.004 (5.02)***	0.009 (3.34)***
Observations	415	201	214

Notes: ***, **, and * represent statistical significance at 1%, 5%, and 10% levels, respectively.

Source: Author's computation

Discussion

According to the linear regression, both inflation and its uncertainty slow growth in Tunisia. Apart from this effect, our findings suggest that the money supply (M3), a proxy for financial development, contributes to the economic expansion. This is in line with the findings of Ghali (1999) and Ben Jedidia et al. (2014), who found that financial development is an important component of the long-term growth in Tunisia.

boosts economic growth (with a coefficient of 1.77) up to the threshold, while at higher rates the effect becomes negative (with a coefficient of -0.47). Although the inflation uncertainty coefficient shifts from positive to negative, both values are significant. Our empirical results are consistent with those of Baharumshah et al., (2016). Thus, for both regimes, we cannot sustain the Friedman-Ball hypothesis suggesting that both inflation and its uncertainty may hinder growth.

A non-linear model can be divided into two regimes based on whether inflation is above or below the 3.00% threshold. Inflation and inflation uncertainty do not have the same effect in the two regimes. Indeed, inflation

It was found that if the inflation rate is lower than 3%, it positively affects the economic growth in Tunisia. This evidence is opposite to the results achieved by Barro (2013), who considered a large sample of countries and sustained that inflation, however low its rate is, has a

negative influence on growth. Nevertheless, if the level of inflation exceeds 3%, it significantly impedes growth. This can be explained by the fact that if inflation exceeds the optimal threshold, it impedes the information function of price fluctuations, preventing long-term contracting and, as a result, slowing economic growth (Friedman, 1977). Inflation has a distortionary impact on the market allocation efficiency. The effect of inflation on growth in Tunisia appears to differ not just in terms of magnitudes, as in Hartmann and Roestel's (2013) analysis, but the positive influence seems to become negative. As argued by Mohd *et al.* (2013), this can be because inflation slows the expansion of the economy, whether directly or indirectly (*via* the inflation uncertainty channel). In addition, this corroborates the results of the study of Boujelbene & Helali, suggesting that, in Tunisia, inflation fosters growth when it is above a threshold value (3.48%).

In Tunisia, financial development boosts economic progress under both regimes because banks dominate the financial system in a context of a narrow financial market. Credits offered by banks help finance investment and consequently stimulate economic growth (Ben Jedidia *et al.*, 2014). In addition, it can be noted that the effect of M3 is higher in the first regime than in the second. This can be attributed to the fact that the increase in inflation disturbs the banking intermediation and its contribution to fund allocation. In other words, if inflation exceeds the threshold, there will be a decline in the deposits and savings collection and credit rationing, which ultimately affects the economy.

The impact of inflation uncertainty is negative in the first regime but becomes positive in the second, which means that inflation uncertainty has to be taken into account in the inflation-growth link in Tunisia. This result is in line with that of Grier & Grier (2006) in their study on Mexico but differs from that of Fountas (2010), who proved that inflation uncertainty is harmful to production growth. Furthermore, unlike Hachicha & Lean (2013), our findings came to support Friedman's claim that inflation uncertainty has negative impacts. Oppositely, Baharumshah *et al.* (2016) showed that the uncertainty of inflation boosts growth in countries that do not experience an inflation crisis, especially when it ranges between 5.6 and 15.9%.

In regime 2, in the context of this research study, the uncertainty inflation positively influences economic growth in Tunisia despite its very low coefficient (0.009), which contradicts the prevailing theory. So, for this regime, the results are non-consistent with those of Grier

& Grier (2006), highlighting that inflation and its uncertainty have a negative impact. We can argue the findings of Baharumshah *et al.* (2016) by the fact that inflation has a stronger negative impact than the positive impact of inflation uncertainty in developing countries. The nonlinearity of the link between inflation uncertainty and growth was found to depend mostly on the inflation regime in Tunisia. It can, therefore, be concluded that the inflation uncertainty matters in the nexus between inflation and growth in both regimes. It is worth noting that inflation and its uncertainty have contradictory effects on the economy.

In the first regime and below the 3% threshold, the rate of inflation is a positive driver of growth; nevertheless, inflation uncertainty is a headwind to this growth. This is in line with Stockman's (1981) idea when he introduced a cash-in-advance model, arguing that money and capital play complementary roles in enhancing the economy, but highlighted that uncertainties about inflation deeply affect the efforts made to acquire capital stock. This inevitably leads to an unforeseen redistribution of wealth, which, in turn, hinders economic growth even at a low inflation rate.

However, in the second regime, it was revealed that inflation and inflation uncertainty play opposite roles: while the former harms growth, the latter benefits it. Thus, when we simultaneously consider the influence of both types of inflation, we can point out that they have opposite effects on economic growth in Tunisia. This can be explained by the idea suggesting that the inflation uncertainty encourages people to accumulate more financial assets while reducing the non-interest-bearing assets, boosting capital formation and consequently economic growth (Tobin, 1965). Another explanatory alternative was provided by Baharumshah *et al.* (2016), who came to the conclusion that while the impact of inflation on growth is negative, the uncertainty of inflation enhances growth through inciting precautionary savings, which will thereby serve as funds for investment, which confirms our findings. Metiu & Prieto (2023) have provided a third explanation, claiming that an unanticipated rise in unpredictability about the core inflation rate in the US produces inflationary consequences similar to a positive aggregate demand shock. After the shock, there is a considerable increase in industrial production, consumption, and consumer prices. The authors suggest that households' inflation expectations may act as a transmission channel that "does not come into play after a shock to the uncertainty of headline inflation".

Robustness Check

Assessment tests were performed on the regression residuals during the final stage of our empirical method. The threshold regression model was evaluated for autocorrelation, ARCH effects, and normality effects. The assessment test findings are provided in Table 6.

Table 6

Diagnostic tests

Tests	t-statistic	p-value	Decision
LM test	40.160	0.567	No autocorrelation
ARCH test	1.700	0.190	No ARCH effects
Shapiro-Wilk test	0.734	0.890	Normal distribution

Note: The Lagrange Multiplier test for the Breusch–Godfrey serial correlation is known as the LM test. The autoregressive conditional heteroscedasticity test is known as the ARCH test. The Shapiro-Wilk test utilises to test the presence of normality.
Source: Author's computation

First, the serial correlation among the error term of the estimated regression was confirmed when the LM statistic was employed to test the null hypothesis for no autocorrelation. In addition, no ARCH effects were detected in the regression residuals. While the JB test statistic was estimated to be 9.34 with a p-value of 0.000, rejecting normal distribution of residuals in the estimated regression model.

Conclusion

Inflation uncertainty and inflation are critical factors influencing the market mechanisms, on the one hand, and the efficiency of economic activities, on the other. Therefore, most central banks have been committed to pursuing and maintaining low and stable inflation rates to enhance capital formation, information flow, productivity and economic expansion. The literature focused on studying the effects of inflation or inflation uncertainty on economic growth separately and reached mixed conclusions. This study, therefore, aimed at investigating the influence of the two types of inflation

on economic growth in a developing country, Tunisia, given the recent surge in inflation after the revolution of January 2011. The novelty of this research was to examine the moderating influence of inflation uncertainty through the assessment of the effect of inflation on economic growth in Tunisia. It contributed to the existing literature through investigating a tripartite relationship between inflation, inflation uncertainty and economic growth. Methodologically, the study relied on a non-linear approach. It addressed the issue of the effects of inflation uncertainty on the inflation-economic growth link in Tunisia. So, it used the regime-wise tests to reveal the type of link between inflation and growth and capture the impact of inflation uncertainty on this growth.

Considering the linear and nonlinear specifications of a dataset covering the period 1984.01-2018.08, inflation and inflation uncertainty were found to have mixed, if not opposite, effects on economic growth. It can be concluded that there exists an optimal inflation rate. Below this optimal rate, a weak increase in inflation may enhance growth; however, above the 3% threshold, a rise in the inflation rate adversely affects real growth. Moreover, our empirical findings show that, in the second regime, the inflation drawbacks seem to outnumber the advantages of inflation uncertainty. Thus, for both regimes, we cannot sustain the Friedman-Ball theory suggesting that both inflation and its uncertainty may hurt economic growth.

To stimulate the expansion of the Tunisian economy, the authorities should keep on aiming for a lower inflation target of 3%, while ensuring minimum inflation uncertainty. Nevertheless, keeping inflation uncertainty under control in an inflation-targeting system requires a credible and independent monetary policy. Besides, controlling inflation and its variability is not enough to boost economic growth; it is the whole financial system that requires being updated, if not reviewed. Specifically, enhancing the savings–investment process requires both the restructuring of the banking sector and the development of a well-functioning financial market.

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Inflacija, inflacijska negotovost in gospodarska rast v Tuniziji: nelinearni model

Izvleček

Negotovost inflacije je ključen dejavnik, ki vpliva ne le na tržne mehanizme, temveč tudi na učinkovitost gospodarske dejavnosti. V tem prispevku smo raziskali razmerje med inflacijo in gospodarsko rastjo, da bi ugotovili vpliv inflacijske negotovosti v Tuniziji. Študija temelji na podatkovnem nizu za obdobje od januarja 1984 do avgusta 2018 in vključuje nelinearno specifikacijo. Uporabili smo Hansenovo (2001) metodo pragovne regresije (Threshold Regression - TR), da bi določili nelinearni učinek inflacije na gospodarsko rast ter pojasnili vlogo inflacijske negotovosti v celotnem opazovanem obdobju. Ugotovili smo, da obstaja optimalna stopnja inflacije. Pod to mejo lahko rahlo zvišanje inflacije spodbudi gospodarsko rast, vendar hkrati povzroči neugoden vpliv inflacijske negotovosti. Nad kritičnim pragom 3 % pa inflacija in inflacijska negotovost igrata nasprotni vlogi: medtem ko inflacija škodi gospodarski rasti, ima inflacijska negotovost pozitiven vpliv. Zato hipoteze Friedmana-Balla ni mogoče potrditi za obe obravnavani obdobji. Po najboljšem vedenju avtorjev je to prva študija, ki preučuje sočasne učinke inflacije in inflacijske negotovosti na gospodarsko rast v Tuniziji z uporabo nelinearne metodologije. Študija poskuša zapolniti vrzel v poznavanju tovrstnih vplivov v državah v razvoju.

Ključne besede: pragovni regresijski model, inflacija, negotovost glede inflacije, gospodarska rast, Tunizija

Adoption of Social Media for Products Marketing in Algerian Traditional and Handicraft Firms: Evidence from Setif Province

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Abstract

Social media provides opportunities for traditional and handicraft industries to promote products and stimulate sales. Therefore, this study investigates the extent of social media adoption for product marketing among a sample of Algerian traditional and handicraft industries. For that, a questionnaire was administered to 123 randomly selected industries in Setif province. The results revealed moderate social media use for product marketing, along with low awareness of its benefits. The level of usage is strongly associated with awareness but was negligibly affected by age. Experience with social media did not predict usage for marketing. The findings suggest that this sector can further capitalise on social media by increasing managers' awareness of its advantages and developing strategies to enhance its adoption. Further research should identify specific actions that traditional and handicraft firms can take to fully leverage social media for product promotion and sales growth.

Introduction

The emergence of social media and digital marketing platforms represents a seismic shift for businesses across all sectors (Dwivedi et al., 2021, p. 2), providing new opportunities to reach customers and promote their products and services (Appel, 2020, p. 85). However, prior studies indicate that traditional handicraft companies have often lagged in adopting and leveraging these technologies (e.g., Jalil et al., 2022, p. 55; Vaculčíková et al., 2020, p. 8). This paper examines the integration of social media marketing among handicraft businesses in Algeria, with a focus on Setif province.

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Algeria's handicraft sector holds rich cultural and economic significance. However, these artisanal companies now face rising competition and pressure to establish an online presence (Guettafi & Chaa, 2018; Abdeldjebar & Hadji, 2016). Academic literature highlights that small businesses frequently struggle with digital transformation (Yuen & Baskaran, 2023, p. 438). Therefore, assessing social media adoption can provide meaningful insights into the marketing capabilities and digital readiness of Setif's handicraft industry.

This study is based on a survey questionnaire to collect data from handicraft business managers in Setif about the current usage of social media marketing among these companies, along with factors driving or inhibiting the adoption. The findings intend to provide insight for public and private stakeholders on strategies and interventions that could help handicraft businesses in Setif optimise the usage of social media marketing techniques. With appropriate support, it is hoped that traditional artisanal industries can bolster their digital proficiency to ensure continuity and expansion by leveraging online promotional opportunities.

This paper is structured as follows. The second section provides an overview of marketing in Algerian traditional and handicraft industries, while the third section reviews the relevant literature. Then, the fourth section outlines the methodology, and the fifth section presents and discusses the key findings, interprets these findings, and explores the practical implications. Finally, the conclusion summarises the overall goals and contributions of this study.

The Marketing Landscape in Algerian Traditional and Handicraft Industries

The Algerian legislator defines traditional handicraft industries and companies in Order No. 96-01 of 10/06/1996 as any activity of production, creativity, transformation, artistic restoration, maintenance, repair, or service delivery distinguished by a manual nature, practised as a main and permanent vocation in either a fixed, mobile, or occasional manner, individually or under a cooperative or company engaged in traditional industries and crafts (Secrétariat Général du Gouvernement, 1996, p. 4).

The legislator delineates three realms of traditional industries in the same order:

- Practical traditional craft industry that produces regular consumer materials without specific

artistic values, aimed at households, industry and agriculture.

- Manual-intensive crafts that produce practical and decorative goods and acquire an artistic dimension by enabling the transfer of age-old skills, distinguished by originality, uniqueness, and innovation.
- Providing services of maintenance, repair, restoration and technical conservation.

Guettafi & Chaa (2018) argue that due to factors like intensifying foreign competition, Algeria's traditional handicraft industries suffer from a lack of structured marketing policies, which is a fundamental challenge facing artisans. The unavailability of dedicated spaces to sell products poses the biggest obstacle, diminishing artisans' motivation to manufacture quality goods and diversify offerings that could develop the craft. Participation in trade fairs and festivals alone is insufficient for product marketing, especially given the new crafts emerging amid the influx of artisans.

Furthermore, craftspeople face raw material scarcity issues, making their wares costlier compared to lower-quality imported alternatives. Guettafi & Chaa (2018) add that the state's limited encouragement has not deterred artisanal production across domains like pottery, wool, copper, leather, confectionery and traditional foods through "home-based marketing". Ultimately, the researchers suggest eschewing such conventional marketing approaches to circumvent the aforementioned problems. They propose leveraging internet marketing, enabling remote promotion of products without incurring significant marketing and sales costs.

According to Abdeldjebar & Hadji (2016), the traditional industries in Algeria face a lack of foresight in formulating appropriate marketing mix policies as follows:

- The lack of a defined marketing approach, with artisans emphasising sales over strategic marketing, leads Algerian consumers to favour imported substitutes that may be more attractive in price, quality, or other factors.
- Pricing of goods is dictated by several factors, like expensive raw material costs that inflate production costs. For consumers, artisanal prices appear high, while crafters view them as low, barely covering manufacturing outlays given raw material price inflation. This short-sightedness in setting suitable domestic pricing

has dampened demand, as competitors' prices are perceived as more affordable.

- There is a lack of specialised distribution channels for local traditional products, unlike foreign companies pursuing predatory pricing strategies to flood domestic markets. Artisans also lack retail outlets to showcase their offerings.
- Effective promotional policies are absent in the traditional industry sector. Artisans typically produce first before attempting sales without dedicated marketing efforts. This stems from ignorance about marketing concepts or an inability to afford advertising costs, resulting in consumer unawareness about local products and fuelling a preference for imported alternatives over authenticity.

Upon surveying numerous newspaper articles dedicated to discussing the marketing challenges faced by artisans in Algeria, we found that these articles generally converged on the notion that traditional and handicraft industries suffer from product oversaturation due to the lack of exhibition spaces, leading to low sales. Additionally, artisans bear the costs associated with participating in these exhibitions, further exacerbating the burdens on these professionals who already struggle with limited financial and material resources.

Faced with the aforementioned issues, the researchers believe that social media platforms could serve as a suitable alternative to overcome these challenges, considering the advantages and positive impacts that these platforms can have on the marketing strategies of traditional and handicraft industries.

Literature Review

Social Media Marketing

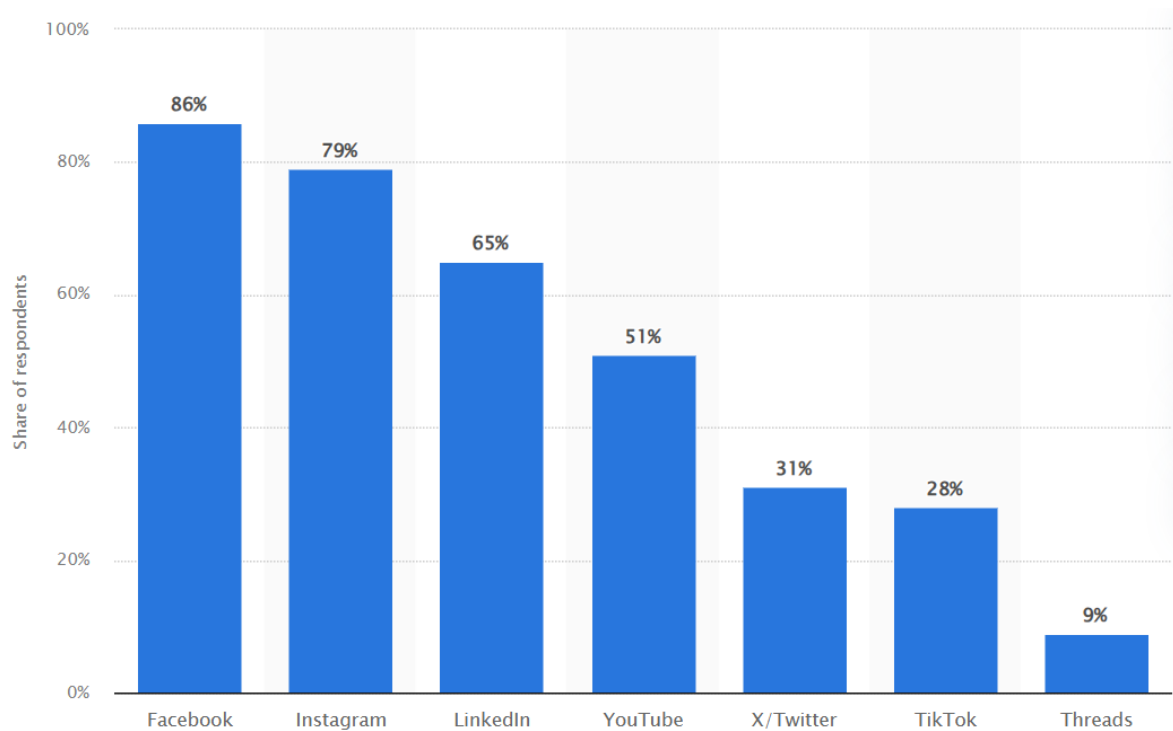
Social media marketing can be defined in various ways. Barefoot & Szabo (2010, p. 13) conceptualise it as utilising social platforms to promote an organisation and its offerings, representing a new digital marketing approach complementing existing online strategies. Meanwhile, Weinberg (2009) argues that it is

fundamentally based on engaging target audiences through relevant content and interactions. Additionally, Chi (2011) states that it constitutes connecting brands with consumers via personalised networking and social interactivity.

Synthesising these perspectives, this study considers social media marketing as the strategic use of interactive, conversational platforms to develop company-customer relationships, thereby promoting brands, products and services. The core goal is to leverage the interconnected nature of social networks for superior marketing outcomes.

The internet presents opportunities for crafters, such as developing online catalogues, accessing design inspiration, gathering market information, and showcasing products through online videos (Weinberg & Pehlivan, 2011, p. 279). Moreover, crafters can reap numerous advantages by adopting internet marketing more broadly through facilitating entry into e-commerce and online selling channels, reducing costs and time requirements through digitised processes, expanding market reach from local geographical areas to national and global consumer bases, providing greater opportunities to increase sales given the expanded market access, and enabling more targeted product positioning to specific consumer segments based on detailed audience data available through online analytics (Kumar & Pv, 2013, p. 541).

Owing to its ability to effectively and efficiently engage with a broad and diverse audience, social media now plays a central role in contemporary marketing strategies. A Statista survey on social media platforms utilised by marketers worldwide in 2024 suggests that Facebook is the most employed platform, with 86% of marketers, followed by Instagram with 79%, then LinkedIn with 65%. Other platforms like YouTube, X (formerly Twitter), TikTok, and Pinterest are also part of marketers' strategies, with lower percentages of usage. This fact emphasises the predominance of Meta platforms as advertising channels and the growing role of social media platforms and video-centric ones in global marketing strategies.

Figure 1*Leading social media platforms used by marketers worldwide as of Jan 2024**Source: Statista (2025).*

The Use of Social Media in Traditional and Handicraft Industries

Previous research highlights the potential of social media for handicraft marketing across diverse contexts. Studies indicate that platforms like Facebook, Instagram, and Twitter are leveraged, particularly by small enterprises and women entrepreneurs, due to low costs, ease of use, extensive reach, and the ability to overcome traditional market barriers (Rahadi & Abdillah, 2013; Alghamdi & Reilly, 2013). Social media adoption has been shown to enhance performance by reaching more customers, building brand recognition, increasing sales, and generating profits (Kazungu et al., 2017).

However, challenges persist, especially in developing economies, including limited awareness, resource constraints, digital illiteracy, security risks, and infrastructure gaps (Kazungu et al., 2017; Abhijitkaziblog, 2016; Makhitha, 2016). Specific studies confirm social media marketing's positive impact on handicraft brand awareness, image, and purchase intention (Guha et al., 2021), and its role in business survival, although often requiring external support (Jalil et al., 2022).

In the Algerian context, Charchafa & Bouchareb (2020) examined social media use among 106 handicraft enterprises in Setif and found an average adoption level for product marketing, low managerial awareness of its importance, a strong influence from awareness on usage, a minor effect from age, and no effect from social media experience, based on early 2020 data. This present study builds upon and extends their work in several important ways. First, we employ a larger sample size (123 versus 106 respondents), potentially improving statistical power and representativeness.

Second, building on the factors identified in the prior study regarding managerial awareness, age, and social media experience, our study utilises regression analysis to specifically quantify the individual impacts of these variables on adoption levels. Third, our research design allows for a more detailed analysis of specific social media marketing practices employed (e.g., promotion vs. feedback gathering) rather than focusing solely on general adoption levels reported previously. Finally, our study captures more recent data (from 2024), reflecting the rapid evolution of social media platforms and potentially changed user behaviours in the post-

pandemic context. These differences allow for a more updated and nuanced understanding of the current state of social media marketing within this sector.

Research Methodology

Research Questions and Hypotheses

The analysis of prior literature on social media adoption among traditional handicraft companies reveals gaps in understanding the specific drivers of social media usage in the artisanal domain, especially in the Algerian context. Given the potential for digital marketing to increase the commercial viability and competitiveness of Algeria's culturally vital handicraft sector, an evaluation focused on the province of Setif could illuminate these adoption gaps. Assessing current social media usage levels and associated drivers, specifically among Setif's handicraft businesses, can provide targeted knowledge to guide strategic policies aimed at promoting social media adoption in this region. Therefore, the present study seeks to address the following research questions related to Setif's handicraft sector:

- To what extent do traditional and handicraft industry managers practise social media marketing?
- Do traditional and handicraft industry managers perceive the importance of social media marketing?
- Does the perceived degree of importance (use, age, and experience) influence crafters' use of social media for marketing their products?

To address the above questions, the following hypotheses have been formulated:

- *Hypothesis 1:* The level of social media use by traditional and handicraft companies for marketing their products is low.
- *Hypothesis 2:* Traditional and handicraft managers' perceived degree of the importance of social media marketing is low.
- *Hypothesis 3:* The level of social media use by crafters for marketing their products is influenced by the perceived degree of importance (use, age, and experience).

Methodology

The study population consisted of managers of traditional and handicraft industry companies in the province of Setif in Algeria. A questionnaire was designed

to assess the extent to which these companies utilise social media platforms for marketing their products. The study employed a random sampling technique, distributing the questionnaire to 123 individuals (managers of traditional and handicraft industry companies) who constituted the study sample.

Data collection was conducted over two months (December 2023 to January 2024) through direct communication or telephone contact with the study sample members. It's noteworthy that the telephone information was obtained from a database belonging to a governmental entity responsible for small companies.

A total of 134 questionnaires were distributed, resulting in 123 valid responses, yielding a response rate of 91.79%. The sampling frame was based on a database of registered traditional and handicraft businesses in Setif province, obtained from a governmental entity responsible for small companies.

Regarding data analysis, the SPSS software was utilised. The questionnaire items employed a 5-point Likert scale, and an ordinal scale was used to assign meaning to the mean scores to interpret the results during the analysis phase. Table 1 illustrates the ordinal scale of importance used.

Table 1

Scale for assessing the relative importance of questionnaire items

Mean	Importance Level	Importance Level	Relative Importance
1.00 – 1.79	Never	Strongly Disagree	Negligible Importance
1.80 – 2.59	Rarely	Disagree	Slight Importance
2.60 – 3.39	Sometimes	Undecided	Moderate Importance
3.40 – 4.19	Often	Agree	Important
4.20 – 5.00	Always	Strongly Agree	Very Important

Source: Authors

Descriptive statistical techniques were utilised, including percentages to describe the characteristics of the study sample, and means and standard deviations to describe the study items.

One-sample t-test was applied to check the first and second hypotheses by comparing sample means against the neutral midpoint (3.00) of the 5-point Likert scale.

Analysis of Variance (ANOVA) was employed to test the third hypothesis. Simple regression analysis was employed to isolate and examine the direct and separate influence of each specified independent variable, including 'perceived importance' of 'use', 'age', and 'experience' with social media on the dependent variable (level of social media utilisation), and directly addressing the individual components of the third hypothesis. On the contrary, multiple regression could analyse combined effects and interactions between variables, so simple regression is the suitable. It is noteworthy that the 'perceived importance of experience' with social media was measured as the 'Years of Usage'. To ensure the reliability of the instrument, Cronbach's alpha was used to measure the degree of credibility and consistency in the responses of the study sample to the items in the questionnaire.

Validity and Reliability

To ensure the validity of the questionnaire, an initial version was presented to two experts in the field for review. They were asked to provide their opinion on the extent to which each item belonged to the domain it was categorised under, the soundness of the linguistic phrasing, and the clarity of meaning. Based on the suggestions received, necessary modifications were made to the questionnaire items until the final version was achieved. The researchers considered this process and the accompanying revisions as sufficient evidence of validity for the study.

To verify the reliability of the questionnaire, the internal consistency method was used by calculating Cronbach's alpha coefficient. The reliability coefficient (alpha value) for all items in the questionnaire was 77.60%, which means that the questionnaire is suitable and that we can proceed with conducting the study.

The study sample (Table 2) exhibits notable diversity, encompassing individuals of both genders, spanning various age groups, educational levels, professional qualifications, and varying degrees of experience. Additionally, the participants engage with various popular social media platforms, predominantly Facebook, with a staggering 95.22% usage rate, aligning with the findings of previous studies.

Furthermore, the respondents possess considerable experience in using social media, whether in terms of the number of years or weekly browsing frequencies. This extensive familiarity enhances the credibility and

reliability of their perspectives, consequently lending greater validity to the obtained results.

Table 2
Sample characteristics

Characteristics	Data (%)
Gender	Male: 80.48; Female: 19.52
Age	Less than 30 years: 53.23; 30 to 40 years: 29.03; Over 40 years: 17.74.
Educational Level	Illiterate: 2.43; Primary: 12.19; Intermediate: 43.90; Secondary: 37.39; University: 4.09.
Professional Training	Government Training: 41.46; Private Training: 26.01; No Training: 19.51; Mixed Training: 13.02.
Years of Experience in the Industry	Less than 5 years: 15.44; 5 to 10 years: 53.66; More than 10: years 30.9.
Social Media Platform Used	Facebook: 95.22; YouTube: 81.60; Instagram: 75.13; Twitter: 09.05; LinkedIn: 17.25; WhatsApp: 62.20.
Years of Usage	Less than a year: 0; One to two years: 1.62; Three to five years: 27.64; More than 5 years: 70.74.
Weekly Browsing Average	Less than 2 hours: 0; 2 to 4 hours: 09.75; 5 to 7 hours: 30.89; More than 7 hours: 59.36.

Source: Authors' calculation

Results and Discussion

Descriptive Statistics

An examination of data presented in Table 3 reveals that personal communication with friends remains the primary use of social media for the sample (mean = 4.38, 'Always'), reflecting its broader societal role. Moreover, the mean score of 4.02 for Item 1 suggests that the respondents frequently engage with these platforms for recreational purposes. The presence of dedicated channels and groups that provide subscribers with entertaining programmes and advertisements contributes to the amusement and leisure aspects of these media.

However, the results demonstrate that the use of social media extends beyond mere communication with friends and entertainment. It encompasses professional and marketing dimensions, as reflected in the mean score of 2.74 for Item 4. This implies that, while not a consistent practice, there is occasional use ('Sometimes') of social media for marketing objectives among the respondents.

Some respondents refrain from utilising these platforms

for marketing due to customers' limited adoption of e-commerce. In contrast, the remaining respondents leverage social media for this purpose, particularly benefiting from promotional tools such as online marketplaces and free commercial pages. These features enable businesses to reach a broader audience of potential customers. Social media platforms significantly facilitate business-to-consumer (B2C) marketing processes within the traditional industries sector, in addition to offering paid promotional opportunities.

The mean score of 2.12 for Item 3 suggests that the respondents rarely employ these platforms to search for raw materials. This can be attributed to the existence of established suppliers upon whom traditional industry entrepreneurs have historically relied in their respective fields. It is noteworthy that the Algerian market does not heavily rely on social media for business-to-business (B2B) operations. Consequently, traditional industry companies that are the subject of this study may not find offers for their required raw materials with the desired specifications on these platforms.

Table 3

Uses of social media

Paragraph	Weighted Average	Standard Deviation	Importance
1 Entertainment and leisure	4.02	0.096	Often
2 Connecting with friends	4.38	0.052	Always
3 Searching for raw materials	2.12	0.096	Rarely
4 Marketing the company's products	2.74	0.069	Often

Source: Authors' calculation

Table 4 shows a strong focus on using social media for promotion (mean = 4.59, 'Always') by the respondents who have engaged in marketing through social media. A prominent promotional strategy involves placing advertisements within social media groups, particularly via platforms like Facebook, to reach large local audiences within Setif province alone, thereby amplifying the reach of their promotional efforts.

Despite this, the concept of customer feedback appears less prominent among the respondents. Their interest in subscribers' opinions regarding their products is somewhat inconsistent, as reflected by the mean score of 2.93 for Item 6. The primary motivation behind considering these comments is to track orders or enquire about product availability and pricing, rather than seek

insights for product improvement, as corroborated by the low mean score (mean = 2.07, 'Rarely') for Item 7.

Furthermore, the results reveal that the study sample's mean responses suggest that social media platforms are often employed to increase subscriber awareness of the company's products (mean = 4.09), either to reach potential new customers or to remind existing clients about their offerings. Additionally, these platforms are consistently utilised ('Always') to attract new customers (mean = 4.44). These findings align with the results about the use of social media for promoting the company's products, as the primary objective of these companies is to acquire new customers.

Moreover, the results indicate that social media platforms are frequently used ('Often') to provide faster service to the company's customers and respond to their requirements (mean = 3.77). These platforms facilitate rapid communication between the company and its customers, enabling immediate responses to their requests and providing contact information for seamless interactions.

Table 4

Social media marketing practices

Paragraph	Weighted average	Standard deviation	Importance
5 Promoting the company's products	4.59	0.065	Always
6 Getting subscribers' opinions about the company's products	2.93	0.070	Sometimes
7 Getting subscribers' opinions to improve the company's products	2.07	0.086	Rarely
8 Increasing subscribers' awareness of the company's products	4.09	0.059	Often
9 To retain the company's customers	3.40	0.071	Often
10 Attracting new customers	4.44	0.085	Always
11 To provide faster service to the company's customers and respond to their needs	3.77	0.085	Often

Source: Authors' calculation

Table 5 illustrates that the study sample generally lacks an adequate understanding ('Disagree') of the importance of using social media platforms for marketing their

products. This is evidenced by the weighted mean score of 2.41 for the overall set of items. The results reveal that some companies fail to fully recognise the importance ('Undecided') of social media in obtaining sales opportunities (mean = 3.26), improving sales (mean = 2.96), and enabling entry into new markets (mean = 3.03). These companies do not seem to conduct comprehensive market studies to assess the extent of their market share expansion or contraction.

Furthermore, the study sample appears to underestimate the importance of social media platforms in reducing the cost of promotion and effectively introducing their products or accelerating the sales of their various offerings. The mean scores for other items indicate a tendency towards disagreement. These companies rely heavily on word-of-mouth for product promotion, in addition to using wholesale traders and specialised retail outlets, which hold a significant influence over the local market and the success or failure of new product launches, all independent of social media platforms.

Table 5
Sample perception of the importance of using social media in marketing products

Paragraph	Weighted average	Standard deviation	Importance	
12	Using social media helps the company to:			
13	Obtain sales opportunities	3.26	0.564	Undecided
14	Improve its sales	2.96	0.865	Undecided
15	Enter new markets.	3.03	0.925	Undecided
16	Reduce the cost of introducing the company's products.	2.00	0.556	Disagree
17	Market high-profit products.	2.13	0.954	Disagree
18	Accelerate the marketing of the company's new products.	2.47	0.920	Disagree
19	Promote the company's products properly.	2.58	0.786	Disagree
20	Reduce the time needed to sell the product.	2.49	0.915	Disagree
21	Reinforce the company's brand more in the market.	1.78	0.790	Strongly Disagree
Total	2.41	0.543	Disagree	

Source: Authors' calculation

This disconnection from social media can be attributed to several factors. Some respondents do not use social media platforms at all due to a lack of technological proficiency or a lack of interest in marketing functions. Certain companies still adhere to a sales-oriented approach rather than a marketing-oriented one, as evidenced by the results about the recognition of the importance of social media in establishing a stronger brand presence in the market (mean = 1.78, 'Strongly Disagree'). These companies do not invest in developing and solidifying their brand identity in the markets they operate in, instead relying heavily on traditional methods to increase profitability. The homogeneous nature of their products, which in some cases may not even bear any branding, particularly in the case of food products sold conventionally, has contributed to this traditional and narrow approach to company management.

Testing Hypothesis 1 and Hypothesis 2

The first and second hypotheses are tested using a one-sample t-test of Student. Based on the results in Table 6, a one-sample t-test compares the mean usage level for marketing (mean = 2.74) against the scale midpoint of 3. The difference was statistically significant at 1%, indicating a moderate level of usage. Therefore, Hypothesis 1, stating that the level of social media use by traditional and handicraft companies for marketing their products is low, is not valid.

Table 6
One-sample t-test results for Hypothesis 1

Statement	Weighted Average	Standard Deviation	t	Sig.
The use of social media by traditional and handicraft companies for marketing their products	2.74	0.813	31.748	0.000

Source: Authors' calculation

Based on Table 7, where a one-sample t-test compares the mean perception of importance (mean = 2.41) against the scale midpoint of 3. The difference was statistically significant at 1%, indicating a lower perception than neutral, tending towards disagreement. Therefore, Hypothesis 2, stating that the perceived importance of social media marketing by traditional and handicraft managers is low, is valid.

Table 7*One-sample t-test results for Hypothesis 2*

Statement	Weighted Average	Standard Deviation	t	Sig.
Study sample's perception of the importance of using social media for marketing products	2.41	0.822	34.115	0.000

*Source: Authors' calculation***Testing Hypothesis 3**

The third hypothesis is tested by verifying the following sub-hypotheses:

- Hypothesis 3.1: The level of social media use by traditional and handicraft companies for marketing their products is influenced by the perceived degree of importance of use.
- Hypothesis 3.2: The level of social media use by

traditional and handicraft companies for marketing their products is influenced by the age variable.

- Hypothesis 3.3: The level of social media use by traditional and handicraft companies for marketing their products is influenced by the experience with social media.

For Hypothesis 3.1, the regression coefficient shown in Table 8 demonstrates a statistically significant (at 1%) positive influence of the degree of awareness concerning the importance of social media utilisation on the level of adoption of these platforms for marketing purposes. Additionally, the awareness of utilisation importance explains 59.5% of the variance in social media platforms use for product marketing among the traditional and handicraft companies surveyed. Consequently, it can be concluded that the degree of awareness regarding the importance of utilisation exerts a strong influence on the level of adoption of social media platforms for product marketing purposes by traditional and handicraft companies.

Table 8*Regression results for Hypothesis 3.1*

R	Adjusted R ²	ANOVA		Constant			Regression Coefficient		
		F	Sig.	Value	t	Sig.	Value	t	Sig.
0.635	0.595	160.110	0.000	1.458	5.384	0.000	0.518	15.632	0.000

Source: Authors' calculation

For Hypothesis 3.2, Table 9 reveals a statistically significant (at 1%) negative influence of age on social media platform adoption for marketing among the surveyed traditional and handicraft enterprises. Furthermore, age alone explains 29.5% of the variability

in social media usage across the sample. While significant, this suggests that age weakly influences the level of adoption of social media platforms for product marketing purposes among traditional and handicraft companies.

Table 9*Regression results for Hypothesis 3.2*

R	Adjusted R ²	ANOVA		Constant			Regression Coefficient		
		F	Sig.	Value	t	Sig.	Value	t	Sig.
0.525	0.295	35.640	0.000	3.245	7.115	0.000	-0.362	-12.542	0.000

Source: Authors' calculation

Finally, for Hypothesis 3.3, the regression coefficient in Table 10 suggests an insignificant (Sig. > 5%) influence of years of social media experience on social media adoption for marketing purposes among the surveyed

handicraft and traditional companies. Therefore, no predictive relationship can be established between crafters' social media experience and their integration of social media for promotion.

Table 10
Regression results for Hypothesis 3.3

R	Adjusted R ²	ANOVA		Constant			Regression Coefficient		
		F	Sig.	Value	t	Sig.	Value	t	Sig.
0.152	0.084	3.256	0.140	2.998	6.683	0.000	-0.123	-4.284	0.180

Source: Authors' calculation

Based on the results of the sub-hypotheses, Hypothesis 3 is partially supported. Specifically, the level of social media utilisation for marketing by traditional and handicraft companies is strongly influenced by the perceived degree of importance of use, weakly impacted by age, and not influenced by years of social media experience.

Discussion

This study provides valuable insights into adopting social media for marketing within Algeria's traditional and handicraft sector in Setif province. The results indicate a moderate utilisation of social media, primarily focused on promotion and customer acquisition rather than deeper engagement like leveraging feedback for product improvement. This suggests that while firms recognise social media's reach, its strategic marketing potential remains underutilised, which aligns partially with Charchafa and Bouchareb (2020), who found an average adoption in the same region, but our findings suggest a slightly lower usage level, perhaps reflecting ongoing challenges.

A key finding is the lower level of perceived importance managers attribute to social media marketing, which appears to be a critical barrier, as perceived importance strongly predicts adoption levels. This is consistent with research in other developing contexts highlighting limited awareness as a major challenge (Kazungu et al., 2017; Makhitha, 2016). It suggests that managers may not fully grasp how social media can address specific marketing challenges faced by the sector, such as limited distribution channels and reliance on traditional sales methods (Guettafi & Chaa, 2018; Abdeldjebar & Hadji, 2016).

The influence of demographic factors was less pronounced. The age showed a weak negative relationship with adoption, while experience with social media platforms did not predict marketing usage. This contrasts with studies suggesting digital literacy challenges (Makhitha, 2016) but implies that even experienced social media users in this context may not translate their usage into strategic marketing

applications, potentially due to the overriding factor of low perceived business value or a prevailing traditional sales-orientated mindset.

Regarding practical implications, these findings underscore the need for targeted interventions. Efforts should focus on increasing managerial awareness regarding the tangible benefits of strategic social media marketing – beyond basic promotion – such as market intelligence gathering, brand building, and customer relationship management. Workshops, training programmes focused on practical application, and showcasing success stories could be beneficial. Supporting partnerships with digital marketing service providers or e-commerce platforms could also bridge the knowledge and resource gap.

Among the limitations of this study is its reliance on a sample from one province, and its results may not be generalisable to all of Algeria's diverse handicraft sector. The data relied on self-reported measures, which may be subject to social desirability bias. The cross-sectional design limits the ability to infer causality; longitudinal studies could track changes in adoption over time. Furthermore, specific platform functionalities and the impact of specific marketing campaigns were not deeply explored. Future research could address these limitations and investigate the specific types of content and strategies that are most effective for this sector.

Conclusion

Social media presents valuable marketing opportunities for companies through enhanced product showcasing and customer engagement. This study investigated its adoption among traditional and handicraft firms in Setif, Algeria.

The findings revealed moderate adoption levels, primarily focused on basic promotional activities rather than strategic marketing integration. This echoes findings from other Algerian small businesses, suggesting a common pattern of underutilisation. Crucially, managers demonstrated low awareness of social media's strategic importance for marketing, and

this lack of awareness was the strongest predictor of limited adoption. Age had only a minor negative influence, while prior experience using social media did not translate into greater marketing application, highlighting a disconnect between personal use and business strategy.

The primary barrier identified is the gap in understanding the strategic value and potential return on investment from social media marketing. While acknowledging digital exposure's value, firms seem constrained by traditional practices and potentially limited resources or digital marketing skills.

To help this culturally important sector capitalise on digital opportunities, targeted interventions are recommended. These should focus on:

- Educational campaigns and workshops demonstrating tangible benefits (cost savings, market access, brand building) tailored to the handicraft context.
- Practical training on using social media tools effectively for marketing, customer service, and feedback collection.
- Highlighting successful examples within the local context.

This study provides preliminary evidence that Algerian handicraft firms in Setif have not yet optimised social media marketing. Future research should explore specific platform strategies, content effectiveness, and the impact of training interventions and extend the analysis to other provinces to develop more tailored recommendations for enhancing digital competitiveness and sales growth in this vital sector.

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Uporaba družabnih omrežij za trženje izdelkov v alžirski tradicionalni in obrtni industriji: primer province Setif

Izvleček

Družabna omrežja ponujajo priložnosti za tradicionalno in obrtno industrijo pri promociji izdelkov in spodbujanju prodaje. Zato ta študija preučuje obseg uporabe družabnih omrežij za trženje izdelkov med vzorcem alžirske tradicionalne in obrtne industrije. V ta namen je bil opravljen vprašalnik s 123 naključno izbranimi podjetji v provinci Setif. Rezultati so pokazali zmerno uporabo družabnih omrežij za trženje izdelkov ter nizko ozaveščenost o njihovih koristih. Raven uporabe je močno povezana z ozaveščenostjo, medtem ko starost skorajda ni imela vpliva. Izkušnje z družbenimi omrežji niso napovedovale njihove uporabe za trženje. Ugotovitve kažejo, da lahko ta sektor še dodatno izkoristi potencial družabnih omrežij z večjo ozaveščenostjo vodij o njihovih prednostih in z razvojem strategij za povečanje uporabe. Nadaljnje raziskave naj opredelijo konkretne ukrepe, ki jih lahko tradicionalna in obrtna podjetja sprejmejo za čim boljše izrabo družabnih omrežij pri promociji izdelkov in rasti prodaje.

Ključne besede: trženje preko družbenih omrežij, alžirska tradicionalna in obrtna industrija, trženje izdelkov

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