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THE IMPACT OF THE COVID-19 PANDEMIC ON SUPPLY CHAIN, ARTIFICIAL INTELLIGENCE, AND TECHNOLOGY COMMUNITY: THE GINI COEFFICIENT AND AN ECONOMIC GROWTH ASSESSMENT

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Abstract

The focus of this study is the digitalization of the supply chain, artificial intelligence, and human capital. It aims to contribute to the literature by addressing the gaps in this field. It also seeks to explain the relationship between supply chain, artificial intelligence, and employment in the post-Covid-19 era and in the post-technology society. Findings of the study show that vulnerabilities in the supply chain mechanism during the pandemic have affected global economic paradigms. In addition, this study examines the artificial intelligence-oriented supply chain during and after the Covid-19 era. It is important in that it associates artificial intelligence-oriented supply chain with competition, employment, and sustainability. This study is unique in that it presents the components of Covid-19's impact on the supply chain as a cluster. In the first part of the article, related literature is reviewed. In the second part, the relationship between supply chain, artificial intelligence, inflation, and real wages during the Covid-19 pandemic is explained. In the third part of the study, economic growth evaluations regarding the Covid-19 pandemic are made based on the Gini coefficient. As a result, it is worth noting that this study suggests lowering the Gini coefficient by linking the artificial intelligence- oriented supply chain to employment and development in the technology society.

Keywords ***:*** *Covid-19, Artificial Intelligence, Technology Community, Economic Growth.*

JEL Classifications ***:*** *E24, I39, J01, J21, J24, J82, P44, P46, Q01.*

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COVID-19 PANDEMİSİNİN TEDARİK ZİNCİRİ, YAPAY ZEKA VE TEKNOLOJİ TOPLUMU ÜZERİNDEKİ ETKİSİ: GİNİ KATSAYISI VE EKONOMİK BÜYÜME DEĞERLENDİRMESİ

Öz

Bu çalışmanın odak noktası tedarik zinciri, yapay zeka ve beşeri sermayenin dijitalleştirilmesidir. Bu çalışmanın amacı, ilgili alandaki çalışma boşluklarının giderilerek literatüre katkıda bulunmaktır. Ayrıca, Covıd-19 sonrası dönemde ve teknoloji toplumu ötesinde tedarik zinciri, yapay zeka ve istihdam arasındaki ilişkiyi açıklamayı amaçlamaktadır. Çalışmanın bulguları, pandemi sırasında tedarik zinciri mekanizmasındaki kırılganlıkların küresel ekonomik paradigmaları etkilediğini göstermektedir. Ayrıca bu çalışma, Covıd-19 döneminde ve sonrasında yapay zeka odaklı tedarik zincirini incelemektedir. Yapay zeka odaklı tedarik zincirini rekabet, istihdam ve sürdürülebilirlik ile ilişkilendirmesi önemlidir. Bu çalışma, Covıd-19'un tedarik zinciri üzerindeki etkisinin bileşenlerini bir küme olarak sunması bakımından benzersizdir. Makalenin ilk bölümünde ilgili literatür gözden geçirilmiştir. İkinci bölümde ise Covıd-19 pandemisi sırasında tedarik zinciri, yapay zeka, enflasyon ve reel ücretler arasındaki ilişki açıklanmaktadır. Çalışmanın üçüncü bölümünde Covıd-19 pandemisine ilişkin ekonomik büyüme değerlendirmeleri Gını katsayısına göre yapılmıştır. Sonuç olarak, bu çalışma yapay zeka odaklı tedarik zinciri ile teknoloji toplumunda, istihdam ve ekonomik gelişim arasında bağ kurarak Gini katsayısının düşürülmesini önermektedir.

Anahtar Kelimeler ***:*** *Covid-19, Yapay Zeka, Teknoloji Toplumu, Ekonomik Büyüme.*

JEL Sınıflandırması ***:*** *E24, I39, J01, J21, J24, J82, P44, P46, Q01.*

INTRODUCTION

The transformation of labor force and employment into human capital is necessary for the sustainability and efficiency of the environment, economy, politics, and social life. Artificial intelligence-oriented supply chains developed and used by human capital are required to get the economy back on track and for growth to become permanent and inclusive. However, today the supply chain is considered in relation to competitiveness, production, employment, and human capital. Furthermore, the use of technology in the supply chain has a positive impact on competition, production, and employment sustainability. Artificial intelligence-driven digitalization is being activated in response to supply chain vulnerabilities. The use of artificial intelligence technologies, particularly in the Covid-19 era, allows the supply chain to have a greater impact on sustainable economic growth.

Artificial intelligence (AI) is defined as "a machine's ability to imitate intelligent human behavior" or "an agent's ability to achieve goals in a variety of environments." On the other hand, the use of artificial intelligence raises some questions/problems in terms of employment and other economic paradigms, which must also be addressed. What happens, for example, if artificial intelligence enables the automation of a growing number of tasks previously performed by human labor? However, artificial intelligence can be used in the production of everyday goods and services, and it has the potential to impact economic growth and income distribution. Nonetheless, the fact that artificial intelligence is altering the process that we have created with novel ideas and technologies aids in the solution of complex problems, and the scaling up of its creative effectiveness exposes the technology society to an open-ended development process. At advanced levels, AI is expected to be able to rapidly improve itself, leading to "singularities" such as infinite machine intelligence and/or infinite economic growth.

The importance of supply chain and the human capital-oriented relationship of artificial

intelligence in the technology society are discussed in the first part of this study within the context of the relevant literature. Furthermore, how will the Gini coefficient be affected in the technological society, particularly in developing and underdeveloped countries? The impact of the pandemic on supply chains is presented in the form of a cluster in the second part of the study, which establishes a link between supply chains, artificial intelligence, inflation, and real wages in the Covid-19 era. The third part evaluates the Gini coefficient and economic growth during the pandemic using data from OECD countries. As a result, the development and application of artificial intelligence technologies led by human capital are expected to have an impact on supply chains, employment, economic growth, and a variety of other variables during and after the Covid-19 pandemic.

I. LITERATURE

A supply chain is a system of organizations, people, activities, information, and resources involved in the transportation of a product or service from the supplier to the customer. A supple chain is designed to maintain the quality of the goods during the entire shipment process.

In the supply chain, the overall performance, which has an impact on enterprises, affects employment as well. Employees in a supply chain represent human capital at the same time because they aim to improve their levels of knowledge (Singsa et al., 2019: 2982–2989). Enterprises in a supply chain face problems in regard to organizational change due to non- compliance with performance-related signs in the era of the Covid-19 pandemic. On the other hand, it is emphasized that cultural characteristics, transformational leadership, and technological change play significant roles in achieving operational excellence in the supply chain. (Sriyakul et al., 2019: 2967–74). The acceleration of the technology society and supply problems in the Covid-19 era bring public finance imbalances, inequalities, and the risk of poverty (Yeganeh, 2021: 188–209; Stiglitz et al., 2020: 240; Albanico, 2020). The uncertainties caused by the pandemic, on the other hand, lead to vulnerabilities in the supply chain, which in turn cause social and economic problems (Jorda et al., 2020; Budhwar & Cumming, 2020: 441; Beech & Anseel, 2020: 917–919; Van Barneveld et al., 2020: 133–153).

In the technology community, artificial intelligence and human capital are also expected to play a constructive role in improving the supply chain and other social and economic variables against the coronavirus (Naude, 2020: 1–10; Barua, 2020; Bofinger et al., 2020: 259–265; Broad, 2020; Caligiuri et al., 2020; Chen, 2020: 120072; Kummitha, 2020: 101481). At the same time, supply chain managers must ensure that their employees have access to the education and training resources they require to strengthen their roles in all supply chain activities (Young, Nyaga, Zepeda, 2016: 30–47). On the other hand, accurately directing the thinking skills of supply chain management staff ensures the long-term viability of production networks and promotes an overall healthy and rational working environment. As a result, training programs are designed to provide employees in the supply chain with improved problem-solving and critical thinking skills, as well as increased creativity and social skills. These programs benefit human capital by increasing employees' overall awareness and assisting them in improving their thinking processes. Therefore, human capital enables supply chain employees to develop proactive approaches (Fomina et al., 2019: 930–938). In particular, the importance of human capital is growing in the Covid-19 process in terms of avoiding procurement issues, preparing employees for potential crises, and taking proactive approaches. At the same time, it is stated that there is a positive relationship between human capital working culture and participation in supply chain management (Amin, Zailani, Khalilurrahman, 2020).

The changing nature of global production and distribution processes, as well as their impact on the capital-labor relationship, raises a number of labor process analysis questions. Power relations between multinational corporations (MNCs) and leading companies are critical in the international supply chain. At the same time, the fact that labor has bargaining power at the production stage (in

terms of revealing talents) reduces supply chain costs or is the reason they do not rise (Coe, Dicken, Hess, 2008: 271–295). Although there is no holistic theory for analyzing international supply chains, it is asserted that perspectives developed about the entire global commodity chain (GCC), global value chain (GVC), and global production networks (GPN) contribute to labor force analysis. This contribution is related to the nature of managerial control systems and labor mobilization ability (Robinson and Rainbird: 2013:91-107). Furthermore, the transformation of labor capabilities into human capital accelerates technological developments.

Enterprises in the technology community have been undergoing a digitalization transformation as part of the glocal process. The second waves of the industrial revolution, which began in the early nineteenth and twentieth centuries, resulted in a rapid increase in demand, which accelerated the mechanization of supply. Concerns have been raised, however, about the increasing nature of technological change for the low and unskilled workforce. With the "technological unemployment theory," John M. Keynes proposes that technological change causes job loss (Keynes, 1937: 209–223). These technological advancements are expected to result in job losses or job polarization, which will have a negative impact on income and wealth. Some researchers, on the other hand, believe that advances in robotics and artificial intelligence have reached a tipping point. As a result, digital applications in the supply chain are being developed in the same way that they are in other areas. However, the impact of these artificial intelligence applications on employment is a major concern (Chandra, Gupta, Agarwal, 2020: 344–350).

The Covid-19 era health problems are giving impetus to digitalization. Due to this, the enterprises-organizations that make up the digitalization infrastructure in the supply chain are gaining more and more competitive power. However, the use of the Artificial Intelligence Technology of Supply Chain (AITSC)[2] is becoming increasingly important. Artificial intelligence is becoming the enabler of a supply chain related to complex new data in the Covid-19 pandemic. As a result, in order to overcome the challenges that arise in the supply chain during the Covid-19 process, artificial intelligence is viewed as a critical tool for improving operational performance and efficiency. However, the demand for human capital that integrates supply chain networks, makes decisions, optimizes operations, and develops intelligent software is gradually increasing. Simultaneously, human capital, which employs control and automation technologies in the supply chain, plays a complementary role as an integral component of this chain.

Human capital that develops artificial intelligence will be the key to achieving future goals for sustainability, environmentalism, labor in the supply chain, and many other areas in the technology community. Simultaneously, it is expected that the technology community's workforce will be directed toward jobs in the fields of artificial intelligence, which will form the backbone of employment. The transformation in young and flexible employment has an impact on the socioeconomic future, particularly in the working world of artificial intelligence and automation. Robots and artificial intelligence are putting pressure on companies and differentiating the business world in this context. Companies with an online sales network but no actual production activity (such as Trendyol, Amazon, and others) can, for example, outperform very large companies involved in actual merchandise production. Companies across all industries are preparing for the next wave of automation by testing new robots and intelligent software. Many employees are also concerned, as companies hope that new technologies will make upcoming tasks faster, more efficient, and less expensive. According to an OECD study, one out of every five jobs in Germany can be taken over by a robot, indicating that low-skilled jobs are especially vulnerable (Kaiser, 2018). As a result, the question of what will happen if the next wave of digitalization destroys more jobs than it creates is raised.

Artificial intelligence causes creative destruction by stimulating economic growth, creating new jobs and employment. The mechanism of destruction is a replacement effect; new technology will replace old technology, and as a result, old technology jobs will inevitably lead to unemployment. At

[2] Coined by the author, this term is being used for the first time in this paper.

the same time, technological developments can reduce costs and increase resource efficiency, while the saving effect of the innovation process can lead to a high level of unemployment. However, as the need for human capital increases with new technologies, the demand for labor force also causes the transformation of employment in this direction.

Solving unsolvable problems in the supply chain with artificial intelligence technologies eliminates vulnerabilities in the supply chain, which leads to an increase in productivity. On the other hand, the use of artificial intelligence technologies in the supply chain provides flexibility. Flexibility strengthens the immune system of the supply chain (Cui, 2015: 404–414). The stronger this immunity is during and after the Covid-19 pandemic, the more robust and stable is the supply chain. In addition, the experiences gained in increasing supply chain durability create synergy. At the same time, the operation of the supply chain is becoming simpler and safer due to the accumulation of information and network technology that is progressing during the establishment of the supply chain. This increases the degree of customer satisfaction and leads to sustainable supply and demand. As a result, the development of the supply chain with artificial intelligence technologies, led by human capital, is critical in terms of sustainability, efficiency, and economics.

Supply chain enterprises, like those in other industries, are impacted by digital technological advancements in the technology community. The digitalization model in today's technology society is powered by artificial intelligence technology. As a result, the demand for human capital to develop, use, and manage these technologies is growing by the day. This situation causes a transformation in the labor force and employment. On the other hand, there is the issue of labor exclusion from employment because it cannot be included in this human capital potential, or of labor being inevitably trapped in low-wage jobs. As a result, the question of how the Gini coefficient will be affected in the technology community, particularly in developing and underdeveloped countries, is being raised.

I.I. Supply Chain, Artificial Intelligence, The Relationship Between Inflation and Real Wages in The Covid-19 Era

The social, economic, and health-related consequences of the Covid-19 process are having a wide-ranging impact on the glocal technology community. The fact that the pandemic is causing supply chain disruptions affects all other economic variables. In summary, the impact of the Covid-19 pandemic on the supply chain is formulated and presented for the first time in this study as follows:

The Effect of the Covid-19 Pandemic on the Supply Chain: {Micro economics (business and market level: supply-demand-cost), macro economy (employment, purchasing power, real wages, inflation, economic growth, national income, the Gini coefficient) international economy (exports-imports), labor economics (the transformation of employment, human capital digitalization–technology community-artificial intelligence), Energy Economics}

The emergence of vulnerabilities in the supply chain as a result of the Covid-19 process's impact has resulted in contractions in export-import, production, and employment. On the one hand, this situation causes cost inflation and demand inflation, while negatively impacting national income and the Gini coefficient. Simultaneously, as the Covid-19 process accelerates digitalization, there is an increase in human capital requirements and wages. However, the exclusion of non-human-capital employees from employment or their employment at low wages exacerbates income distribution inequalities.

Artificial intelligence technologies are being used effectively in the supply chain to control supply and demand management. However, due to several factors in the Covid-19 pandemic process, such as restrictions, there have been partial closures and job cuts in companies that failed to form an artificial intelligence-oriented technological supply chain. However, border restrictions, quarantines, and delivery delays all have an impact on international trade, causing disruptions in the supply chain. In this era of the Covid-19 pandemic, supply chain vulnerabilities and other issues are reflected in factor prices, resulting in cost inflation. On the other hand, the fact that some sectors' production

contractions result in a supply shortage and a demand surplus is a cause of demand inflation. The coexistence of cost inflation and demand inflation reduces real wages and purchasing power by keeping total inflation above the wage earners' rate of increase.

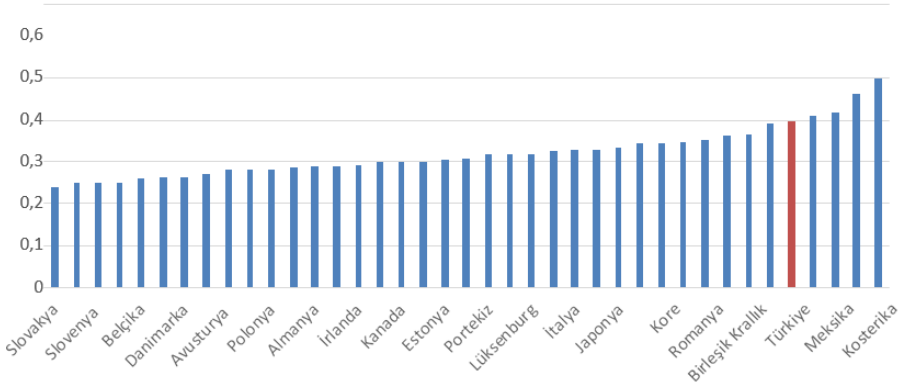
The fact that the Covid-19 pandemic caught the supply chain off guard has had an impact on employment, inflation, real wages, purchasing power, national income, and other economic factors. As a result, it is expected that The Artificial Intelligence Technology of Supply Chain (AITSC), which is based on artificial intelligence, will eliminate vulnerabilities and reduce costs over time while increasing productivity. At the same time, the efficiency of the supply chain contributes to the sustainability of employment and the economy (Moser, 1993: 79–92). Flexible supply chain changes with an emphasis on artificial intelligence, on the other hand, have an impact on local, national, and global economic development (Chris & Kaine, 2015: 483–501).

In the technology community, blockchain is a new distributed information technology that is evolving and constantly expanding from Bitcoin, the first crypto currency. However, it is asserted that the potential of blockchain as a technology that can reduce the importance of the power structures of global companies may go untapped (Dujak & Sajter, 2018: 21–45). However, blockchain technology facilitates the resolution of trust issues and the exchange of information in supply networks. The incorporation of blockchain into the supply chain will enable it to ensure the visibility, transparency, and reliability of product flows. On the other hand, achieving this goal by integrating blockchain into the supply chain, thereby making it useful and creating an economic system unique to the management of a blockchain-based supply chain, involves a number of challenges (Azzi, Chamoun, Sokhn, 2019: 582–92). Human capital and artificial intelligence are critical in overcoming the challenges associated with this.

In the technology society, wage disparities between human capital and non-human capital labor force affect the Gini coefficients countries. As a result, the OECD recommends that countries boost human capital ratios in their education and training systems, as well as in the labor force. Economists often refer to this as "the improvement of human capital." Nevertheless, quantifying the effects of human capital on growth and productivity at the macroeconomic level has often proven difficult, both in academic literature and in OECD studies.

I.II. Evaluation of The Gini Coefficient and Economic Growth in The Covid-19 Process

Personal income distribution refers to the distribution of income generated in an economy among its citizens. The Gini coefficient is the most commonly used tool for measuring fairness in the distribution of personal income. The Gini coefficient is a coefficient ranging from zero to one, and shows that as it approaches zero, income distribution equality increases, while it shows an increase in income distribution inequality as it approaches one. Income is defined as a household's disposable income in a given year. Earnings, self- employed income, and capital income, as well as cash public transfers, are included in income, and income taxes and social security contributions paid by households are deducted. The income of a household is attributed to each of its members, with a correction to account for the differences in needs between households of various sizes. The "Gini coefficient" measures income inequality between individuals. The Gini coefficient, which ranges from 0 in the case of perfect equality to 1 in the case of perfect inequality, is based on a comparison of the cumulative ratios of the income they earn and the cumulative ratios of the population. As a result, the greater the Gini coefficient, the greater the income inequality.



Graphic 1. The Gini Coefficients of Some Countries

Source: https://data.oecd.org/inequality/income-inequality.htm (Last accessed:11.10. 2021).

The Gini coefficients of some countries are ranked in the graph above, from countries with a more equitable income distribution (closer to zero) to countries with a more unequal income distribution (closer to one). Only two countries have a higher Gini coefficient than Turkey, according to Graph 1, and these are Mexico and Costa Rica. However, the Gini coefficients of Chile and South Africa, which are not included in Graph 1, are higher than Turkey's. Furthermore, according to an OECD study based on the most recent calculations for 2019, Turkey is the fifth most unequal country in terms of income distribution among OECD countries. Northern countries (Gini coefficient between 0.25 – 0.30) and some former socialist countries (Gini coefficient between 0.28 – 0.33) have the best income distribution. According to OECD data, however, the United States, Latin America, and South Africa are all worse than Turkey in terms of income distribution inequality.

Table 1. 2010-2019 Distribution of Income in Turkey by Year

Reference year of income	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
The ratio of P80/P20	8.0	8.0	7.7	7.4	7.6	7.7	7.5	7.8	7.4	8.0
The ratio of P90/P10	1.44	14.2	13.6	12.6	13.3	13.6	13.4	13.7	13.0	14.6
The Gini Coefficient	0.404	0.402	0.400	0.391	0.397	0.404	0.405	0.408	0.395	0.410

Source: https://data.tuik.gov.tr (Last accessed: 10.10.2021)

The Gini coefficient, which was announced by TURKSTAT in Turkey in 2019 as 0.395, demonstrates that the income distribution is quite unequal. In the same year, the average income of the poorest 20% of the population was 7,4 times lower than that of the richest 20%. In contrast, the coefficient was 0.408 in 2018, indicating a slight improvement due to increases in the minimum wage and transfer payments.

The Gini coefficient in Turkey has been around 0.40 for the last ten years, according to Table 1. The best year for income distribution is 2013, with 0.391, and the worst year for income distribution is 2019, with 0.41. Inadequate human capital is also responsible for the fact that the lowest income group earned eight times less than the highest earning group. Aside from a lack of human capital, other factors that affect income distribution inequality include high unemployment rates, a constant depreciation of the national currency, and high inflation rates. Negative changes in the Covid-19 era,

such as rising unemployment and wider wage disparities, are expected to have a negative impact on the Gini coefficient.

Table 2. Changes in GDP growth in G20 countries (%)

	2020	2021	2022		2020	2021	2022
World	-3.5	5.8	4.2	**G20**	-3.1	6.3	0.7
Australia	-2.5	5.1	0.75	Argentina	-9.9	6.1	1.8
Canada	-5.4	6.1	0.76	Brazil	-4.1	3.7	1.0
Euro area	-6.7	4.3	0.62	China	2.3	8.5	1.3
Germany	-5.1	3.3	0.24	India	-7.7	9.9	0.75
France	-8.2	5.8	-0.21	Indonesia	-2.1	4.7	0.89
Italy	-8.9	4.5	0.13	Mexico	-8.2	5.0	1.01
Spain	-10.8	5.9	1.1	Russia	-2.6	3.5	2.8
Japan	-4.7	2.6	-0.13	Saudi Arabia	-4.1	2.8	2.6
Korea	-0.9	3.8	0.63	South Africa	-7.0	3.8	1.94
United Kingdom	-9.8	7.2	0.75	Turkey	1.8	5.7	1.2
United States	-3.5	6.9	-0.38				

Source: OECD Economic Outlook 2020-2022 (Data for the first quarter of 2022)

Supply chain disruptions cause economic contraction in the Covid-19 era. On the other hand, the OECD report draws attention to the unevenness of economic recoveries as a result of public health measures and policy support. In order to speed up these recoveries, many developed economies are incentivizing more people to get vaccinated. In this process, businesses aim to overcome the crisis with minimal damage in the coming months by adapting to restrictions designed to prevent the virus from spreading. In these constraints, the use of artificial intelligence is becoming increasingly important.

For example, if Mercedes had switched to chipping in the production–supply chain during the Covid-19 era, it would not have experienced an employment contraction by not canceling orders. However, the absence of an artificial intelligence-driven supply chain results in factory closures. These closures have an impact on the economy at the micro, macro, and international levels, causing the global economy to contract and affecting the Gini coefficient. Economic improvements, on the other hand, are expected to remain modest in many emerging market economies where government support is limited.

Forecasts for 2021 and 2022 show an improvement in economic growth similar to previous years, as well as growth above the fourth quarter of 2019. According to OECD estimates that have proven accurate or are expected to prove accurate, global GDP growth was 5.8 percent in 2021, while the world economy returned to pre-pandemic activity levels as economic contraction returned to economic growth globally from 2020 to 2021.

However, the actual global revenue in 2022 is expected to be $3 trillion lower than expected due to the Covid-19 crisis. On the other hand, growth is expected to slow from 2021 to 2022, but at a lower rate than the rate of growth from 2020 to 2021. Because 2020 was the first year of the pandemic, supply vulnerabilities and the inability to implement health measures resulted in negative economic growth figures. With the implementation of measures aimed at mitigating the Covid-19 crisis in 2021, economic growth has returned to positive levels in 2021. However, as long as a large proportion of the global population remains unvaccinated and the risk of new outbreaks persists, the recovery will be uneven and vulnerable to new setbacks. Some targeted restrictions on mobility and activity may still be necessary, particularly for cross-border travel. This will have an impact on the chances of a full recovery in all countries, including those with rapid vaccination administration or low infection rates. In addition the Russia-Ukraine crisis has raised the cost of energy, which is one of the important inputs. Due to the covid 19 pandemic and the Russian Ukraine crisis, inflation rates are increasing in European countries. This situation causes slowdown and regression on economic growth. At the same time, there is an decline in Turkey's gross domestic product forecasts for 2022.

According to this, rate of increase is lower than before COVID 19, like many other countries.

Currency depreciation, on the other hand, creates uncertainty and risk. The relative importance of sectors such as public health strategies, vaccination speed, financial and monetary support, and tourism is the driving force behind differences between countries. While Korea and the United States have already returned to pre-pandemic income levels, the majority of Europe is expected to take another year. In Mexico and South Africa, it is expected to take three to five years. Although the risks have become more balanced in terms of potential positive and negative impacts, forecasts are still fraught with uncertainty.

In Turkey, as household total income increased in Turkish lira terms, income distribution inequality increased as the share of high earners increased while the share of low earners decreased. In comparison to the previous year, the share of the 20% group with the highest equivalent household and individual income in total income increased by 1.2 percent to 47.5 percent. The share of the 20% with the lowest income fell by 0.3 percentage point to 5.9 percent. This situation demonstrates that as the Covid pandemic has accelerated digitalization, human capital has increased its share of income. On the other hand, the fact that the undereducated segment who are not adults has no access to latest technologies causes them to be excluded from employment or to be forced to work in low-wage jobs. This implies that the Covid-19 process increases income distribution inequality and that the Gini coefficient has an approximation effect of one (1).

The sustainability of assistance to individuals and businesses is important in the Covid -19 process. Therefore, strategies that are compatible with the current indicators of the economy's health should be implemented. As the restrictions are lifted, the assistance provided should be graded according to the areas that are most in need. Retraining and job placement programs, in particular, raise the hopes of the low-skilled and younger workforce. It is also critical that this assistance be more focused on viable businesses, encouraging them to transition from debt to equity capital and create jobs, and that it be directed toward human capital investment for digitalization. Although human capital is the primary component of this investment, no consistent measure of it has been developed.

It is also necessary to convert the assistance provided into human capital- oriented investments. Knowledge, skills, education, efficiency, learning, work experience, productivity, innovation, health, high wages, per-capita income, employment rates, economic development, duration of trainings, rates of return to training, and rates of marginal returns of education are factors determining the quality of human capital. Economists emphasize that human capital is the driving force behind economic growth. It is assumed that countries with a more educated population are more productive. What happens, however, is that workforce with more education and experience tends to earn more money (Boyev et.al, 2019: 5–26). It is asserted that in OECD countries, there is a positive relationship between human capital and innovation, as well as between personal income and productivity (OECD, 2018; Flabbi & Gatti, 2018).

The risks posed by the Covid-19 pandemic are increasing as vaccine-resistant new variants of the virus emerge. International cooperation, on the other hand, is required both medically and financially in the delivery of vaccines to low-income countries. Although public debts are rising as a result of state assistance during the Covid-19 pandemic, low interest rates make debts more manageable. Simultaneously, investments are being made in healthcare, digitalization, and climate change. As a result, the spread of vaccines and investments in these areas have a positive impact on employment. During the early stages of Covid-19, employment rates fell. However, as a result of these investments and the relaxation of restrictions, unemployment rates are returning to pre-covid levels. The inflation effect, on the other hand, is visible all over the world. The argument that debt sustainability should be prioritized only when the recovery is on track remains valid. Governments, on the other hand, must begin planning for a major overhaul of public finance management. Concurrently, post- Covid-19 pandemic crisis policies lead to more effective problem-solving.

As economies reopen, the high levels of household savings accumulated during the crisis are

expected to push consumption and growth to higher-than-expected levels, particularly in developed economies. The elimination of supply chain disruptions and the release of pent-up demand have the effect of raising interest rates in tandem with demand inflation. This situation may put financial strain on vulnerable developing countries and markets. In fact, preventing interest rates from rising and lowering rates causes a decrease in the national currency in countries such as Turkey, as well as a stronger gravitation toward foreign currency.

Decreases in the value of the national currency, combined with cost inflation in foreign-dependent economies, lead to decreases in real wages and purchasing power, thereby mutating the vicious circle of inflation (decreases in the value of the national currency and in real wages) leading to a current account deficit.

The OECD observes that there will be no cycle of wage and price increases if unemployment persists. However, uncertainty and risk remain in developing and underdeveloped economies as a result of inflation, interest rates, and currency depreciation.

Vaccination and other health measures are being used to try to mitigate the pandemic's social and economic devastation. But unemployment remains a problem. In this process, while employees who are less qualified are excluded, the wages of a highly skilled workforce are increasing. However, people do expect that they will start living a normal life again. To get past a critical point in the recovery process, vaccine production and distribution should be accelerated globally, backed up by effective public health strategies.

CONCLUSION AND RECOMMENDATION

The Covid-19 pandemic's acceleration of digitalization, marked by constantly mutating virus variants, is triggering the artificial intelligence-oriented technology society. This transformation causes wage disparities to widen and income inequality to worsen. It is necessary to implement education programs and policies that will elevate nearly the entire workforce to the level of human capital. Furthermore, income taxes levied on employees earning below the poverty line should be gradually reduced. Income growth should be achieved by raising the lowest pension to the level of the minimum wage.

In countries such as Turkey, currency depreciation causes problems such as inflation, current account deficits, and falling real wages. Inequality of income distribution is exacerbated by the economy's foreign exchange imbalances, rising inflation, and indirect taxes. The factors of domestic production should be prioritized in order to reduce these inequalities. Clusters that improve human capital, technology, entrepreneurship, SMEs, exports, employment, and wages should be prioritized. At the same time, clusters are areas where entire supply chain disruptions and costs are minimized (İrhan, 2020: 529–544).

During the Covid-19 pandemic, the importance of artificial intelligence in closing deficits in economic activities has grown. (Abuselidze and Mamaladze, 2021.) As a result, social and economic policies aimed at increasing the share of human capital centered on artificial intelligence, eliminating wage disparities, and increasing the Gini coefficient should be revised.

During the Covid-19 and its mutations, the most prominent issues in the global value chain (GVC) are value added trade, employment, CO2 trade and global energy use, the economic effects of the global-local supply chain, inflation, real wage, and the Gini coefficient. The Covid-19 pandemic has reignited the debate over the risks and opportunities associated with the globally fragmented supply chain. Cost and demand inflation are both caused by supply chain vulnerabilities. As a result, since the start of the Covid-19 process, one of the most prominent issues has been inflation. The phenomenon of closures and openings causing inflation is defined as the "Inflation Paradox" in this study, laying the groundwork for the next study.

REFERENCES

Abuselidze, G., & L. Mamaladze (2021). *The impact of artificial intelligence on employment before and during pandemic: A Comparative analysis*. Journal of Physics: Conference Series- 1840-012040, IOP Publishing. DOI: 10.1088/1742-6596/1840/1/012040.

Albanico, M., Mladenov, Z., & Sharma, R. (2020). *How the COVID-19 crisis is affecting UK Small and medium-sized enterprises.* McKinsey and Company.

Amin, I., Zailani, S., & Khalilurrahman, M. (2021). Predicting employees' engagement in environmental behaviours with supply chain firms. *Management Research Review, 44*(6).

Azzi, R., Rima, K. C., & Sokhn, M. (2019). The power of a blockchain-based supply chain. *Computers and Industrial Engineering*, 135. https:// doi.org/10. 10 16/j.cie.2019.06.042.

Barua, S. (2020). Understanding coronanomics: The economic implications of the coronavirus (COVID19) pandemic. *SSRN Electronic Journal.* DOI: 10.2139/ssrn.3566477.

Beech, N., & Anseel, F. (2020). COVID-19 and its impact on management research and education: Threats, opportunities, and a manifesto. *British Journal of Management*, *31*(4).

Bofinger, P., Dullien, S., Felbermayr, G., Fuest, C., Hüther, M., Südekum, J., & Weder di Mauro, B. (2020). Economic implications of the corona crisis and economic policy measures. *Wirtschaftsdienst, 100*(4).

Botev, J., Egert, B., Smidova, Z. & Turner, D. (2019). A new macro economıc measure of human capital with strong empirical links to productivity. *OECD: Economics Department Working Papers* No:1575. https://doi.org/10.1787/d12d7305-en.

Budhwar, P., & Cumming, D. (2020). New directions in management research and communication: Lessons from the COVID-19 pandemic. *British Journal of Management, 31*(3), 441.

Caligiuri, P., De Cieri, H., Minbaeva, D., Verbeke, A., & Zimmermann, A. (2020). International HRM insights for navigating the COVID-19 pandemic: Implications for future research and practice. *Journal of International Business Studies*, 1.

Chandra, G., Gupta, R., & Agarwal, N. (2020). Role of artificial intelligence in transformating the justice delivery system in COVID-19 pandemic. *International Journalon Emerging Technologies*, *11*(3).

Chen, Z. (2020). COVID-19: A revelation – a reply to Ian Mitroff. *Technological Forecasting and Social Change*, *156*, 120072.

Coe, N.M., Dicken, P., & Hess, M. (2008). Global production networks: Realizing the potential. *Journal of Economic Geography*, *8*(3). DOI: 10.1093/jeg/lbn002.

Cui, Y. (2015). Improving supply chain resilience with employment of IoT. *Multidisciplinary Social Networks Research*, (540). https://doi.org/10.1007/978-662-48319-0_33.

Chris, W. F., & Kaine, S. (2015). Supply chains, production networks and the employment relationship. *Journal of Industrial Relations*, *57*(4). https://doi.org/10.1177/0022185615589447.

Dujak, D., & Sajter, D. (2018). Blockchain applications in supply chain. *Smart Supply Network-Springer*. DOI: 10.1007/978-3-319-91668-2_2.

Gary, J., Nyaga, G. N., & Zepeda, E.D. (2016). Hospital employment of physicians and supply chain performance An empirical investigation. *Health Care Management Review*, *41*(3). DOI: 10.1097/HMR.0000000000000074.

Flabbi, L., & Gatti, R. (2018). A primer on human capital. *World Bank Policy Research Paper*, No. 8309.

Fomina, S., Sizikova, V., Shimanovskaya, S., & Kozlovskaya, A. (2019). The effect of teaching and supply chain management on employees' skills in small and medium sized enterprises of Russia. *International Journal of Supply Chain Management*, *8*(4).

Jorda, O., Singh, S. R., & Taylor, A. M. (2020). Longer-run economic consequences of pandemics. *National Bureau of Economic Research*, (No. w26934).

Kaiser, V. T. (2018). Roboter werden in Deutschland besonders viele Jobs vernichten. *OECD-STUDIE*.

Keynes, J. M. (1937). The general theory of employment. *The Quarterly Journal of Economics, 51*(2).

Kummitha, R.K.R. (2020). Smart technologies for fighting pandemics: The techno-and human-driven approaches in controlling the virus transmission. *Government Information Quarterly, 37*(3).

Moser, T. F. (1993). Promotingn sustainable development through the enhancement and supply chain opportunities generated by energy companies. *Social Performance Management Unit.*

Naudé, W. (2020). Artificial ıntelligence against COVID-19: An early review. *IZA Discussion Paper*, No.13110,

OECD (2018). *Economic policy reforms-2018: Going for growth ınterim report*. Paris: OECD Publishing,

OECD (2020). *OECD economic outlook-2020*. Paris: OECD Publishing.

OECD (2021). *OECD economic outlook*. Paris: OECD Publishing.

Robinson, P. K., & Rainbird H. (2013). International supply chains and the labour process. *Competition and Change, 17*(1). https://doi.org/ 10.1179/1024529412Z.00000000027.

Singsa, A., Sriyakul, T., Sutduean, J., & Jermsittıparsert, K. (2019). Willingness of supply chain employees to support disability management at workplace: A case of Indonesian supply chain companies. *Journal of Computational and Theoretical Nano Science, 16*(7). https:// doi.org /10.116 6/jctn.2019.8205.

Sriyakul, T., Sutduean, J., Jermsittiparsert, K., & Singsa, A. (2019). Effect of cultural traits, leadership styles and commitment to change on supply chain operational excellence. *Journal of Computational and Theoretical Nanoscience, 16*(7). https://doi.org/10.116 6/jctn.2019.8203.

Stiglitz, J., Ahmed, F., Ahmed, N. E., & Pissarides, C. (2020). Why inequality could spread COVID-19. *The Lancet Public Health*, *5*(5).

TÜİK. Erişim Adresi: https:// www.tuik.gov.tr. Erişim tarihi: 10.10.2021.

Van Barneveld, K., Quinlan, M., Kriesler, P., Junor, A., Baum, F., Chowdhury, A., & Friel, S.(2020). The COVID-19 pandemic: Lessons on building more equal and sustainable societies. *The Economic and Labour Relations Review*, *31*(2).

Yeganeh, H. (2021). Emerging social and business trends associated with the Covid-19 pandemic. *Critical Perspectives on International Business, 17*(2). DOI: 10.1108/cpoib-05-2020-0066.

Young, G. J., Zepeda, E. D., & Nyaga G. N. (2016). Supply chain risk management and hospital ınventory: Effects of system affilition. *Journal of Operations Management*, *44*. https://doi.org/10.1016/j.jom.2016.04.002.

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