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**This is an electronic reprint of the
original article (publisher's pdf).**

Please cite the original article:

Impola, J. (2021). The logistic, economic and sustainability challenges of modern globalization revealed by the COVID-19 pandemic. In T. Klietik (Ed.), *The 21st International Scientific Conference Globalization and its Socio-Economic Consequences 2021* (article 01011). (SHS Web of Conferences 129). EDP Sciences.

<https://doi.org/10.1051/shsconf/202112901011>



The logistic, economic and sustainability challenges of modern globalization revealed by the COVID-19 pandemic

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Abstract

Research background: The COVID-19 pandemic revealed many problems in global logistics, economy and sustainability. Very long time the globalization has been seen as the motor of international development and prosperity. Because the COVID-19 pandemic the global logistics has seriously affected (for example air and sea logistics), especially European and US economies have experienced serious setback and even the global sustainability has been under turmoil.

Purpose of the article: In this article the major logistic, economic and sustainability challenges revealed by the COVID-19 pandemic during the years 2020 and 2021 will be researched and the research aims to define, how the global logistics, economy and sustainability have been affected and especially which of these changes can be seen irreversible. The world has already started the change of economic paradigm manifested by the Financial Times on September 18th 2019 in their article “Capitalism: Time for a Reset”. All the aspects highlighted by FT were catalysed by COVID-19 pandemic and now it is time to define, how we can use this experience for creation of the new globalization paradigm.

Methods: The main method of creating this article is to find and analyse recent practical information about challenges, development and solutions in logistics, economics and sustainability.

Findings & Value added: The main finding of this article is to create a holistic overview about what happened and what has been done in global logistics, economy and sustainability and how the post-COVID-19 ought to deal with globalization. The world will never return back to the status quo which was before the new economic paradigm and COVID-19, so it is necessary to understand, how our globalized world will change in the future.

Keywords: *economy; globalization; sustainability*

JEL Classification: *F01; F64; L91; Q56*

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1 Introduction

When the COVID-19 pandemic spread rapidly throughout the world during February-April 2020 it caused immediately rapid slowdown of international logistics, travelling, various companies and eventually economies of countries throughout the world. Following year (April 2020 to April 2021; Majerova et al., 2021) changed the way of consumption (Valaskova et al., 2021; Svabova et al., 2021), travelling and especially logistics in the while globalized world. Because of the significant decrease on both international trade and logistics also several positive sustainability effects appeared. Because of less industrial production, travelling and goods transportation the use of natural resources and production of harmful emissions like CO₂ were significantly cut down. Could this be the beginning of a new, more sustainable globalized world?

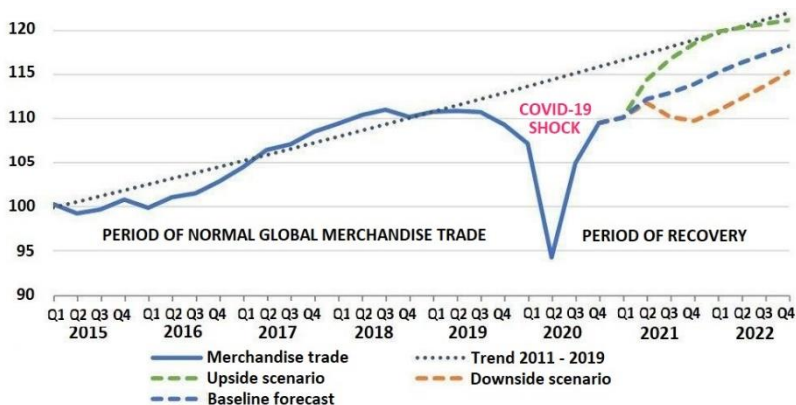


Figure 1. Global World merchandise trade volume, 2015Q1-2022Q4; Index, 2015=100

Source: World Trade Organization (2021b), edited by the author

2 Methods

The main method of creating this article is to find and analyse recent practical information about challenges, development and solutions in logistics, economics and sustainability.

3 Results and discussion

3.1 Impacts of COVID-19 to global logistics

The impact of COVID-19 to the world trade merchandise volume was really dramatic, as illustrated in Figure 2. The recovery has been also really impressive, but a full recovery compares to the pre-COVID-19 development will be achieved only in upside scenario; both baseline forecast and downside scenario will deviate from the pre-COVID-19 trend. Why?

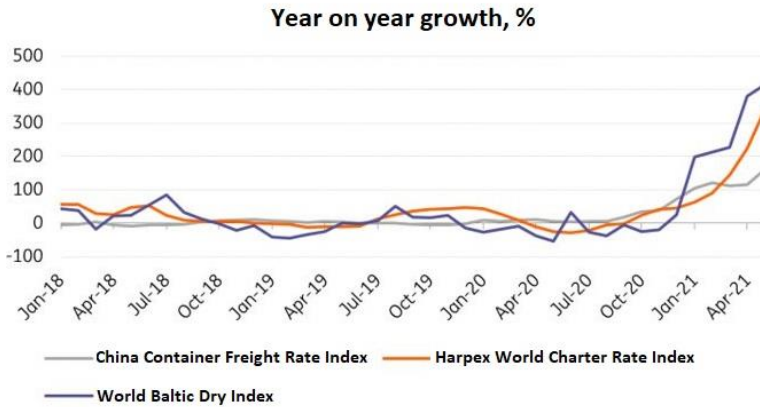


Figure 2. Impact of COVID-19 into global shipping freight cost indexes

Source: Sajjan (2021), edited by the author

Based on Figure 2. and Figure 3. it seems that the global freight volumes are hurt by significantly increased global freight costs. Of course, when the transportation costs increase three- to four-fold in about half year, it has serious impact on global trade. Another aspect that has hampered global trade is the shortage of available containers

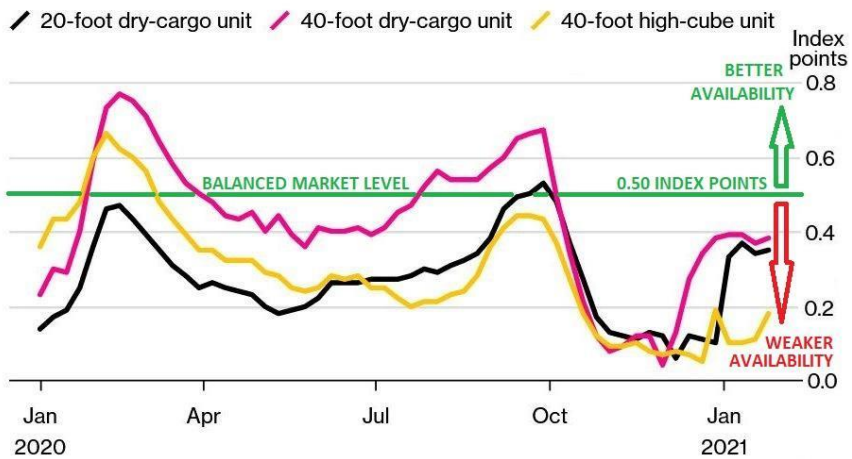


Figure 3. A global shipping-container shortage is showing signs of easing

Source: Murray (2021), edited by the author

Evidently the total impact of COVID-19 pandemic to the global logistic flows was in the beginning quite dramatic, which can be seen especially on global air traffic volumes.

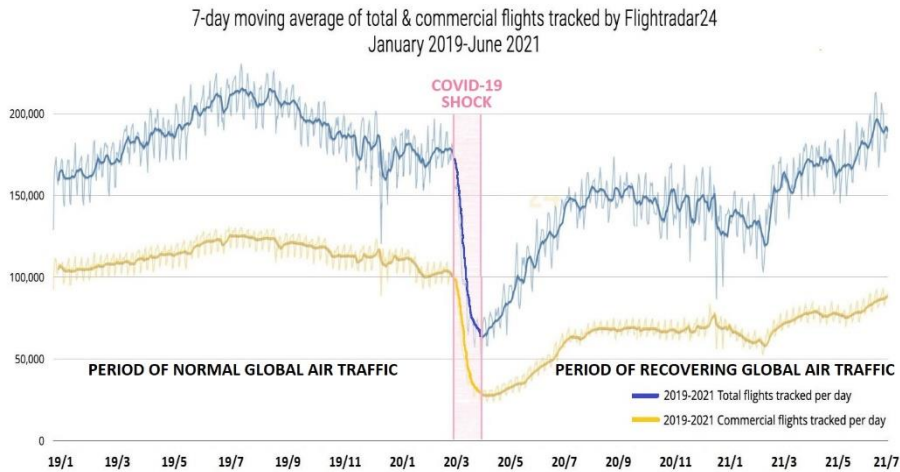


Figure 4. The world air traffic volumes from January 2019 to July 2021.

Source: Petchenik (2021), edited by the author

As seen on the Figure 3 above the impact of the COVID-19 outbreak at the beginning of March 2019 was especially drastic for the air transport industry. The total flights volume collapsed during one month from 175 000 flights per day to mere 62 000 flights per day – a drop of 65% in just one month. The volume of commercial flight collapsed from about 100 000 flights per day to 25 000 flights per day – a staggering drop of 75%. Earlier busy airports were emptied within weeks and all commercial airline companies were closing routes and grounding their airplane fleets at landslide pace. Many countries closed their borders and the free and global air traffic world was before the summer of 2019 just a fading memory. Also the goods transport by air was hurt severely, because the passenger airplanes were also carrying significant quantities of air cargo.

Especially international postal logistics was hampered badly. For example, even September 2021 it is not possible to send or receive any postal mail between Finland and Australia. The significance of air transport on global trade became painfully clear, when the COVID-19 outbreak on March 2019 halted it, but after the first shock some level of recovery has been experienced. Still the volume of passenger air traffic is far behind the pre-COVID-19 level, but it seems that the situation may change very rapidly to the positive if (and when) the COVID-19 vaccination levels increase and therefore the bans and restrictions of travelling are eased and/or lifted.

For example, in Finland the demand for vacation flights for winter 2021-2022 season is growing rapidly. The Finns are already reserving holiday and vacation trips of winter season 2021 – 2022 and summer season 2022 and there is now lots of accumulated repressed demand for holiday trips (Hyttinen, 2021). Same kind of development can be seen in all around the developed world. As soon as the travel restrictions and bans will be eased or lifted the demand and sales of holiday- and leisure flights will be soaring.

3.2 Impacts of COVID-19 to global economy

The early estimates show that the major economies have experienced at least 2,9% drop of their gross domestic product (GDP) during the year 2020. Currently the GDP loss is estimated to be 4,5%. In numbers the global GDP loss has been estimated to be about 4 trillion US\$ (Szmigiera, 2021a).

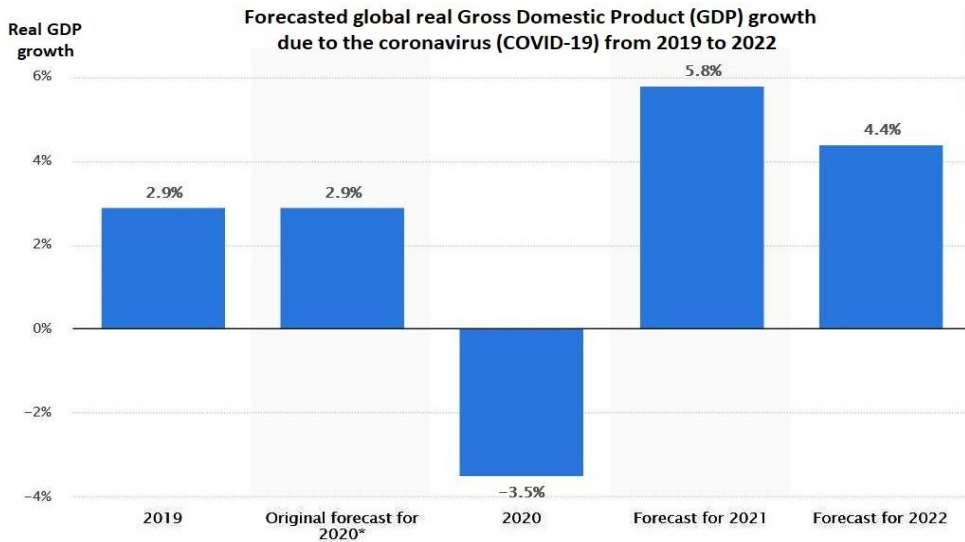


Figure 5. The impact of COVID-19 on global GDP forecasts 2019 - 2022

Source: Szmigiera (2021b), edited by the author

How this bouncing global GDP has affected global economic equality? The most disturbing outcome has been the fact, that the COVID-19 pandemic and the economic recovery has not been equal. In contrary, it seems that the global inequities have become wider the before.

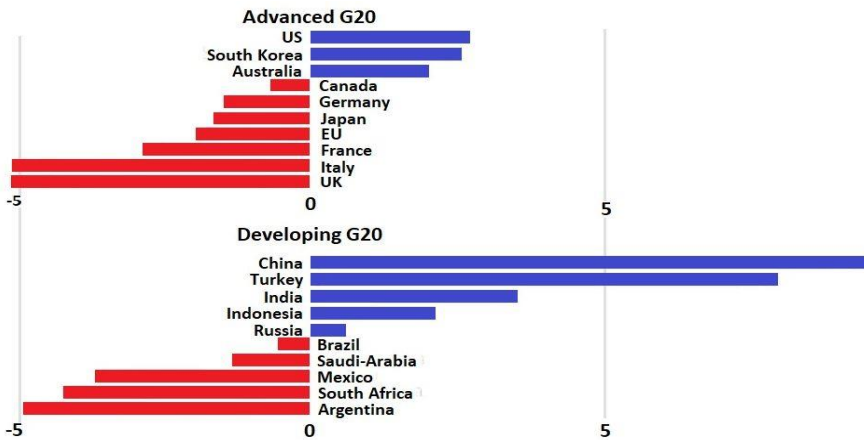


Figure 6. Forecasts for real GDP in 2021, % above 2019 level

Source: Wolf (2021), edited by the author

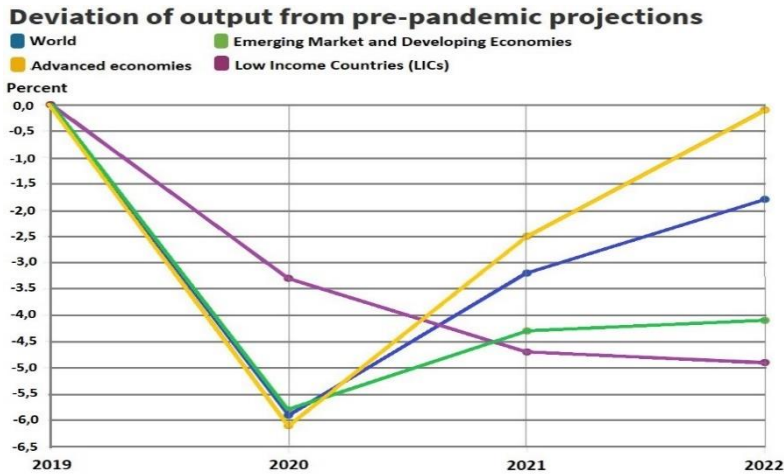


Figure 7. Deviation between the levels of June 2021 and January 2020 baseline World Bank projections.

Source: The World Bank (2021), edited by the author

The COVID-19 pandemic hit in the beginning most the Advanced economies and Low Income countries (LICs) causing about -6% deviation. Also the Emerging Market and Developing Countries (EMDEs) were hit by over -3% deviation. The biggest difference between the developed countries and LICs/EMDEs is the fact, that when the developed countries are currently recovering rapidly and fully from the COVID-19 economic shock, are the EMDE-countries experiencing only moderate recovery and the LIC-countries keep declining. The COVID-19 pandemic is hurting most the countries, which had less advantageous situation to begin with. So even because of the COVID-19 pandemic the rich countries get eventually richer and the poor countries get eventually poorer.

When measuring the inequity and its changes commonly used tool is the Gini index, which is described in Investopedia by Adam Hayes as follows (Hayes, 2021): “*Gini index or Gini coefficient, is a measure of the distribution of income across a population developed by the Italian statistician Corrado Gini in 1912. It is often used as a gauge of economic inequality, measuring income distribution or, less commonly, wealth distribution among a population. The coefficient ranges from 0 (or 0%) to 1 (or 100%), with 0 representing perfect equality and 1 representing perfect inequality. Values over 1 are theoretically possible due to negative income or wealth*”. How the pandemic effect to the global equality can be defined?

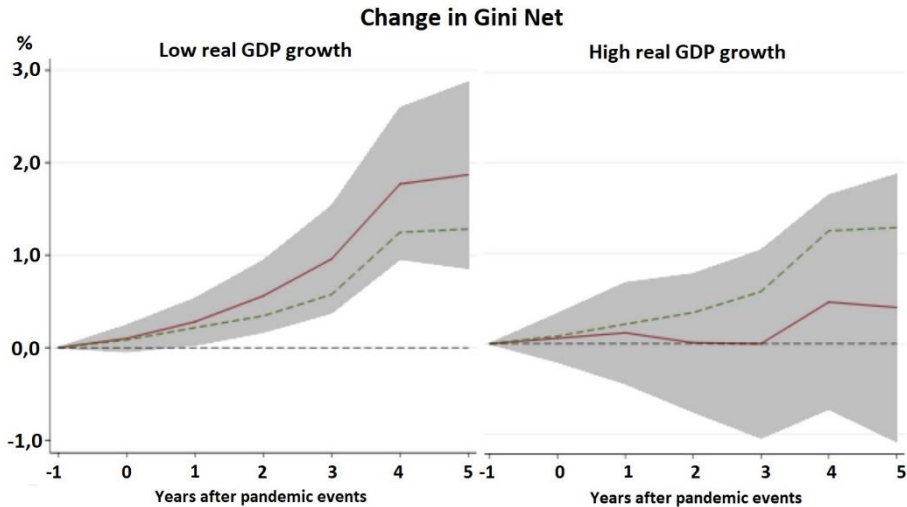


Figure 8. Changes caused by pandemic to low and high real GDP countries.

Source: Furceri et.al. (2020), edited by the author

The Figure 8. shows the impulse response (and 90% confidence bands) of the net Gini coefficient to pandemic events for a sample 175 countries over the period 1961-2017. The red line shows the response associated with very low growth (left panel) and very high growth (right panel). The dotted green line denotes the baseline average (unconditional) effect (Furceri et.al., 2020).

When using data from the World Bank's World Development Indicators – available for 64 countries – it has been found that the shares of incomes going to the top deciles increases and that to the bottom deciles falls after a pandemic event. For instance, the share of income going to the top two deciles is 46% on average, while the share going to the bottom two deciles is only 6% - a gap of 40 percentage points. Five years after the pandemic, this gap increases by 2½ percentage points (Furceri et.al., 2020). As pandemics are increasing the inequality gap between the rich and poor countries and individuals the COVID-19 pandemic seems to be doing that on a much larger scale as usual, because of the special nature and globality of it.

3.3 Impacts of COVID-19 to global sustainability

The paragraphs 2 and 3 show that the COVID 2019 pandemic had caused big, mostly negative, impacts on the global logistics and economy. How about the global sustainability, how it has been impacted by it?

As defined in author's earlier paper (Imppola, 2020), all the three pillars must be managed in order to achieve sustainability. If the challenges whose seem to be with environmental sustainability are inspected a bit deeper, usually the root causes can be found on social and/or economic sustainability. The foundation of holistic sustainability lies on the recognition, that there is no "us" or "them" - we are all living in a global homeland and only together we can improve it.

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Figure 9. Sustainability and its three pillars.

Source: Imppolo (2020)

It seems that positive sustainability hopes fuelled by the dramatic drop of global CO₂ emissions during the first year of the pandemic were utopistic.

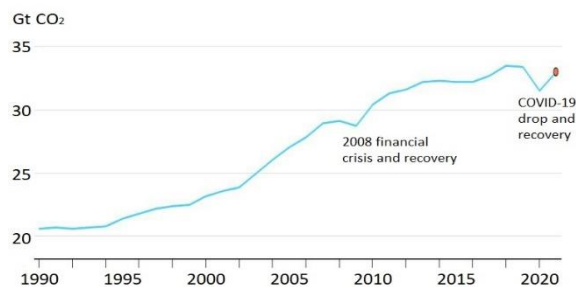


Figure 10. Global annual industrial CO₂ emissions in gigatonnes

Source: International Energy Agency (2021), edited by the author

The dramatic drop (look the Figure 10 above, the COVID-19 drop was about 3 times bigger than the 2008 financial crisis drop) of the CO₂ emissions during the first year of the pandemic was followed equally rapid recovery. According to the World Trade Organization (World Trade Organization, 2021a) the world merchandise trade volume is expected to increase by staggering 8,0% in year 2021 after the significant fall of 5,3% in year 2020, though the decline proved to be smaller than previously estimated.

As the holistic sustainability includes social, environmental and economic sustainability (Janoskova and Kral, 2019) and especially harmony between them, the shock to the global holistic sustainability caused by the COVID-19 pandemic has been very significant.

4 Conclusion

It is evident that there is a pattern in all COVID-19 consequence statistics: first from the beginning of March 2019 there was a dramatic fall in logistics volumes, global economy and global CO₂ emissions (see Figures 1, 4, 5 and 7) followed by rapid recovery. How well the world sustainability has recovered? Let's look the case with the three aspects defined by Klaus Schwab in his article (Schwab, 2020):

- 1) Steering the market towards fairer outcomes, bearing in mind environmental and social risks and opportunities and not just focusing on short term financial

profits. These aspects were also defined by editor of Financial Times Lionel Barber on September 18th 2019 in the article “Capitalism: Time for a Reset”

- 2) Ensuring that investments pursue shared goals, such as equality and sustainability. Both United States and European Union have allocated astronomical sums of money for COVID-19 pandemic recovery.
- 3) To harness the innovations of the Fourth Industrial Revolution to support the public good, especially by addressing current health and social challenges.

So, how the COVID-19 pandemic recovery process is meeting these aspects?

Aspect 1: The result so far has been that the striving for the global equity has experienced most disadvantageous condition because of the COVID-19. Both the initial shock and later recovery process has only widened the gap between the “rich” and “poor”.

Aspect 2: So far the investments have been stalled or delayed because of political debate and disagreements, yet mentioned aims for equality and sustainability improvements are still valid, especially in the European Union.

Aspect 3: This is without a doubt the biggest challenge, especially in the developing countries. So far the inequity gap between the “rich” and “poor” countries, regions and people has only been widening. Can this gap be narrowed by the Fourth Industrial Revolution innovations, or are these innovations benefitting (Durana et al., 2020; Durana et al., 2019, Dima et al., 2020) only the advanced countries, whose have better possibilities to finance these innovations and whose infrastructure is developed enough to support these innovations? Of course the US and the EU are focusing their economical stimulus to their own innovations, but the really important question is, would the “rich” countries have solidarity to help the “poor” countries to participate the Fourth Industrial Revolution innovations development and benefits in order to achieve fully global, mutual and equal improvement on the global equality – without it the holistic global sustainability cannot be achieved.

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