

World economy after the COVID-19 pandemic: Opportunities and challenges

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The world COVID-19 pandemic highlighted shortages of our civilization and indicated both challenges and opportunities for further development. The lessons of the pandemic are as follows: (i) the pandemic is characterized by global regularities of coextensive development in time and space; its impact on our civilization has a cumulative character, which has practically the same effect in all countries; (ii) the pandemic has demonstrated that this challenge may be combated only in a worldwide scale, when efforts of all countries and international organizations are synergistically united to achieve a goal of global importance; (iii) that is why globalization has no alternative; any reverse in it will brake social and economic recovery for decades; (iv) COVID-19 has made it obvious that more investment should be made in healthcare systems worldwide; (v) the pandemic promoted development of modern IT technologies and digitization of the economy, diplomacy, education, culture and markets. Fast economic recovery needs a political and economic and a social contract involving all states worldwide but mainly between the EU and the USA. The first steps for restoring mutual understanding within G7 have recently been accomplished. The most important sign of restored mutual understanding was G7's decision to deliver 1000 million COVID vaccine doses to poor and low-income countries. This decision displayed an initial readiness of G7 to assume responsibility for sustainable development of world civilization. The basic strategy for economic recovery, which is now implemented, includes fast development of capital and commodity markets promoted by an adequate fiscal policy. However, our investigations have shown that the financial instruments proposed in this strategy have tactical rather than strategic importance. Their application may achieve a quick global economic recovery but further increase of intangible vehicles in the value chain could become dangerous. The strategy must therefore be updated and include other economic instruments and technologies to ensure development of green energy and world infrastructure as well as appropriately adjusting services and diminishing the social and economic inequality in the world.

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1. Introduction

Hundreds if not thousands of articles, reports, proceedings and monographs have and continue to be published on the SARS-CoV-2 virus and its consequence, the world COVID-19 pandemic. Though methodologically, philosophically, ideologically, technically etc. these publications sometimes dramatically differ from each other, everyone agrees that the pandemic is the most severe world-scale challenge since the Second World War. In early spring 2020 the routine life of the world population drastically and rigidly changed. We suffered from a prominent lack of hygienic products, empty supermarkets, lockdowns and even curfews and, in consequence, inevitably increased unemployment worldwide. Expectations for personal careers, business strategies and travel plans perished. Already by late April 2020 the pandemic had spread to 219 countries and two huge cruise ships, MS Zaandam and Diamond Princess. It should be noted that the real distribution of the disease was and still is vaster than statistically registered: in a number of countries statistics concerning COVID-19 is classified by the State as secret; for instance, in Turkmenistan the word “coronavirus” is banned and people may be arrested for wearing masks or mentioning the word “pandemic”;¹ but in the UK a death is registered as “caused by COVID-19” if the deceased person had tested positive for the virus, irrespective of any comorbidities.

Within one month after the pandemic was officially announced (by the World Health Organization, WHO), the world economy froze, industries were closed down, corporate and personal incomes (and, hence, tax revenues) fell down to a critical level, employment collapsed, investor activities were distorted and so on. The first months of the pandemic demonstrated that it was impossible to save the world economy without government intervention, evoking the Great Depression.² COVID-19 provoked irreversible changes, and not only in the social and economic order of the world but also in our souls and spirits; we became different; we shall never be the same as only few days before.

Already in early spring 2020 the first publications appeared discussing possible post-pandemic global political, social and economic frameworks. In the rest of 2020 and in 2021 the number of such publications exponentially increased, and the trend continues in 2022. They highlight quite diverse approaches, which led to absolutely different, even contradictory conclusions and recommendations. Many of these publications are based on a variety of ideological and philosophical approaches rather than on thorough numerical analysis of the real social and economic environment created by the pandemic. That is why, before dealing with the problem of how the world economy will develop when the pandemic is over, consequences and lessons of the COVID-19 coronavirus pandemic, which is still ongoing, should be analysed quantitatively.

2. Consequences and lessons of the COVID-19 pandemic

Already in March 2020 initial analyses of the impact of COVID-19 on the global economy appeared. Subsequently the flow of publications increased exponentially, but there are distinct methodological and ideological differences between the early and successive studies.

¹ Kakissis, J. Turkmenistan has banned use of the word “coronavirus”. *Coronavirus Updates* (31 March 2020): <https://www.npr.org/sections/coronavirus-live-updates/2020/03/31/824611607/turkmenistan-has-banned-use-of-the-word-coronavirus> (accessed 15 January 2021).

² Jordà, Ò., Singh, S.R. and Taylor, A.M. Longer-run economic consequences of pandemics (Working Paper 2020-09). San Francisco: Federal Reserve Bank of San Francisco (2020).

Incontestably, the pandemic almost immediately had a huge negative impact on the world economy. *Primo*, already in February 2020 the pandemic caused dramatic failures of portfolio and other investments around the world.³ *Secundo*, the pandemic almost instantly resulted in a sharp increase of unemployment worldwide; it is estimated that the global economy will take years to restore the 2019-level labour market.⁴ *Tertio*, COVID-19 deteriorated international economic relations, and created mycelia of national egoism challenging the very essence of globalization;⁵ the pandemic economy was even called “coronomics”,⁶ and similarly politics “pandemopolitics”.⁷ *Quarto*, the coronavirus pandemic also touched the maritime sector, including oil tanker traffic. Already in late January 2020 demand for tankers dramatically decreased, and the situation became even tighter in February and March.⁸

However, the most severe impact of the pandemic was engendering uncertainty among the population,⁹ which dramatically diminished consumption of goods and, as we shall see below, provoked a crush of capital and commodity markets. The influence of daily newspapers on the degree of uncertainty was econometrically investigated.¹⁰ In mid-2020 the London-based Centre for Economic Policy Research published an exploration of diverse geopolitical and economic aspects of the pandemic.¹¹ In addition to the opinion that the economic recession was due to the diminished demand for goods (and services),¹² some extremely important ideas have been proposed; for instance, the interesting article by McKibbin and Fernando¹³ named disruption of global supply chains, panic among consumers and firms, and an unhelpful response of financial markets to the changes, provoking plunges of global stock indices, as basic reasons for economic decline. Dramatic failures of

³ OECD. Coronavirus (COVID-19) risks major setbacks for financing for sustainable development: <http://www.oecd.org/coronavirus/policy-responses/the-impact-of-the-coronavirus-covid-19-crisis-on-development-finance-9de00b3b/> (accessed 29 July 2020).

⁴ Impact of the Covid-19 pandemic on trade and development: Transitioning to a new normal. New York: United Nations Publications (2020); Boshkoska, M. and Jankulovski, N. Coronavirus impact on global economy. *Ann. “Constantin Brâncu” Univ. Târgu Jiu, Econ. Ser.* **4** (2020) 18–24.

⁵ Kuroda, H. COVID-19 and the global economy: Impact and challenges. Keynote Speech at the 62nd Annual Meeting of the National Association for Business Economics, Tokyo (2020).

⁶ Papava, V. Features of the economic crisis under the COVID-19 pandemic and the threat of the zombieing of the economy. *Bull. Georgian Natl Acad. Sci.* **14** (2020) 128–134; Papava, V. On the reflection on coronomics in economic science and economic policy. *Globalization and Business* (2020) no 10, pp. 15–24.

⁷ Mionel, V., Negut, S. and Mionel, M. Pandemopolitics: How a public health problem become a geopolitical and geoeconomic issue. *Eurasian Geogr. Econ.* **61** (2020) 389–403.

⁸ Verschuur, J., Koks, E.E. and Hall, J.W. Global economic impacts of COVID-19 lockdown measures stand out in high-frequency shipping data. *PLoS ONE* **16** (2021) e0248818.

⁹ Song, L. and Zhou, Y. The COVID-19 pandemic and its impact on the global economy: What does It take to turn crisis into opportunity? *China World Econ.* **28** (2020) 1–25; Támara, A. and Fernández Díez, M.C. Initial conditions for economic recovery after COVID-19 (Technical Note IDB-TN-1981) Washington, DC: Inter-American Development Bank (2020).

¹⁰ Bouri, E., Demirer, R., Gupta, R. and Pierdzioch, C. Infectious diseases, market uncertainty and oil market volatility. *Energies* **13** (2020) 4090.

¹¹ Baldwin, R. and di Mauro, B.W. (eds). *Economics in the Time of COVID-19*. London: CEPR Press (2020).

¹² di Mauro, B.W. Macroeconomics of the flu. In: R. Baldwin and B.W. di Mauro (eds), *Economics in the Time of COVID-19*, pp. 31–35. London: CEPR Press (2020).

¹³ McKibbin, W. and Fernando, R. The economic impact of COVID-19. In: R. Baldwin and B.W. di Mauro (eds), *Economics in the Time of COVID-19*, pp. 45–51. London: CEPR Press (2020).

derivatives markets,¹⁴ vulnerabilities in banking systems, and sharp falls of commodity prices¹⁵, especially of oil prices,¹⁶ were also suggested as representing the worst economic consequences of COVID-19.

Indeed, the influence of oil prices on the world economy is gigantic,¹⁷ and this phenomenon has deep reasons. *Firstly*, oil was the first commodity to undergo financialization (at the end of the last century): it adopted a market-related pricing system and acquired the characteristics of financial assets such as stocks and bonds.¹⁸ That is why before the 1980s spot oil prices determined derivatives pricing but by the end of the century the situation was reversed, with derivatives contracts becoming the main driver of oil markets.¹⁹ *Secondly*, for many decades oil has been the most-consumed commodity in the world. According to our calculations, in 2019 (the last year before the COVID-19 pandemic), the value of nominal world oil consumption equalled 1.50698 TUSD,²⁰ exceeding consumption of natural gas (in second place) and of coal (in third place) by 54.58 and 58.23%, respectively (world nominal consumption was calculated as world consumption volume, as published by BP,²¹ multiplied by average annual commodity price, as released by the IMF²²). *Thirdly*, as proposed in many publications and generalized and statistically confirmed by myself,²³ there is synergy of commodity pricing. Consequently, within the equilibrium conditions of commodity markets, oil provides a benchmark price for other commodities. That is why either a natural or an artificial decrease of oil prices like implementation of the “oil weapon” or the “new political economy of oil”²⁴ leads to immediate equilibrium breakage in commodity markets and to economic recession.²⁵

¹⁴ Farlow, A. An overview of the economic impact. In: Baker McKenzie (ed.), *COVID-19: Supply Chain Resilience Holds Key to Recovery*, pp. 5–7. London: Oxford Economics (2020).

¹⁵ How COVID-19 is changing the world: a statistical perspective Vol. 1. New York: United Nations, Statistics Division, Committee for the Coordination of Statistical Activities (2020); Beck, T. (2020). Finance in the times of coronavirus. In: R. Baldwin and B.W. di Mauro (eds.) *Economics in the Time of COVID-19*, pp. 73–76. London: CEPR Press (2020); Cecchetti, S.G. and Schoenholtz, K.L. Contagion: Bank runs and COVID-19. In: R. Baldwin and B.W. di Mauro (eds) *Economics in the Time of COVID-19*, pp. 77–80. London: CEPR Press (2020); etc.

¹⁶ Wheeler, C.M., Baffes, J., Kabundi, A., Kindberg-Hanlon, G., Nagle, P.S. and Ohnsorge, F.L. Adding fuel to the fire: Cheap oil during the COVID-19 pandemic (Policy Research Working Paper 9320). Washington, DC: World Bank Group (2020).

¹⁷ Nyga-Lukaszewska, H. and Aruga, K. Energy prices and COVID-immunity: The case of crude oil and natural gas prices in the US and Japan. *Energies* **13** (2020) 6300; etc.

¹⁸ Fattouh, B. *An Anatomy of the Crude Oil Pricing System*. Oxford: Oxford Institute for Energy Studies (2011).

¹⁹ Huntington, H., Al-Fattah, S.M., Huang, Z., Gucwa, M. and Nouri, A. Oil markets and price movements: A survey of models (USAAE Working Paper no 13-129). Houston: United States Association for Energy Economics (2013).

²⁰ Tera US dollars; i.e. 1000 (US) billion US dollars (10^{12} \$).

²¹ *Statistical Review of World Energy*, 69th edn. London: BP (2020).

²² IMF primary commodity prices: <https://www.imf.org/en/Research/commodity-prices> (accessed 5 January 2021).

²³ Tvalchrelidze, A.G. *Economics of Commodities and Commodity Markets*. New York: Nova Science (2011).

²⁴ Morse, E.L. New political economy of oil. *J. Intl Affairs* **53** (1999) 1–29.

²⁵ Tvalchrelidze, A.G. (2011). Ibid.

The great impact of the COVID-19 pandemic on oil markets has been asserted in several articles.²⁶ However, none of them thoroughly explored the interrelation between the pandemic and the oil market indices. That is why in three consecutive publications, two of which were co-authored with Avtandil Silagadze,²⁷ I have statistically investigated this interdependence and have shown that the pandemic is sharply divided into two periods.

Within the first period, from 21 January to 20 April 2020, the coronavirus disease started to spread worldwide unexpectedly and suddenly, and the world was not ready to meet the pandemic challenges; the population in the majority of developed countries was panic-stricken. The COVID-19 mortality rate was gradually increasing and reached 9.83% of those infected (weekly data) on 20 April. There was practically no experience in treating the disease, and the sole response to the pandemic was a total lockdown in the majority of developed countries. Severe and sudden lockdown caused cancellation of international flights, closure of schools and places of tertiary education like universities (some teaching was carried out online), banning of civil transport, curfew in many European states, closure of restaurants, bars, discothèques, beauty salons, retail shops (except those purveying food and pharmaceutical products, and in some cases ironmongery), prohibition of spectator sports events etc. During the interval of lockdown a significant and strong negative correlation existed between weekly world COVID-19 coronavirus infections and average weighted crude oil prices. Such a correlation was determined by negative expectations of investors and speculators in commodity markets. From January to April 2020 the number of oil futures contracts at the New York Mercantile and Intercontinental exchanges diminished by more than by 400% (Fig. 1);²⁸ in February 2020 33.58% fewer futures oil contracts were concluded than in January, in March 44.44% fewer contracts than in February, and in April 32.67% fewer contracts than in March. The climax occurred on 20 April, when a negative West Texas Intermediate oil price was fixed at NYMEX. The reasons for these extraordinary circumstances were excellently explained by the US Commodity Futures Trading Commission²⁹ and analysed in detail by myself.³⁰

After 20 April the situation changed significantly: the world had adapted to pandemic conditions. Hundreds of millions of SARS-CoV-2 test kits produced in dozens of countries became available worldwide. Medical institutions including emergency facilities significantly improved, the mortality rate started to diminish gradually and sustainably, curfews were lifted and businesses reopened step-by-step. It is true that in many countries secondary and even tertiary

²⁶ Aloui, C., Goutte, S., Guesmi, K. and Hchaichi, R. COVID 19's impact on crude oil and natural gas S&P GS Indexes. Halsh's archives ouvertes (2020) halshs-02613280; Sharif, A., Aloui, C. and Yarovaya, L. COVID-19 pandemic, oil prices, stock market, geopolitical risk and policy uncertainty nexus in the US economy: Fresh evidence from the wavelet-based approach. *Intl Rev. Financial Analysis* **70** (2020) 101496; etc.

²⁷ Tvalchrelidze, A. and Silagadze, A. COVID-19 coronavirus pandemic influence on crude oil prices: A preliminary statistical analysis. *Econ. Business* **12** (2020) 82–88; Tvalchrelidze, A. and Silagadze, A. Influence of COVID-19 coronavirus pandemic on international oil markets. *Sci. J. Maritime Univ. Szczecin* **63** (2020) 97–103; Tvalchrelidze, A.G. *The Impact of the COVID-19 Pandemic on International Oil Markets*. New York: Nova Science (2021).

²⁸ Tvalchrelidze, A.G. (2021). *Ibid.*, Fig. 27.

²⁹ Trading in NYMEX WTI crude oil futures contract leading up to, on, and around April 20, 2020 (Interim Staff Report). Washington, DC: CFTC (2020).

³⁰ Tvalchrelidze, A.G. (2021). *Ibid.*

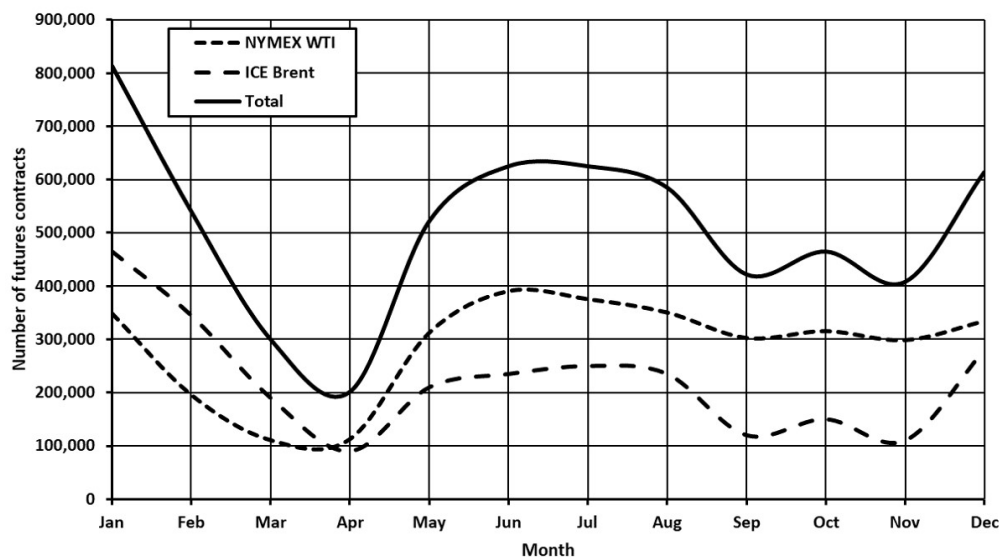


Figure 1. Monthly numbers of futures oil contracts at NYMEX and ICE in 2020.

prohibitions were imposed, but they were unable to significantly degrade the social environment. By autumn it seemed that several efficacious vaccines had been created and in December 2020 vaccination commenced worldwide.

Within this second period of the pandemic, e.g., from 20 April 2020 till today, oil prices were indirectly driven by the coronavirus mortality rate rather than by the absolute number of infections. In other words, the decisive factor for oil prices in the medium term was pandemic development tendencies instead of the actual epidemiological situation. This assertion was verified by a statistical regression model of the interdependence between oil prices and the COVID-19 coronavirus world mortality rate. At the same time, the number of oil futures contracts started to increase (see Fig. 1).

Fig. 2 shows average weighted weekly world crude oil prices in 2020.³¹ It may be seen that immediately after 20 April oil prices began to recover and in mid-July oil markets regained equilibrium, as I already had predicted in mid-May 2020 and then verified by statistical investigations.²⁶ The fact that oil markets were driven by increasing oil prices within the framework of the pandemic's second period is substantiated by the significant positive correlation between these prices and number of futures contracts, usually absent in commodity markets (Fig. 3).³²

One additional measure also promoted fast recovery of the oil markets. Regardless of the strong opposition of Russia, on 12 April 2020 OPEC+ signed a deal to cut oil production, thanks to lobbying by Saudi Arabia, with the following conditions:³³ (a) 1 May–30 June 2020,

³¹ Tvalchrelidze, A.G. (2021). Ibid., Fig. 21.

³² Tvalchrelidze, A.G. (2021). Ibid.

³³ Yermakov, V. and Henderson, J. *The New Deal for Oil Markets: Implications for Russia's Short-Term Tactics and Long-Term Strategy*. Oxford: University Press (2020).

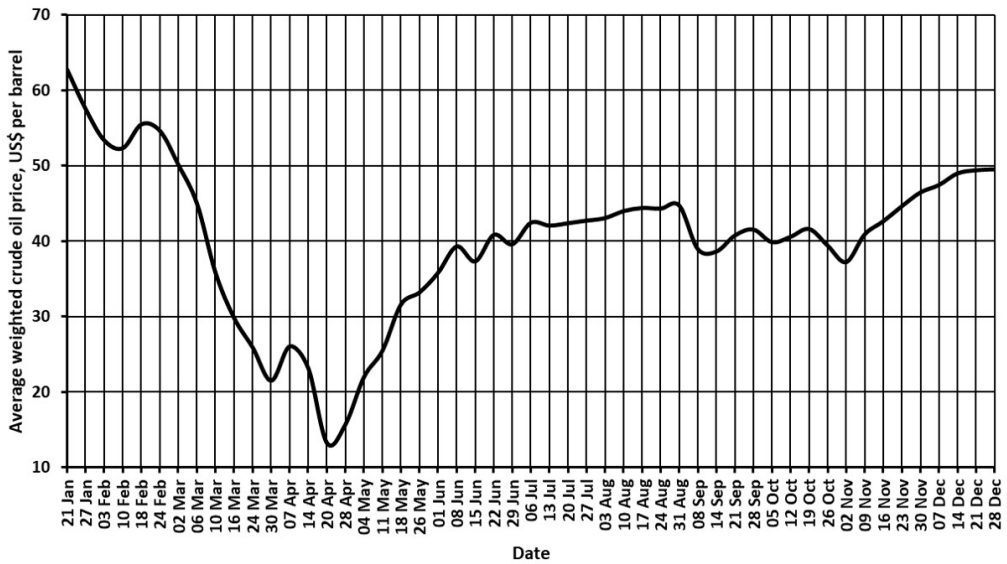


Figure 2. Average weighted weekly crude oil prices within the framework of the COVID-19 coronavirus pandemic in 2020.

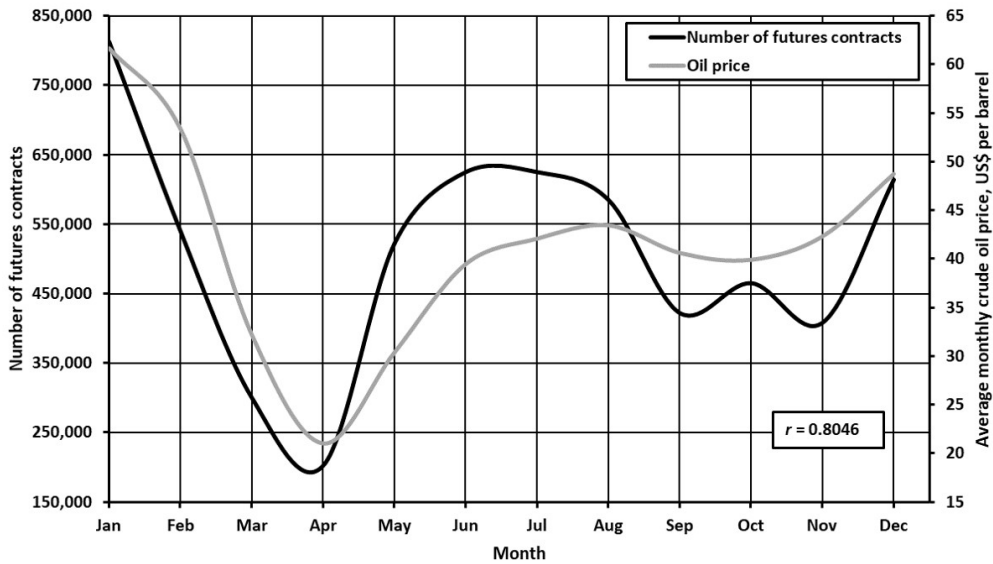


Figure 3. Interrelation between monthly numbers of oil futures contracts and oil prices in 2020. Here and below r is correlation coefficient.

joint (all OPEC+ members) oil output decreases by 9.7 million barrels per day comparing with October 2018; (b) 1 July–31 December 2020, increase of output by 2 million barrels per day, i.e. 7.7 million barrels per day less than in October 2018; (c) 1 January–30 April 2021, increase of output by 1.9 million barrels per day.

Ultimately, the recovery of oil markets determined the return of investors and speculators to commodity exchanges and ETF funds. Surprisingly, due to these circumstances, in 2020 46.19 (US) billion derivatives contracts were signed, i.e. 40.44% more than in 2019 (Fig. 4), according to World Federation of Exchanges data.³⁴ Note that world population in 2020 was 7,794,798,739 persons,³⁵ 5.92 derivatives contracts *per capita* were signed worldwide in 2020.

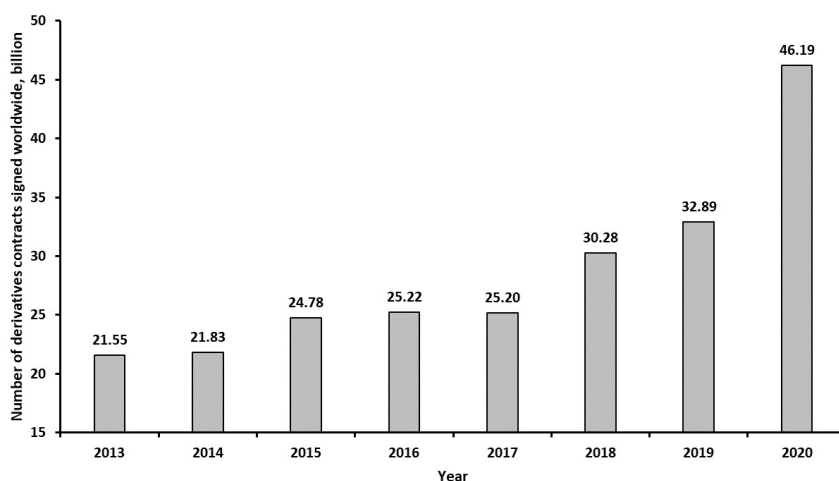


Figure 4. Derivatives contracts signed in 2013–2020 worldwide. See Fig. 6 for the types of derivatives contracts signed in 2020.

In addition, special strategies and stimulus packages were elaborated by the USA,³⁶ the UK,³⁷ the EU,³⁸ other OECD countries³⁹ and many others including small states like Georgia.⁴⁰ These programmes were characterized by a synergetic approach, had a multidimensional character and included subsidies, liberalization of tax policy, cheap business loans etc. The total volume of these stimulus packages has been assessed as 10 TUSD.⁴¹ World financial institutions supervised fair distribution of this stimulus in order to ensure its accessibility by low-income countries.⁴² Implementation of these programmes, together with revitalization of

³⁴ WFE derivatives report 2020. London: World Federation of Exchanges (2021).

³⁵ Worldometer: <https://www.worldometers.info/world-population/> (accessed 12 June 2021).

³⁶ National strategy for the COVID-19 response and pandemic preparedness. Washington, DC: White House (2021).

³⁷ Our plan to rebuild: The UK Government's COVID-19 recovery strategy. London: Her Majesty's Stationery Office (2020).

³⁸ Communication from the Commission to the Council. One year since the outbreak of COVID-19: fiscal policy response. Brussels: European Commission (2021).

³⁹ COVID-19 Government Financing Support Programmes for Businesses: 2021 Update. Paris: OECD (2021).

⁴⁰ Measures implemented by the Government of Georgia against COVID-19. Tbilisi: Government of Georgia (2020).

⁴¹ Cassim, Z., Handjiski, B., Schubert, J. and Zouaoui, Y. The \$10 trillion rescue: How governments can deliver impact. New York: McKinsey (2020).

⁴² Steel, I. and Harris, T. *Covid-19 Economic Recovery: Fiscal Stimulus Choices for Lower-Income Countries*. London: ODI (2020).

investors' activities in commodity and capital markets, saved the global economy from catastrophe, and the negative impact of the COVID-19 coronavirus pandemic was much less obtrusive than had been predicted.⁴³

Fig. 5 illustrates world GDP in the new millennium, using data from the World Bank Group⁴⁴ and the *Statistics Times*.⁴⁵ Reasons for the 2009 and 2015 recessions were analysed in detail previously.⁴⁶ The enormous arrears created by the COVID stimulus packages will pose an economic challenge in the coming years, instigating accelerated inflation⁴⁷ and increasing government debt to a critical level of about 98% of GDP.⁴⁸ Hence a 'special purpose vehicle' (SPV) will be launched to purchase all state public debts above 60% of GDP, financed by joint-and-several bonds, to be worked off over 20 years.⁴⁹

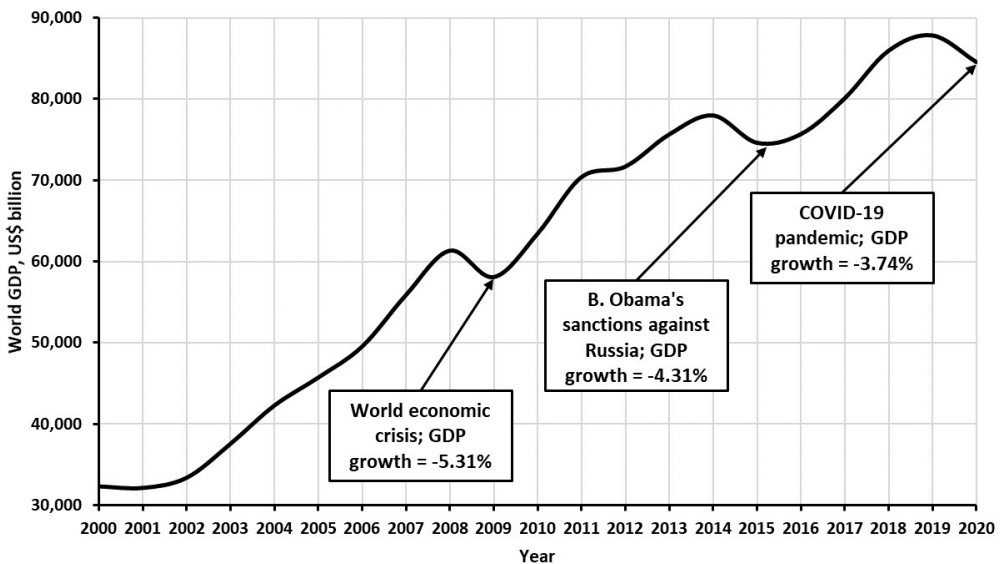


Figure 5. Dynamics of world GDP in the 21st century.

⁴³ World economic outlook update: A crisis like no other, an uncertain recovery. Washington, DC: International Monetary Fund (2020); Gujrati, R. and Uygun, G.H. Covid-19: Impact on global economics. *Amity J. Computational Sci.* 4 (2020) 24–29; Mishra, M.K. The world after COVID-19 and its impact on global economy. Kiel–Hamburg: ZBW–Leibniz Information Centre for Economics (2020); etc.

⁴⁴ World Development Indicators. The World Bank Group: <https://databank.worldbank.org/source/world-development-indicators> (accessed 15 January 2021).

⁴⁵ GDP (nominal) ranking. *Statistics Times*: <https://statisticstimes.com/economy/projected-world-gdp-ranking.php> (accessed 13 June 2021).

⁴⁶ Tvalchrelidze, A.G. (2011). Ibid.; Tvalchrelidze, A.G. (2021). Ibid.

⁴⁷ Harari, D. and Keep, M. Coronavirus: Economic impact (Briefing Paper No 8866). London: House of Commons Library (2021); Harvey, O. The case for inflation. In: J. Reid (ed.) *Life after Covid-19. Konzept*, pp. 18–20. Frankfurt am Main: Deutsche Bank Research (2021); etc.

⁴⁸ Gravelle, J.G. and Marples, D.J. Fiscal policy and recovery from the COVID-19 recession (Report R46460). Washington, DC: Congressional Research Service (2021).

⁴⁹ Reid, J. and Wall, M. How will we pay for all that stimulus? In: J. Reid (ed.) *Life after Covid-19. Konzept*, pp. 24–28. Frankfurt am Main: Deutsche Bank Research (2021).

In-depth analysis of the world COVID-19 pandemic leads to a number of essential lessons calling for active global actions in the coming years. These lessons are as follows:

1. Despite disease mismanagement in some countries, which occasions local increases of infected numbers and mortality rates, the pandemic is characterized by global regularities of coextensive development in time and space. That is why its impact on our civilization has a cumulative character, having practically the same effect in all countries despite their diversity of degree of economic development, culture, faith, ethnical identity, geographic framework, climate and other essential features. The COVID-19 pandemic has boldly demonstrated that this challenge may be combated only in a worldwide scale, when efforts of all countries and international organizations are synergistically united to achieve a goal that is of global importance;⁵⁰

2. The absolute prerequisite for a proper reset is greater collaboration and coöperation within and between countries;⁵¹

3. Globalization has no alternative, and the future world economy will need even more globalization;⁵²

4. Any reverse in globalization will brake social and economic recovery for decades;⁵³

5. COVID-19 has made it obvious that more investments should be made in healthcare systems worldwide;⁵⁴

6. Surprisingly, the coronavirus pandemic promoted development of modern IT technologies and digitization of the economy,⁵⁵ diplomacy,⁵⁶ culture⁵⁷ and markets.⁵⁸

Let us now consider these lessons in different scenarios of post-COVID global development.

3. World economy in the post-COVID era: Dreams and realities

A vast number of publications on post-COVID global development trends have appeared and are appearing; some of them report results of a serious analysis but others display, let us say, ideological dreams. These publications may be classified into a number of approaches.

⁵⁰ Tvalchrelidze, A.G. (2021). Ibid., p. 14.

⁵¹ Schwab, K. and Malleret, T. *COVID-19: The Great Reset*. Deerfield Beach, Fla: Forum Publishing (2020).

⁵² Contractor, F.J. The world economy will need even more globalization in the post-pandemic 2021 decade. *J. Intl Business Studies* 1 (February 2021) 1–16

⁵³ Winkler, R. and Saravelos, D. The case for deflation. In: J. Reid (ed.), *Life after Covid-19. Konzept*, pp. 21–23. Frankfurt am Main: Deutsche Bank Research (2021).

⁵⁴ Chickering, P. The investment needed in our healthcare systems. In: J. Reid (ed.) *Life after Covid-19. Konzept*, pp. 14–17. Frankfurt am Main: Deutsche Bank Research (2021); Vitenu-Sackey, P.A. and Barfi, R. The impact of Covid-19 pandemic on the global economy: Emphasis on poverty alleviation and economic growth. *Econ. Finance Lett.* 8 (2021) 32–43.

⁵⁵ Digital transformation in the age of COVID-19: Building resilience and bridging divides. Digital Economy Outlook 2020 Supplement. Paris: OECD (2020); Acemoğlu, D. Remaking the post-Covid world. *Finance Development* (March 2021) 5–9.

⁵⁶ Riordan, S. Covid-19 and the digitalisation of diplomacy. In: *The World Before and After Covid-19: Intellectual Reflections on Politics, Diplomacy and International Relations* (ed. G.L. Gardini), pp. 40–43. Salamanca & Stockholm: European Institute of International Studies Press (2020).

⁵⁷ Lhermitte, M., Alvarez, H., Nam, Q., Marcout, C. and Sause, E. *Rebuilding Europe—The cultural and creative economy before and after the COVID-19 crisis*. Paris: EYGM (2021).

⁵⁸ Bouchon, S. and Toumi, M. *Post-COVID Market Trends*. Luxembourg: Luxinnovation Thruster Partners for Business (2020).

The United Nations, in several consecutive publications,⁵⁹ has provided a research roadmap for socio-economic recovery from COVID-19, constituting a framework for leveraging the power of science in support of a better recovery and a more equitable, resilient and sustainable future. The roadmap is built on five pillars: (1) health systems and services; (2) social protection and basic services; (3) economic response and recovery programmes; (4) macroeconomic policies and multilateral collaboration; and (5) social cohesion and community resilience. This approach, however, gives only a possible indication for synergetic development and does not constitute a real, practical, recovery programme.

The ASEAN strategy consists of five principles:⁶⁰ (1) enhancing health systems; (2) strengthening human security; (3) maximizing the potential of the intra-ASEAN market and broader economic integration; (4) accelerating inclusive digital transformation; and (5) advancing towards a more sustainable and resilient future.

The Japanese approach comprises eight bullet points:⁶¹ (1) recovery must begin during the ongoing response; (2) inclusive, people-centred recovery to leave no one behind; (3) transparent evidence-based decision-making; (4) build back better and greener; (5) preserve development gains; (6) greater regional and global solidarity; (7) institutionalize effective coping mechanisms; and (8) effective risk communication.

Surprisingly, leading Russian economists⁶² believe that nothing will change in the post-COVID world, hence Russia, *grosso modo*, must pursue its actual policy and politics; i.e., duly follow President Putin's social and economic doctrine analysed in detail recently.⁶³

The Chinese approach assumes that the COVID-19 pandemic heightened uncertainties in the global economy. Thus, it considers that recovery will be based on creation of new economic influence centres, meaning (between the lines!) an increase of China's importance in global economic development.⁶⁴ The possible increase of China's and Russia's geopolitical influence on the post-COVID commodity and capital markets is discussed by Josef Braml.⁶⁵ A "tech cold war" and a "tech wall" between the USA and China in the coming years may cut the world into two halves with little or no interoperability.⁶⁶ However, I believe that such a scenario is less probable due to certain economic realities (discussed below).

⁵⁹ UN research roadmap for COVID-19 recovery, New York: United Nations (2020); Impact of the COVID-19 pandemic on trade and development. Transitioning to a new normal. Geneva: United Nations (2020); Economic and social survey of Asia and the Pacific 2021: Towards post-COVID-19 resilient economies. Bangkok: United Nations Economic and Social Commission for Asia and the Pacific (2021); etc.

⁶⁰ ASEAN comprehensive recovery framework. Adopted at the 37th ASEAN Summit. Jakarta: ASEAN (2020).

⁶¹ *Practical Lessons for Recovery from the COVID-19 Pandemic: Principles for recovery*. Chuo-ku, Kobe: International Recovery Platform (2020).

⁶² Aganbegyan, A.G., Klepach, A.N., Porfiryev, B.N., Uzyakov, M.N. and Shirov, A.A. Post-pandemic recovery: The Russian economy and the transition to sustainable social and economic development. *Studies Russian Econ. Development* **31** (2020) 599–605.

⁶³ Tvalchrelidze, A.G. (2021). Ibid.

⁶⁴ Song, L. and Zhou, Y. The COVID-19 pandemic and Its impact on the global economy: What does it take to turn crisis into opportunity? *China World Econ.* **28** (2020) 1–25.

⁶⁵ Braml, J. *The European Union in the Corona World Economic Crisis: Perspectives and options in the geo-economic competition between the US and China*. Munich: Hanns-Seidel-Stiftung (2020).

⁶⁶ Walia, A. The coming tech wall and the Covid dilemma. In: J. Reid (ed.) *Life after Covid-19. Konzept*, pp. 30–34. Frankfurt am Main: Deutsche Bank Research (2021).

According to the Policy Department of the European Parliament,⁶⁷ the pandemic has changed geopolitical realities, and therefore European foreign policy should be updated—meaning that bilateral relations with the USA, Russia and China ought to change. The EU will try to pursue more interventionist approaches and be the driver of collective change in international relations and economics.⁶⁸ Indeed, according to Claudia Schmucker,⁶⁹ the pandemic significantly deteriorated EU–USA relations, because President Trump threatened the fundamental basis for multilateral coöperation, whereas the EU defended it. Just this contradiction allowed Nicole Koenig and Anna Stahl to propose that, given such a background, the role of the European Union as a leader of the globalized world may be ensured.⁷⁰ However, today under Joe Biden’s presidency this contradiction is over and, as we will see below, the EU has no corresponding economic instruments and vehicles to safeguard such a leadership.

A number of publications asserted that the COVID-19 pandemic was a good opportunity for close international collaboration aiming at promoting “green” energy and sustainable development.⁷¹ In addition, it provides a framework for mitigation of four existential risks that we collectively face: (1) nuclear threats; (2) climate change; (3) the unsustainable use of essential resources like forests, seafood, topsoil and fresh water; and (4) the consequences of the enormous differences in standards of living between the world’s people.⁵³ For other authors the time has come for developing a circular economy.⁷²

Businesspeople, representatives of industrial circles and economic analysts consider the possibility not only to restore but also to strengthen the value chain through increased diversification.⁷³ Private as well as infrastructural investments with a background of

⁶⁷ The geopolitical implications of the COVID-19 pandemic. Strasbourg: The European Parliament (2020).

⁶⁸ Bergsen, P., Billon-Galland, A., Kundnani, H., Ntousas, V. and Raines, T. *Europe after Coronavirus: The EU and a new political economy*. London: The Royal Institute of International Affairs & Chatham House (2020).

⁶⁹ Schmucker, C. The effects of the COVID-19 pandemic on US and European commitment to the multilateral economic order (IAI Papers 20 | 39). Rome: Istituto Affari Internazionali (2020).

⁷⁰ Koenig, N. and Stahl, A. How the coronavirus pandemic affects the EU’s geopolitical agenda. Berlin: Jaques Delors Centre, Hertie School (2020).

⁷¹ COVID-19 response measures and their potential implications for greening the economies of Eastern Europe, the Caucasus and Central Asia. Proc. annual meeting (virtual conference) of the GREEN Action Task Force, 13 October 2020 (eds K. Michalak and J. Ashikbayeva). Paris: OECD (2020).

⁷² Ibn-Mohammeda, T. Mustapha, K.B., Godsell, J., Adamu, Z., Babatunde, K.A., Akintade, D.D., Acquaye, A., Fujii, H., Ndiaye, M.M., Yamoah, F.A. and Koh, S.C.L. A critical analysis of the impacts of COVID-19 on the global economy and ecosystems and opportunities for circular economy strategies. *Resources Conservation Recycling* **164** (2021) 105169; Morlet, A., Blériot, J., Wachholz, C., Gueye, S. and Venho, C. The circular economy: a transformative Covid-19 recovery strategy: How policymakers can pave the way to a low carbon, prosperous future. Cowes, Isle of Wight: Ellen MacArthur Foundation (2020).

⁷³ Támara, A. and Fernández Díez, M.C. Initial conditions for economic recovery after COVID-19 (Technical Note No IDB-TN-1981). Washington, DC: Inter-American Development Bank (2020); de Vet, J.M., Nigohosyan, D., Ferrer, J.M., Gross, A.-K., Kuehl, S. and Flickenschild, M. Impacts of the COVID-19 pandemic on EU industries. Luxembourg: Committee on Industry, Research and Energy, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament (2021).

comprehensible fiscal policy are suggested as representing the main remedy for recovery,⁷⁴ which correctly was forecasted to commence in mid-2021.⁷⁵

The Anglo-Saxon strategic approach adopted in the USA seems to me the most appropriate programme for several reasons, discussed below. According to this strategy, the main financial vehicle for economic recovery and growth combines broad access to financial markets with diminution of the interest rate.⁷⁶ Based on this vehicle, the strategy focuses on four domains of action: health, economy, governance and defence.⁷⁷ The main goals of the health domain are to: create a *counter coronavirus coalition* of allied nations, close partners and like-minded states devoted to defeating the virus; reform and strengthen existing global health institutions (e.g., the World Health Organization); create new institutions to secure public health (e.g., an international public health monitoring agency). The basic goals of the economy domain are: work through the G7 and G20 to coördinate a global economic response; protect against economic vulnerabilities (e.g., strengthen and secure supply chains); ensure a globalized, free and fair system of trade (i.e., negotiate new trade agreements); leverage new technologies and lessons learned from the pandemic to reimagine a prosperous, post-COVID global economy that prioritizes inclusive growth. The main priorities of the governance domain may be formulated as: tout successful democratic models of pandemic response (e.g., those of Finland, Iceland, New Zealand, Singapore, South Korea and Taiwan); counter nefarious Chinese Communist Party (CCP) and Russian influence and disinformation in allied and partner nations; engage in closed-door diplomacy with countries at risk of autocratic backsliding; leverage new technologies, especially digital platforms, to modernize elections and help revitalize existing democracies. The defence domain aims to: strengthen deterrence and demonstrate US and allied readiness (e.g., by joint statements, shows of force etc.); prepare US and allied forces for the future of warfare; broaden the concept of security to include pandemic security; use the crisis and pressure on defence budgets to transform US and allied capabilities away from legacy platforms and toward emerging defence technologies central to future warfare (e.g., drone swarms, artificial intelligence, space etc.).

It is quite clear that under this strategy COVID-19 is considered as an opportunity to increase Anglo-Saxon influence in the globalized world, and this pretension has real political and economic grounds.

Setting aside numerous definitions and contradictory philosophical, ideological, political and economic, social etc. approaches,⁷⁸ in few words globalization may be formulated as the

⁷⁴ Stern, N. and Zenghelis, D. Fiscal responsibility in advanced economies through investment for economic recovery from the COVID-19 pandemic. London: Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science (2021).

⁷⁵ From endless winter to new dawn: What might a post-COVID-19 economy look like? Stamford: Deloitte Development LLC (2021).

⁷⁶ Opportunities for stronger and sustainable postpandemic growth. Coördinated by E. Cavallo and A. Powell. Washington, DC: Inter-American Development Bank (2021).

⁷⁷ Cimmino, J., Katz, R., Kroenig, M., Lipsky, J. and Pavel, B. *A Global Strategy for Shaping the Post-COVID-19 World*. Washington, DC: Atlantic Council (2020).

⁷⁸ See, for instance, Reich, S. *What is Globalization? Four possible answers*. Notre Dame, Indiana: The Hellen Kellogg Institute for International Studies (1998); J. Sheffield, A. Korotayev and L. Grinin (eds), *Globalization: Yesterday, today, and tomorrow*. Litchfield Park, Arizona: Emergent

world expansion of a neoliberal economic model.⁷⁹ According to well-known French economists,⁸⁰ the economy of the globalized world is ruled by the biggest world economy—that of the USA, which, in turn, is based on a neoliberal approach meaning minimum centralization of power and inadequate growth of the finance sphere. Within such a framework, added value originates mainly from financial instruments rather than from industrial activity, and these instruments play an important, if not decisive, role in the value chain. Moreover, these financial instruments are developing extremely fast. As may be seen in Fig. 4, the number of derivatives contracts in the world's exchanges increased 2.14 times from 2013 to 2020. It is extremely important to note that the notional value of these contracts within the same period has exponentially grown 58 times, from about 155 TUSD to 2.151 PUSD.⁸¹

In 2020 only 26.13% of contracts were signed at the USA's basic stock, mercantile, and commodity exchanges but their notional value was 69.41% of the world's grand total. Fig. 7 displays shares of the USA exchanges in the overall notional value of derivatives contracts signed in 2020 worldwide. It should also be noted that interest rate options and futures cover the predominant share of the notional value, and here the role of the USA is undisputable. Now, examining the open interest of these contracts and comparing it with the notional value, we were able to assess the minimum added value originated through the derivative contracts signed. The figure is as high as 10 TUSD; i.e., comparable with the volume of State stimulus packages.

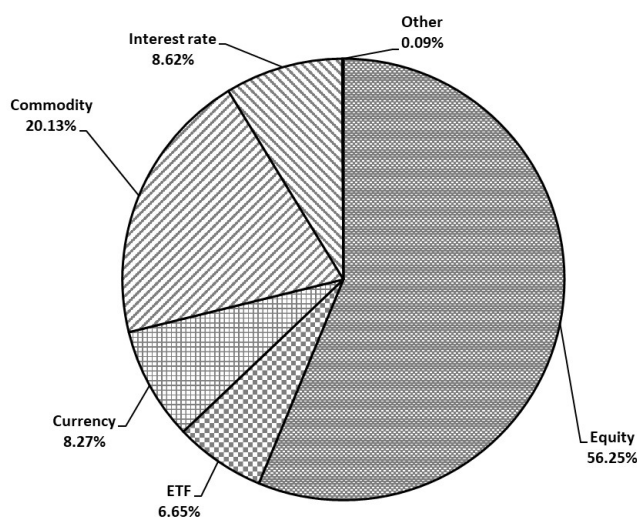


Figure 6. Types of derivative contracts signed in 2020 worldwide.

Publications (2013); Davies, E.O. and Egbuch, S.A. Understanding the concept of globalization. *Acad. J. Current Res.* 6 (2019) 10–25.

⁷⁹ Tvalchrelidze, A.G. (2011). Ibid.

⁸⁰ Carroué, L. Dossier crise des subprimes: la fin de l'hégémonie américaine? In: *Images économiques du monde. Géopolitique, géoéconomie 2009*, pp. 1–18. Paris: Éditions Arman Colin (2008); Artus, P., Bethèze, J.-P., de Boissieu, Ch. et Capelle-Blancard, G. *La crise des subprimes*. Paris: La documentation française (2008).

⁸¹ ('P' (peta) denotes a multiplier of 10^{15}). WFE/IOMA 2014 derivatives market survey. London: IOMA (2015); WFE derivatives report 2020. Ibid.

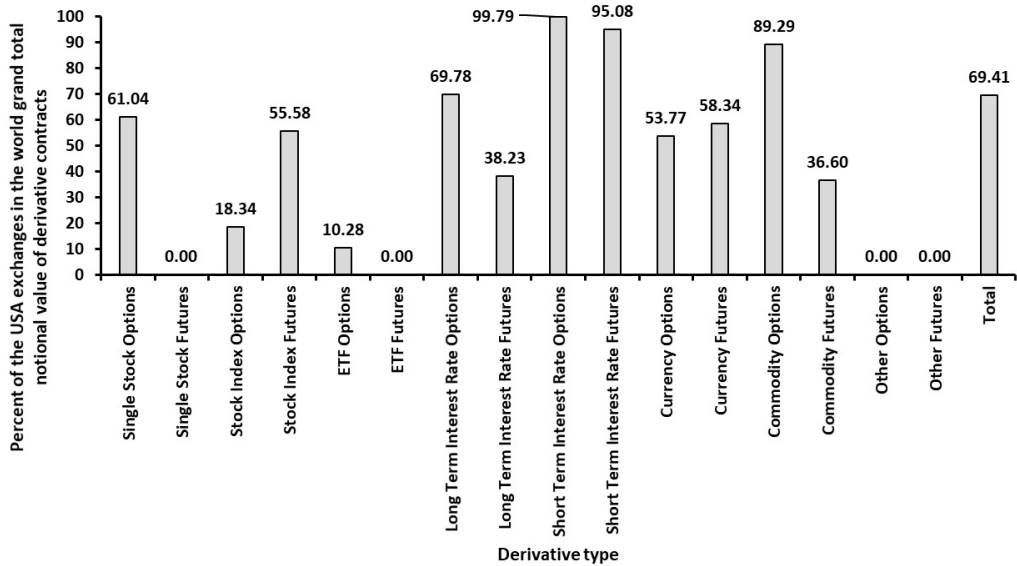


Figure 7. Notional value of the derivative contracts signed in the USA as a share of the world grand total.

One additional feature should also be mentioned. All the derivatives contracts are quoted in USD. The Chinese government obliged Chinese exchanges to trade in Chinese yuan (RMB); hence benchmark prices and open interest are quoted in USD and investors and speculators convert to this currency immediately after a transaction is made. Due to this feature, the USA administration has a tangible tool for affecting commodity and derivatives markets worldwide. Basically, artificial strengthening or weakening of the USD regulates oil prices, and I have called this instrument the new implementation of the “oil weapon”. Because, as mentioned above, oil prices determine other commodity prices and they, in turn, regulate derivatives markets, astute application of this financial instrument allows the US government to control the global economy. As I have shown earlier,⁸² in our present century this variant of the oil weapon was used by US presidents George W. Bush and Barack Obama for punishing Russia but, at the same time, the back effect of these strategies was decline of the world GDP (see Fig. 5). The necessity of economic recovery after the most unstable interval of the COVID-19 pandemic obliged the newly elected president, Joe Biden, to pursue a corresponding monetary policy. Fig. 8 displays the interrelation between the weekly WTI futures prices⁸³ and the EUR to USD exchange rate, as released by the European Central Bank.⁸⁴ Significant positive correlation is observed. Note that the critical value of Pearson’s correlation in a two-tailed model with degrees of freedom $N = 2$ and confidence level 0.005 is 0.325.⁸⁵

⁸² Tvalchrelidze, A.G. (2021). Ibid.

⁸³ Crude Oil WTI Futures—July 21: <https://www.investing.com/commodities/crude-oil-historical-data> (accessed 14 June 2021).

⁸⁴ Change from 11 June 2020 to 11 June 2021. US Dollar. European Central Bank: https://www.ecb.europa.eu/stats/policy_and_exchange_rates/euro_reference_exchange_rates/html/eurofxref-graph-usd.en.html (accessed 14 June 2021).

⁸⁵ Table of critical values: Pearson correlation: <https://www.statisticssolutions.com/free-resources/directory-of-statistical-analyses/pearsons-correlation-coefficient/table-of-critical-values-pearson-correlation/> (accessed 14 June 2021).

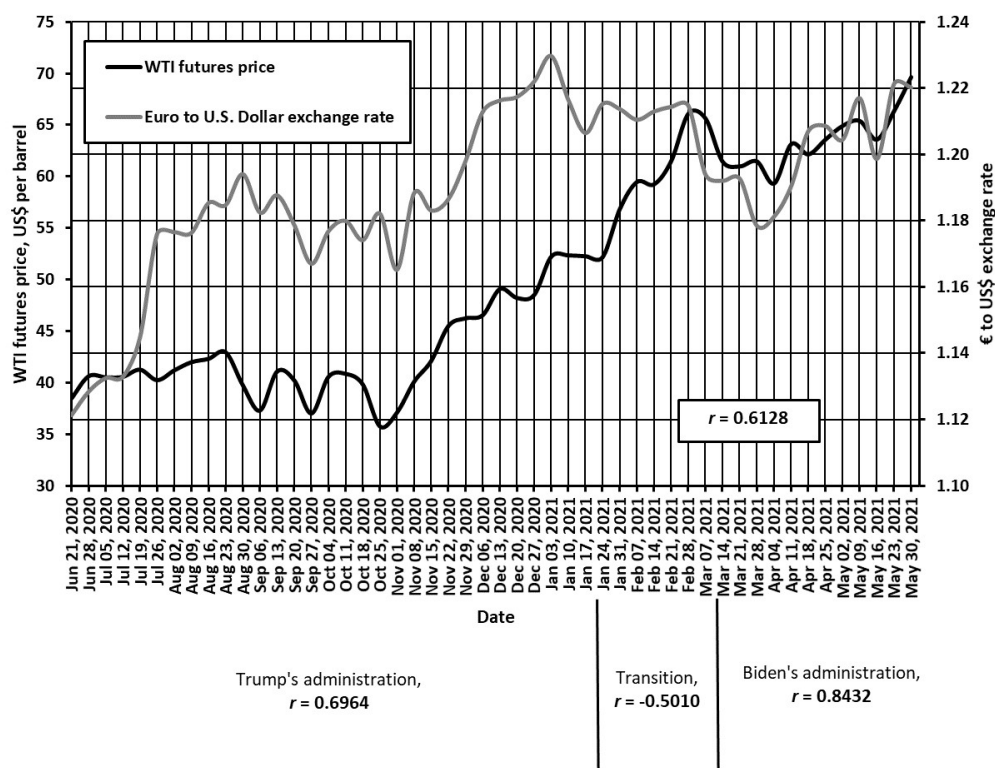


Figure 8. Interrelation between euro to US dollar exchange rate and WTI futures prices.

Such correlation analysis followed by other statistical methods is useful for geopolitical and geoeconomic investigations, for which we shall provide appropriate data in a subsequent publication. In brief outline, the presented data may be divided into time series with proper statistical regularities. It can be seen that the last days of Donald Trump's presidency were characterized by weak monetary management. Already in early March 2021 Joe Biden designed his own macroeconomic approach, whereas the transition period displayed the absence of any financial policy.

Hence, application of a weak US dollar policy is to be carried out with the accuracy of a sniper. As I have shown earlier,⁸⁶ uncontrolled increase or decrease of oil prices leads to a number of negative macroeconomic consequences of global extent. Thus, short- and long-term consequences of either weak or strong US dollar policies should be measured and appraised. For the assessment of a possible oil price impact on commodity and capital markets a special approach is to be used.

As I have established in my recent monograph,⁸⁷ the oil market may be considered as a semi-closed bivariate system, which is characterized by two degrees of freedom. Within the

⁸⁶ Tvalchrelidze, A.G. (2011). Ibid.

⁸⁷ Tvalchrelidze, A.G. (2021). Ibid.

system behaviour of its elements, i.e. of investors and speculators, it has a high degree of uncertainty; however, the system's stability is determined by two external factors: the amount of oil to be contracted at each stage; and the number of contracts signed, which correspond to this amount. The added value created by the oil market is a function of derivatives contracts signed under open interest, which, in turn, depends on the benchmark price imposed by the exchange. For analysing this system, I have elaborated a simple mathematical apparatus and have evinced that the market model represents an exponential function where the added value created within the market is limited by the exponent. Some sixty years ago, appropriate inflation-adjusted mathematical methods were elaborated for determining marginal conditions of such functions,⁸⁸ which later were several times slightly modified for the solution of specific economic problems.⁸⁹ In a forthcoming publication I will present the results of such modeling applied to the present system of interest, which show that the exponential function has almost reached the limit of the exponent and has only about 30% of reserve.

There is another possibility to statistically investigate the sustainability of such systems. It is based on regression analysis of the interdependence of GDP with different varying parameters; for instance, with the added value created by derivatives contracts. The method was elaborated,⁹⁰ slightly adjusted⁹¹ and described in detail⁹² earlier. Here I would like to present the model of interdependence of world GDP and consumption value of basic primary commodities. Table 1 contains the data bank of world basic primary commodity consumption values. The latter are calculated as consumption volume multiplied by average annual commodity price computed from monthly prices as released by the IMF.²² Fuel commodity consumption volume was taken from BP's *Statistical Review of World Energy*,²¹ for mineral commodities from the British Geological Survey yearbooks⁹³ and for agricultural commodities from the FAO pocketbooks.⁹⁴ Table 2 gives the share of each commodity in the consumption value model.

As may be seen in Fig. 9, there is a tight, strong and positive correlation between the nominal model world commodity consumption value and GDP. Hence analysing this interdependence by regression statistics is possible, according to methodology elaborated earlier and mentioned above. ANOVA calculations were carried out using the SPSS software package. Fig. 10 shows the results. The accuracy of the model GDP calculated from world commodity consumption is $\pm 5\%$ (Fig. 11); the graph of the regression equation has an inverted U-shape, implying that further

⁸⁸ Hubbert, M.K. Energy resources. In: *Resources and Man* (A study and recommendations by the National Academy of Sciences, National Research Council Committee on Resources and Man), pp. 157–242. San Francisco: W.H. Freeman (1960).

⁸⁹ See, for instance, de Verte Harris P. *Mineral Resources Appraisal: Mineral endowment, resources, and potential supply concepts, methods, and cases*. London: Clarendon Press (1984); Tvalchrelidze, A.G. *Mineral Resources and Mineral Resource Base of Georgia*. Moscow: Rudy i Metally Publishing House (2007) (in Russian).

⁹⁰ Tvalchrelidze, A.G. (2011). Ibid.

⁹¹ Tvalchrelidze, A. and Silagadze, A. Macroeconomic model for oil-exporting countries. *Central Asia Caucasus* **14** (2013) 118–144.

⁹² Tvalchrelidze, A.G. (2021). Ibid.

⁹³ See, for instance, Brown, T.J., Idoine, N.E., Wrighton, C.E., Raycraft, E.R., Hobbs, S.F., Shaw, R.A., Everett, P., Deady, E.A. and Kresse, C. *World Mineral Production 2015–2019*. Keyworth, Nottingham: The British Geological Survey (2021).

⁹⁴ World Food and Agriculture—Statistical Pocketbook (2020). Rome: FAO; etc.

Table 1. World mineral consumption value/GUSD^a 1980–2019.

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
World GDP	11,038	11,317	11,207	11,450	11,884	12,480.3	14,767.4	16,773.9	18,762	19,688
Oil	817.0	751.8	648.3	588.5	594.7	557.4	308.2	386.4	334.7	419.3
Gas	90.5	101.7	127.8	124.6	134.9	143.6	104.4	116.0	159.1	168.2
Coal	158.4	190.8	209.0	151.0	128.3	145.7	136.0	125.5	163.6	180.1
Iron ore	10.7	10.3	11.5	9.8	9.9	10.4	10.6	10.5	10.5	12.2
Al	27.3	19.1	13.4	20.1	19.8	16.1	17.9	25.8	47.3	37.3
Cu	20.5	16.6	13.5	15.1	13.7	14.1	13.9	18.3	27.7	31.5
Pb	4.9	3.9	2.8	2.5	2.5	2.2	2.3	3.4	3.8	4.1
Zn	4.6	5.1	4.4	4.7	5.9	5.3	5.3	5.6	8.8	12.2
Au	24.0	18.9	16.2	19.1	16.9	15.6	19.0	23.8	26.3	24.6
Ag	7.2	3.8	2.9	4.4	3.4	2.6	2.3	3.2	3.3	2.9
Diamond	1.3	1.4	1.6	2.3	2.6	2.8	4.0	4.2	4.5	4.6
Wheat	69.1	73.5	68.2	68.5	68.5	65.2	57.5	54.2	72.6	82.9
Corn	50.3	54.9	45.9	51.7	61.1	55.0	41.3	33.2	42.8	50.1
Rice	117.1	132.8	82.1	83.1	76.9	67.4	61.6	67.5	90.1	101.9
Soybean	17.2	18.3	16.6	16.9	18.0	15.2	18.9	20.5	28.0	25.9
Sugar	53.1	32.0	16.3	16.8	10.7	8.6	12.9	14.5	22.0	27.9
Coffee	15.9	13.7	18.6	14.8	17.0	16.2	23.0	12.1	19.3	12.7
Tea	4.2	3.9	3.9	4.8	7.6	4.5	4.4	4.0	4.4	5.5
Total	1,493.3	1,452.4	1,302.9	1,198.7	1,192.5	1,148.0	843.4	928.8	1,068.8	1,204.1

^a Billiards (US billions), i.e. thousands of millions, of US dollars.

Table 1 (continued).

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
World GDP	22,001	23,083	24,680	25,019	26,868	29,810	30,414	30,333	30,219	31,337
Oil	536.1	467.1	453.1	391.5	374.0	405.2	506.3	473.3	304.0	429.9
Gas	203.1	235.1	187.8	200.6	182.5	200.1	263.7	233.7	189.7	203.9
Coal	183.7	180.5	173.3	141.9	146.4	178.6	177.0	162.7	132.6	117.7
Iron ore	13.8	14.4	13.6	12.0	11.1	12.0	13.3	13.9	14.2	12.2
Al	31.6	25.6	24.5	22.5	28.0	35.2	31.6	33.6	29.9	31.6
Cu	29.0	24.7	24.8	21.0	26.7	35.3	28.6	29.8	22.2	22.4
Pb	4.8	3.2	3.0	2.2	3.0	3.5	4.4	3.8	3.2	3.1
Zn	10.9	8.1	9.1	7.0	7.4	7.6	7.6	10.2	8.1	9.0
Au	33.9	40.2	41.3	45.3	49.1	42.2	41.8	48.3	40.6	36.0
Ag	2.6	2.0	1.9	2.0	4.0	4.0	4.1	4.2	4.6	4.5
Diamond	4.8	4.9	5.2	5.5	5.7	6.0	6.4	6.4	6.7	6.3
Wheat	67.8	68.2	82.1	78.4	78.6	95.2	114.1	91.9	68.2	57.5
Corn	53.5	53.7	55.6	48.1	59.9	63.5	97.1	67.4	61.5	54.8
Rice	95.0	102.5	94.2	83.7	98.4	119.3	128.5	117.1	120.3	126.7
Soybean	22.3	22.5	24.5	26.9	31.2	28.0	36.6	44.3	35.7	28.0
Sugar	27.6	20.4	21.6	24.1	31.2	36.0	32.7	31.4	25.8	18.9
Coffee	11.1	10.5	8.2	8.5	18.4	17.2	16.4	24.4	18.9	17.5
Tea	5.5	4.8	4.9	4.7	4.8	4.1	4.5	6.3	7.2	6.4
Total	1,337.2	1,288.4	1,228.7	1,125.7	1,160.3	1,293.0	1,514.8	1,402.8	1,093.5	1,186.3

Table 1 (continued).

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
World GDP	32,347	32,158	33,408	37,589	42,293	45,727	49,542	55,876	61,335	58,080
Oil	719.4	609.6	609.6	757.3	1,069.7	1,440.3	1,699.9	1,900.7	2,696.9	1,548.6
Gas	371.6	362.6	312.5	428.3	495.4	715.0	776.3	828.6	1,212.4	712.1
Coal	123.3	154.7	134.2	150.4	323.2	309.5	349.3	492.3	971.6	549.9
Iron ore	13.4	13.6	13.9	16.8	22.3	43.3	60.2	73.3	134.6	182.6
Al	37.2	34.3	34.3	39.6	51.4	77.0	108.4	124.5	127.7	77.7
Cu	27.4	23.6	23.6	27.8	47.9	60.9	113.9	128.6	124.6	92.4
Pb	2.9	3.2	3.1	3.6	6.2	7.3	10.6	21.7	19.2	15.9
Zn	9.9	8.1	7.5	8.1	11.2	15.2	35.9	36.5	37.0	18.1
Au	34.5	33.7	37.1	39.9	47.6	45.2	60.9	69.5	107.0	115.7
Ag	4.5	3.8	3.9	3.9	6.1	6.9	10.8	12.7	16.1	12.6
Diamond	6.5	7.0	7.9	9.5	10.3	11.6	12.1	12.1	12.7	8.3
Wheat	58.9	62.6	78.2	72.4	84.7	81.4	103.6	137.7	195.4	130.1
Corn	51.7	53.4	59.8	65.3	74.6	68.5	85.6	127.3	191.3	136.2
Rice	117.8	99.5	105.2	106.7	130.8	156.2	166.4	187.7	411.5	354.7
Soybean	32.0	31.2	37.2	43.4	59.8	49.1	51.1	75.2	100.2	98.4
Sugar	23.2	24.5	19.3	22.1	24.3	32.4	48.3	32.9	41.5	61.2
Coffee	12.8	8.9	9.8	8.9	12.3	16.8	19.4	19.5	23.7	23.1
Tea	7.4	6.1	5.7	6.3	6.7	7.7	8.9	8.2	10.5	12.7
Total	1,654.6	1,540.4	1,502.7	1,810.3	2,484.5	3,144.2	3,721.4	4,289.1	6,433.9	4,150.2

Table 1 (continued).

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
World GDP	63,412	70,371	71,666	75,622	77,961	74,602	75,653	80,051	85,910	87,798
Oil	2,127.6	2,626.7	2,641.4	2,819.8	2,776.8	1,612.7	1,153.8	1,485.1	1,905.2	1,507.0
Gas	831.5	1,163.3	1,302.3	1,294.5	1,287.9	861.6	479.2	652.0	870.8	684.5
Coal	793.9	1,014.3	822.0	728.0	599.6	477.9	534.8	720.3	873.8	629.4
Iron ore	386.6	505.9	383.0	430.7	330.1	185.7	194.3	237.0	205.0	284.6
Al	126.9	154.2	137.7	133.3	144.2	111.0	130.1	169.1	188.5	148.6
Cu	144.2	173.8	162.3	155.6	156.9	127.2	114.9	146.6	155.1	145.7
Pb	21.1	25.3	21.8	24.0	22.8	19.1	20.7	26.8	26.6	23.0
Zn	27.3	27.9	24.2	25.1	29.6	26.4	28.6	39.6	40.0	33.4
Au	167.0	237.2	246.3	184.3	162.8	159.5	171.1	167.1	172.8	192.8
Ag	20.9	37.5	29.7	25.7	20.4	18.3	17.6	17.0	16.2	16.7
Diamond	11.4	14.1	12.6	14.1	14.5	13.9	12.3	14.1	14.5	13.6
Wheat	124.5	195.3	185.7	188.9	177.9	136.8	107.3	112.1	137.0	124.7
Corn	166.9	277.1	286.5	256.5	195.4	172.1	154.3	156.3	171.4	189.5
Rice	324.7	360.4	391.8	361.7	303.9	270.2	276.4	288.8	289.4	295.8
Soybean	101.6	115.7	144.4	146.1	146.4	108.7	123.0	118.7	112.9	130.6
Sugar	75.3	99.7	83.7	68.5	66.1	50.6	69.6	65.3	51.1	47.4
Coffee	34.5	50.8	36.0	27.3	42.9	33.5	33.7	32.7	31.1	39.1
Tea	13.8	16.0	16.7	13.5	12.4	18.1	16.6	22.3	24.0	25.8
Total	5,499.8	7,095.2	6,928.1	6,897.8	6,490.6	4,403.2	3,638.3	4,470.9	5,285.4	4,532.2

growth of commodity consumption will have no impact on world GDP. The same is evidenced by Fig. 5: when world GDP surpassed 60 TUSD, the interdependence became less tight. On the other hand for Russia and Iran,⁹⁵ for instance, the model indicates that increased hydrocarbon production and export will significantly improve national GDP.

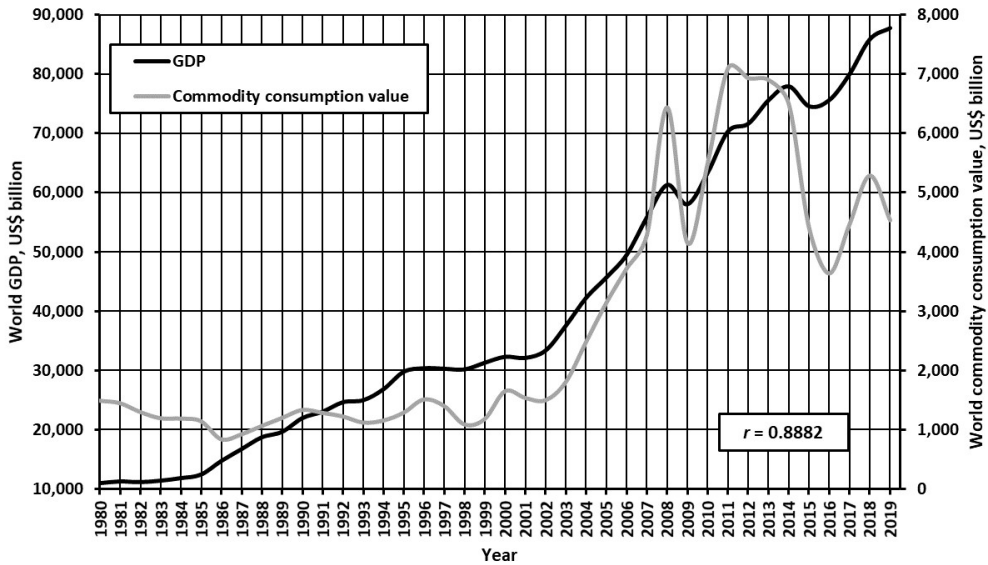


Figure 9. Interdependence between world GDP and nominal commodity consumption value.

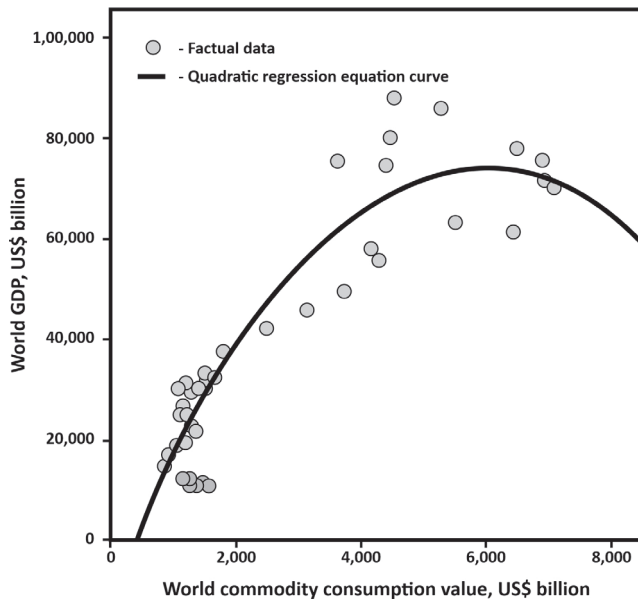


Figure 10. Model of interdependence between world GDP and commodity consumption value.

⁹⁵ Tvalchrelidze, A.G. (2021). Ibid., Figs 62 and 91.

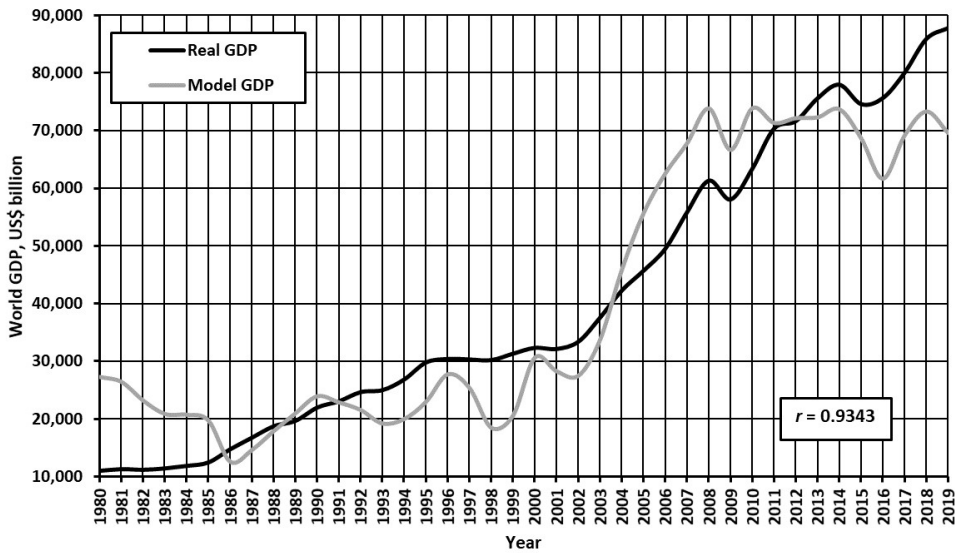


Figure 11. Comparison of real and model world GDP.

Thus, the financial instruments proposed in the Anglo-Saxon strategy have tactical rather than strategic importance. Their application may serve for quick global economic recovery but further increase of intangible vehicles in the value chain may become dangerous, as it happened in 2008 causing a world economic crisis. In other words, the strategy must be updated and include other economic instruments and technologies, ensuring development of green energy and world infrastructure as well as appropriately adjusting services and diminishing social and economic inequalities in the world. The first steps of the new USA administration have demonstrated that serious attention will be given to sustainable world development doctrines.

However, implementation of the updated Anglo-Saxon strategy in the globalized world for proper social and economic recovery and sustainable development needs a political and economic and social contract with allies. The first steps for restoring mutual understanding lost under Donald Trump's administration have been taken within the G7. The most important achievement of the summit was decision to deliver 1 milliard COVID vaccine doses to poor and low-income countries. This decision, initiated by Boris Johnson, at the time Prime Minister of the UK, betokened at least an initial readiness of the G7 to take responsibility for global sustainable development. Fewer contradictions between the desires of the EU and the USA are identified, hence a more synergetic global development can now be forecast.

Of course, such development aspirations will meet serious obstacles, traps and pitfalls starting with Islamic fundamentalism and Chinese ambitions to create a new geopolitical pole and finishing with Russia's aggressive politics in its "near abroad" and eastern Europe. That is why the Anglo-Saxon doctrine pays significant attention to provide logistical, financial and military support for democratic reforms in the "newly independent states" of the former Soviet Union and in other countries. No ideal garden will flourish on our globe; the serpent has not left it yet. But if this strategy is gradually implemented, more and more people will step-by-step acquire worthy living standards in free societies.

4. Concluding summary

The world COVID-19 pandemic has lapidarily highlighted shortcomings of our civilization and designated both challenges and opportunities for further social and economic development. The lessons of the pandemic should be analysed in depth in order to elaborate a sustainable, synergetic approach to the world's further development. These lessons are:

1. The coronavirus pandemic is characterized by global regularities of coextensive development in time and space. That is why its impact on our civilization has a cumulative character, which has practically the same effect in all countries despite their diverse levels of economic development, cultures, faiths, ethnical identities, geographic situations, climate and other essential features. The pandemic has strikingly demonstrated that this challenge may be combated only in a worldwide scale, when efforts of all countries and international organizations are synergistically united to achieve a goal that is incontrovertibly of global importance;

2. The absolute prerequisite for a proper reset is greater collaboration and coöperation within and between countries;

3. That is why globalization has no alternative; any reverse in globalization will retard social and economic recovery for decades; the world economy will need even more globalization in the future;

4. COVID-19 has made the need for greater investment in healthcare systems worldwide obvious;

5. The pandemic promoted the further development of modern IT technologies and accelerated digitization of the economy, diplomacy, education, culture and markets.

Fast economic recovery needs political and economic coöperation and a social contract between all states worldwide, and especially between the EU and the USA. The first steps for restoring mutual understanding within the G7, lost under Donald Trump's administration in the USA, have recently been enacted. An important sign of this restored understanding was the G7 decision, initiated by the then Prime Minister of the UK Boris Johnson, to deliver 1 milliard doses of COVID-19 vaccines to poor and low-income countries; the G7 thereby manifested a readiness to assume responsibility for sustainable development of world civilization.

The basic strategy for economic recovery, which is now being implemented, was elaborated in the USA and includes the fast development of capital and commodity markets promoted by a suitable fiscal policy. However, my investigations have revealed that the financial instruments of this strategy have tactical rather than strategic importance; their application may quickly initiate a global economic recovery but further increase of intangible vehicles in the value chain may become dangerous. The strategy must therefore be updated and include other economic instruments and new advanced technologies, appropriate for ensuring the development of green energy and world infrastructure as well as adjusting services to diminish social and economic inequality in the world.

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