Journal of Applied Economics and Business Research
JAEBR, 13 (1): 1-9 (2023)

Crises, Prolonged War, Sectoral Growth Opportunities

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Abstract
Starting with a discussion of the contradictory trends shaping the global economy in the 2020s, this essay focuses on three technology-intensive sectors: defense, pharmaceuticals, and energy. In the defense sector, the Russian-Ukraine war and the tensions in East Asia ended a long period of slow growth with a ´call to arms´ and rearmament across OECD. The challenge of the Western industries now is to accelerate output and capacity in a broad range of sub-sectors and support the safe supply of weapons and spare parts to the Ukrainian army. Thus, RUW is also a battle between different skills in management, logistics, leadership, and training systems, which offers a rich arena for future research in these fields.

In the pharmaceutical sector, the Covid-19 outbreak initiated another call to arms, and the industry was quick to respond by rapidly delivering new, effective vaccines. This coincided with a breakthrough for new approaches to cancer treatment, with a potential for major public health benefits, if the industry can handle the side effects and policymakers design cost-effective delivery systems with wide coverage. Again, this calls for focused research in the fields of management, innovation studies, and economics.

The third sector discussed in this essay, electricity production, was caught in a perfect storm by the outbreak of the new war. However, the net effect seems to be a major increase in investments in renewables. This creates new challenges regarding, for example, system stability, combinations of flexible and nuclear-based power sources, and the cost-effective diffusion of renewables to emerging economies, thus another arena for important future research.

Keywords: Crises, prolonged war, sectoral growth opportunities, defense industry, pharmaceutical industry, Green Energy

JEL Codes Classification: F50, F52, H56, LOO, N40, P18

1. Introduction

In an ambitious essay in the latest issue of JAEBR, Karabag and Imre (2022) take stock of the new conflicts, tensions, and wars, in particular the Russian war against Ukraine (RUW), shaping the global economy in this decade. The essay paints a bleak picture of deglobalization, national power struggles and rivalry, and the risk of an enduring second Cold War. Taken together, the observations suggest a contradictory future for the global economy, where some sectors continue to expand whereas sectors such as food production and food supply struggle, and "travel-based sectors" face the risks of long-term de-growth. The essay provides rich food for reflection. In this communication I will highlight three aspects: The probable persistence of the "New Cold War",

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the prospects for overall global growth in the 2020s, and the vitality of three knowledge-intensive industry sectors – defense, pharmaceutical, and "green power transformation".

2. A prolonged hot war in Europe with no end in sight

The Russian invasion of Ukraine in 2022 could justifiably be seen as the most serious challenge to the global order established in the UN Charter in 1945 and in the following international agreements, and a particular challenge to the liberal democratic order upheld by the North Atlantic community of countries. Hence it is rightly perceived as the starting point of the New Cold War. Unsurprisingly, Russia and Putin were quickly supported by the Chinese one-party regime, which is planning its own takeover of a democratic neighbor, the prosperous Taiwanese republic which has been separated from mainland China since 1895. However, as well-known in Newtonian physics, a force in one direction tends to provoke a counterforce in the opposite direction. Thus, instead of aggravating the previous tensions and fragmentation within the EU and the European-American collaboration, the Russian attack and the Chinese threat have reinvigorated European and cross-Atlantic cooperation and military integration. The European efforts to paralyze the Russian war machine by economic sanctions failed utterly, however. The Russian natural resource-based economy probably contracted by a few percentages, but as shown by WWII-experiences a totalitarian regime that refocuses the entire economy on war efforts may expand armaments production in spite of widespread destruction and a shrinking output of civilian products. Nazi Germany effectively lost the war in early 1943 and suffered from global sanctions as well as constantly increasing allied bomb campaigns. Nevertheless, the regime succeeded in increasing its production of warplanes and tanks by a factor three from 1942 to 1944 (Zetterling, 2017, p. 303).

In another similarity to the Second World War, the Russian invaders of Ukraine have committed so many war crimes that a negotiated peace between the existing Moscow regime and its foes seems virtually impossible. Thus there is a strong risk that the RUW will drag on for several years more, even if Moscow is fighting a losing battle. In addition to the destruction of Ukraine this will contribute to further deepening of the New Cold War. In the worst case, Xi Jin-ping will be encouraged to launch a full-scale invasion of Taiwan, which will trigger a US-Japanese response, and a localized hot war in East Asia. Such a development would deeply impact the global economy. Nothing is predetermined, however, and several factors including the New Cold and possible Hot wars are boosting growth in several technology-intensive sectors, as discussed in section 4.

3. The global economy – continued growth, lower rate, less China-dependent.

During the last 40 years, the global economy enjoyed an enduring growth between 3.5 and 4 percent annually, only interrupted by the financial crisis years 2009-2010 and the pandemic crisis in 2020. Will this performance continue during the 2020s? Here, it is important to reflect on the economic role of China. In the 1980s, her global role was negligible, but after the economic opening-up in the 1990s, China quickly became the main engine of the world's economic growth (Jinduo, 2019). According to WorldEconomics.com (2022), China accounted for 32% of global growth as measured by PPP (purchasing power parity) in the 2012 – 2022 period, India accounted for 14,7% and the US for 9,6%. IMF data shows that China's contribution to world economic

 ISSN 1927-033X

growth in 2018 was 21.7 percent, much higher than that of the US (16.3 percent) and the eurozone (8.2 percent). In 2021 - 2022, however, the growth of China slowed down considerably, as a consequence of the Chinese leaders´ insistence on massive lockdowns to reduce the diffusion of new Covid variants. After the change of Covid policy in late 2022, there will probably be a strong rebound effect in 2023. However, there are several reasons to assume that the power of the Chinese growth engine will decline in the 2020s. The first reason is the basic fact that China has developed into a mature and diversified middle-income economy where government pump-priming and infrastructure subsidies are much less effective. A second reason is related to the contradictions and liabilities of the hybrid capitalist regime of China´s making. In this regime, capitalist dynamics coexist with a Leninist party control, a strange mix exposed in the long neglected book The Party: The Secret World of China´s Communist Rulers (McGregor, 2010). With the erosion of collective decision-making and the rise of Xi Jin-ping as a one-man ruler, the balance in this hybrid economic structure is threatened by increasingly blunt government interventions in the economy and the curbing of China´s most successful tech entrepreneurs. The change of atmosphere has also dampened the appetite of foreign firms to commit to major investments in China, with the possible exception of Germany, Inc. On the other side, China has become the second largest market in the world, with a globally dominant position in several key industries. The Chinese economy will continue to grow, but most probably at a lower annual rate, and with a smaller contribution to global economic growth. This trend will be reinforced by the predicted contraction of the Chinese population, according to UN calculations.

In addition to efforts in Europe, North America, Australia and Japan, to reduce their strategic economic dependence on Chinese supply chains, the new uncertainties and the increased military threat of China will strengthen efforts by multinational enterprises to relocate their investments and production to other parts of Southeast Asia, e.g. Vietnam, Thailand and Indonesia. In this way the negative China factors might contribute to a more balanced and sustainable global economy.

4. Three robust growth sectors

The dominant economic regime – outside the emerging economies – in the 1980-2020 period was characterized by a strong reliance on monetary policies, low interest rates, low inflation, cheap and abundant credits – and an equally strong resistance to expansive financial policies. With the new inflation-focused policies of central banks in the OECD area, this has changed. Whereas monetary policies seek to reduce overall demand, Keynesian boost factors are returning across the board. Below I will discuss three advanced industry sectors, where this is particularly evident.

4.1. The defense industry – from stagnation to massive order backlogs

After the fall of the Berlin Wall in 1989, the opening up of the Chinese economy and the hopes of a democratic development in mainland China, a belief in protracted peace and economic cooperation engulfed many OECD economies, particularly in Europe, and the defense sector suffered. Oher conflict zones, especially in the Middle East, persisted and were aggravated by US interventions, however, and in the 2010s, the more aggressive stance of the Russian and Chinese leaders encouraged more military spending. From 2001 to 2021, worldwide military spending increased from 1139 billion USD to 2113 billion USD, measured in current prices (Statista, 2022). The economic effects of the Covid-19 pandemic did not end the upward trend in world military

 ISSN 1927-033X

expenditure since 2015 and its share of world gross domestic product reached 2.2 per cent in 2021, (Sipri.org, 2022). As a result of the RUW, these figures will now increase significantly. Far from the "de-growth" prospects in Europe in the 1990s, the problem of the defense industries, in both Europe and North America is to accelerate production output and capacity in a broad range of sub-sectors, from hand-held missiles and smart drones, advanced tanks and armored vehicles, to sophisticated long-range artillery systems and war planes. From a cynical marketing perspective, superior performance against the enemy in a military conflict, the ultimate form of competition, beats everything else, and Lockheed Martin will certainly enjoy rapidly increasing orders for its high mobility artillery rocket system (HIMARS). Overall, the Keynesian impact of the increases in military spending generated by RUW will probably make the defense industry a major growth sector for a considerable time. The immediate management challenge now is to handle steeply increasing order backlogs for ammunitions and systems which have survived the test of the battlefield.

History provides several examples of the rapid retooling of civilian economies for military purposes. A well-known case is Roosevelt's call to the American industry in November 1940 to become the "great arsenal of democracy" and safeguard the survival of Great Britain, who at that time was close to succumb under the onslaught of Germany´s Luftwaffe and submarines. Will the Western economies be able to respond effectively also this time?

4.2. Pharmaceutical industry – stronger than ever after the pandemic performance

Spending on healthcare and pharmaceutical products has historically been closely related to general growth and improvements in living standards. This has been evident in almost all advanced economies. In Europe, for example, the pharmaceutical sector more than doubled production in the first two decades of the 21st century, increased exports by a factor of six, and recorded a trade balance that put it far ahead of other high-tech sectors, according to reports from the European Industrial Pharmacists Group (Miglierini, 2022). In North America, the industry registered similar growth rates. The continent still represents the largest singular market area for pharmaceuticals, accounting for +40 % of the industry´s global revenue and a superior proportion of new launches. The emerging economies Brazil, India and China also registered robust growth, however, and the Chinese pharmaceutical market (at present 11% of the global market) is expected to increase at a compound annual rate of 12% in the 2020s. This growth has allowed China's healthcare industry to transition from a manufacturing base to a strategic R&D hub. A similar transition is taking place in India (delve.insight.com, 2021).

The Covid-pandemic inflicted a sharp, temporary dip in the GDP of most countries (Karabag, 2020). This did not include the pharmaceutical industry, however. On the contrary, the outbreak of Covid 19 and the new variants of the covid viruses have resulted in massive increases in public and private spending on vaccine and drug R&D, and on large-scale production facilities. In the West, Big Pharma was previously severely criticized for low productivity and a wasteful spending of resources on marketing rather than R&D. The rapid development and delivery of highly effective vaccines by leading firms, for example Pfizer and AstraZeneca, meant a reputation boost for the industry. Moreover, the process of researching and launching new types of vaccines seems to have opened avenues for promising R&D in other areas.

 ISSN 1927-033X

In a parallel development, long-term scientific investments have resulted in a range of new therapeutic approaches to cancer treatments, based on harnessing the body´s own immune system (Trafton, 2021). According to a recent review, this has "opened a new era in cancer treatment… /and/or breakthroughs in the treatment of various solid tumors, greatly improving the survival rate of cancer patients" (Bai et al., 2021).

This will have an enduring positive impact both on public health and corporate performance, as well as supporting continual investments in R&D programs to expand the range of treatable tumors, solve the difficult issues regarding the survival of advanced cancer patients and handle serious side effects of the new therapies. The broader goal of "curing cancer" is far from achieved, but amidst turmoil and troubles in other sectors, the pharmaceutical sector in a broad sense is making more stable and sustainable progress in recent years than it did for a long time.

The process of intensive and compressed vaccine development has also generated progress in initiating and managing asymmetric forms of industrial cooperation. An important case is represented by the successful cooperation between the US Big Pharma archetype Pfizer and the relatively new, midsized German research firm BioNTech (Bourla, 2021). Deeper studies of such forms of complementary and asymmetrical alliances might be highly fruitful.

4.3. The Green Energy Transition – An unexpected winner of the Russian invasion

Russia's invasion has had huge impact on the global energy market, by turning "a rapid economic recovery from the pandemic into full-blown energy turmoil. The world is in the midst of its first global energy crisis – a shock of unprecedented breadth and complexity." (IEA.org, 2022c).

Desperate of finding alternatives to Russian gas supplies, the immediate response of several European nations was to fire up coal plants and strike new fossil fuel delivery contracts. Thus the RUW seemed to sabotage the efforts in Europe and elsewhere to implement serious climate policies and curb greenhouse emissions, for example the Union´s "Fit for Fifty Five"-program (EuropeanCouncil, 2022). The October report by IEA on the global energy outlook in 2022, however, reported that the general scramble to reduce dependence on Russian oil and gas had resulted in a huge deployment of renewables globally which offset the expected increases in greenhouse gas pollution (IEA.org, 2022a).

According to IEA, the invasion had "turbo-charged" installations of solar, wind and other renewable sources in China and the European Union, and in a parallel development, also in North America. A crucial part here was the green policy package articulated in the bipartisan Inflation Reduction Act which passed Congress in August 2022. The legislation will channel nearly $370 billion in federal spending to decarbonization efforts over the next decade, the largest investment in clean energy and climate reduction programs in U.S. history. Power companies, which had balked at an earlier proposal for a national clean energy standard, applauded the tax credit provisions under the Inflation Reduction Act. The Edison Electric Institute, the trade group representing investor-owned utilities, called the law "transformational."

"Thanks to the [Inflation Reduction Act], clean energy businesses will benefit from stable, long-term tax incentives like those enjoyed by the fossil fuel sector for more than a century," Gregory Wetstone, president and CEO of the American Council on Renewable Energy, told lawmakers during a congressional hearing (spglobal.com, 2022). In a recent update, the IEA seeks to estimate the impact of all similar

 ISSN 1927-033X

programs and arrives at the optimistic forecast that renewables will make up 90% of global electricity capacity expansion between 2022 and 2027 (IEA.org, 2022b).

The U.S. subsidy program implies a broad Keynesian boost to a diversity of sectors, from mineral exploitation, battery cell production and electric vehicle manufacture to the assembly, installation and service of wind farms and photovoltaic parks, and various supporting industries. The support policies in the U.S. will probably be matched by similar programs in the EU. Ambitious programs to reduce dependence on fossil fuels are also implemented in Japan, Korea and India. According to IEA, these programs, if fully implemented, will result in a paradigmatic change in overall energy dependence: "Global fossil fuel use has risen alongside GDP since the start of the Industrial Revolution in the 18th century: putting this rise into reverse while continuing to expand the global economy will be a pivotal moment in energy history" (IEA.org, 2022c).

However, the current, positive trends of energy production are far from sufficient to achieve the long-term climate goals outlined in the Paris Agreement. Investments in clean energy are increasing in important countries, but there is a big shortfall "in emerging and developing economies, a worrying signal given their rapid projected growth in demand for energy services" (IEA.org, 2022c).

Another problem from the global climate mitigation perspective is the ageing and looming phase-out of nuclear power reactors in the OECD countries. This trend is exacerbated by the lack of investments, with the exception of France, Japan and Korea, in new nuclear power facilities. As noted in an IEA report published in 2019 "Nuclear power is the second-largest source of low-carbon electricity today, with 452 operating reactors providing 2700 Terawatt-hour (TWh) of electricity in 2018, or 10% of global electricity supply… Nuclear power and hydropower form the backbone of low-carbon electricity generation. Together, they provide three-quarters of global low-carbon generation" (IEA.org, 2019).

In an acute energy crisis, the operation of existing reactors needs to be prolonged as long as possible, especially in Europe - including Germany. But the erection of new plants is a much more time-consuming endeavor than the installation of mass-produced land-based wind turbines and solar parks, and thus no solution to the immediate problem of replacing Russian gas with other sources. Almost all existing nuclear power plants were designed and built in stand-alone projects with very little standardization and cross-project learning; the big exception being France and Sweden in the 1970s and 1980s. Here an exceptional expansion of nuclear power was organized in a project sequence management style (c.f. Berggren, 2019), directed by powerful government-controlled corporations. This resulted in continuous technical improvements, organizational learning, accumulation of design and project management expertise and inter-firm collaboration competence. When the domestic markets were satisfied, however, these industrial ecosystems started to fall apart. The replacement of the ageing reactors in the Western countries and the restoration of the role of nuclear power as a stabilizing and balancing fossil-free power resource will require a determined government hand with a focus on system-level stability and security in energy landscapes with high share of volatile, weather-dependent power sources.

As a whole, the international energy crises triggered by RUW has resulted in an extraordinary mix of imminent threats but also long-term investments and opportunities regarding energy supply and security as well as sustainable climate policies.

 ISSN 1927-033X

5. Conclusion and call for papers for the future

This essay suggests several themes for future research in the three analyzed sectors.

In the defense sector, political scientists could study the similarities and dissimilarities with WWII and the role of the US as the "arsenal of democracy"; organizational scholars should investigate the challenges of coordinating complex coalitions of countries to deliver advanced and SW-intensive weaponry to Ukraine; management specialists could focus on the challenges of supporting these deliveries with training and field services, while industrial economists explore the challenges of retooling and expanding the industry across the OECD area.

In the pharmaceutical sector, the vaccine R&D initiated by Covid 19 and the fruition of long-term R&D in cancer medicine and cancer therapies constitute another arena for important future research. To realize the public health prospects of the progress in pharmaceutical research, economists and innovation scholars need to engage in the design and evaluation of policies and incentive systems focused on reducing costs and increasing public availability. Organizational scholars should exploit the current window of opportunity to study asymmetric coalitions between large industry incumbents and agile, research-based entrants, and the reasons why some of these unequal partnerships actually deliver on their promises.

The global energy sector was directly hit by the new war in Europe. A first reaction was to restart retired fossil fuel plants, but then investments in renewable energy skyrocketed in the entire OECD area. In the big emerging economies, however, fossil fuel remains the preferred energy source. The closing of nuclear reactors in the advanced economies will drive CO2 emission, and create problems to stabilize energy systems, where volatile renewable sources become dominant. These trends call for research in several areas: studies of system behavior, system flexibility and system balancing, studies of incentive design and market governance that enable investments in capital-intensive technologies which deliver high stability and low operating costs, and studies of institutional and management factors that support sequences of investment projects in large-scale fossil-free power plants. Another important area is the study of transition trajectories from fossil-based to cost competitive fossil-free power production in emergent economies.

Funding

This work was supported by Energimyndigheten, The Swedish Energy Agency (grant number: 2020-024533).

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