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The Impact of War and Pandemic Crises on the Sovereign Creditworthiness and Solvency. The Position, Role and Decisions of International Rating Agencies

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Abstract

Theoretical background: The sovereign creditworthiness and solvency in the context of the pandemic and war crises is one of the biggest challenges that the modern world and the financial market face. It has a key impact on the basic economic indicators, including the price of debt incurred by individual countries and, thus, the profitability of debt securities. The COVID-19 pandemic, which began at the turn of 2019 and 2020, and Russia's aggression against Ukraine which started on 24 February 2022, have strongly impacted the level of debt of European states and other countries of the world. The energy crisis, which is currently

growing, is also taking its toll on the main economic indicators. International credit rating agencies are institutions that have been analysing the sovereign creditworthiness and solvency and individual business entities for many decades. At times, their activities have been the subject of criticism, but their place in the global financial market seems unthreatened and the results of their work still constitute the basic indicator of creditworthiness and solvency evaluation.

Purpose of the article: The purpose of this article is to present issues related to the impact of war and pandemic crises on the sovereign creditworthiness and solvency and also the position, role and decisions of international rating agencies. Due to the ongoing war in Ukraine and the COVID-19 pandemic, these are very important issues that have a real impact on the economic condition of individual countries as well as the standard of living of citizens. This article focuses on these elements of the contemporary reality.

Research methods: The subject matter and purpose of the article have been illustrated against the background of current theoretical knowledge, historical research and the latest analyses of key economic indicators, such as inflation or bond yields. The study of the impact of wars on sovereign ratings was empirical. To visualise the historical scale of the wars and pandemics destruction, in the analytical part of the study, statistical data has been re-scaled to the current global population.

Main findings: The research conducted in this article has indicated that crises related to a pandemic and war have a negative impact on the sovereign creditworthiness and solvency. Historical studies of armed conflicts and pandemics have shown that the former had a significantly greater impact on inflation and bond yields. For example, the level of inflation started to drop within one year after the end of the wars and almost immediately after the end of the pandemic. The same applied to bond yields. Of course, this was directly reflected in the evaluations of international rating agencies. The issues discussed in the article are of practical application, because the on-going war in Ukraine and the COVID-19 pandemic have had a very large impact on the global economy and the financial condition of individual countries. Our research also shows that the war hit the ratings of sovereign countries directly involved in the war, while other countries' ratings (possibly threatened by aggression from Russia in the future – e.g. EU countries) remain stable.

Introduction

Wars and pandemics have accompanied mankind since the dawn of time, and their theoretical concepts have been commonly known to almost everyone from the first years of primary school. Until now, they have been identified only through historical accounts, but their practical significance and empirical consequences have been felt in our country only recently. The COVID-19 pandemic with its global reach, appeared in Poland at the beginning of 2020 and generally, until the creation of this article, it has not officially ended and its effects are more or less still experienced. The war in Ukraine that has started on 24 February 2022, has opened a completely new chapter in modern history and it will have serious consequences in the long term. Both of the above-mentioned events have affected and continue to affect all aspects of functioning of Poland, the European Union as well as other countries and regions. They will result in far-reaching changes in the standard of living of citizens and other consequences in the broadly-defined social and economic sphere.

Taking the above aspects into account, the authors decided to focus their attention on those issues. Due to the above, the purpose of this article is to present issues related to the sovereign creditworthiness and solvency in the context of pandemic and war crises and also the position, role and decisions of international rating agencies. In the empirical part, we focused on showing the impact of the pandemic and the outbreak

of the war on economic indicators and examined the reactions of rating agencies to war activities. The latter issue has not been investigated so far due to the limited number of conflicts between countries with credit ratings awarded by international rating agencies. Thus, there is a research gap, especially in the area of the impact of wars and geopolitical risk on sovereign ratings. Research in this area will help to better understand the relationship between ratings and wars. The experience of various crises shows that credit rating agencies tend to overreact and severely downgrade their ratings after a crisis phenomenon has occurred. Research has also indicated that the reactions of credit rating agencies are often delayed, which questions the predictive function.

The ongoing war in Ukraine and the COVID-19 pandemic are issues that have a real impact on the economic condition of individual countries as well as the standard of living of their citizens. This article focuses on these elements of contemporary reality. The subject matter and purpose of the article have been presented against the background of the current theoretical knowledge and the latest research on key economic indicators, such as inflation or bond yields, as well as on phenomena related to potential insolvency and bankruptcy of states. Historical data on the most important wars and pandemics as well as their impact on economic parameters that play the most important role in the context of the sovereign creditworthiness constitute the background to the considerations.

The research carried out in this article has indicated that pandemic and war crises have a major impact on the sovereign creditworthiness and solvency. Historical research of armed conflicts and pandemics has shown very interesting trends that are discussed in one of the chapters hereof. They were directly reflected in the ratings of international credit rating agencies. Their level has a key impact on the price of debt issued by individual countries. To the best of our knowledge, this is the first work to illustrate the problem of the effect of wars on sovereign ratings.

The issues raised in this article also have practical implications, as the evaluation of credit rating agencies has continued to have a significant impact on the price of issued debt – also in our country, and this trend will continue. Its level has become very high and debt service from the point of view of the interests of the state budget should be as low-cost as possible. This, in turn, can be a difficult challenge in the face of the ongoing armed conflict abroad, the growing level of inflation, the energy crisis, etc.

The authors of this paper hope that the issues presented herein will shed a new point of view on the discussed issues and contribute to putting in order the theoretical and practical knowledge in this scope.

Theoretical introduction and definitions

The sovereign creditworthiness is closely linked to their solvency, ability to pay their debts and, in extreme cases, bankruptcy. While in the case of enterprises they are well defined, when it comes to entire countries the issue is no longer so simple and

obvious. In English-language literature, the inability of countries to settle liabilities is most often indicated as "bankruptcy" or "insolvency". There is also a formal concept of sovereign default, which is used, among others by the International Monetary Fund. Countries facing problems with repaying their liabilities balance between the state of insolvency and bankruptcy, which may be the essence of the term "sovereign default" (Nowicki, 2019; Faria et al., 2021).

In an extreme case, the treasury of a given country is completely incapable of servicing debt, but this does not result in the consequences known from the practice of companies and enterprises. Business entities in crisis situations often lose liquidity, do not have assets to settle liabilities, cease operating activities and disappear from the market (Boratyńska, 2009; Świerk & Banach, 2013; Jura, 2016; Gniadkowska-Szymańska, 2020). Of course, some successfully undergo a restructuring process that allows them to rebuild their financial position and continue to operate. In the case of enterprises, problems with repayment of liabilities may mean the so-called economic bankruptcy, which does not have to end in formal and legal bankruptcy (bankruptcy declared by a court judgment). When considering this issue from the other side, formal and legal bankruptcy always means economic bankruptcy (Prusak, 2004; Hohler & Cartier, 2022). However, it should be kept in mind that in such cases the state does not cease to function, its assets are not sold and it does not disappear "from the market" like a normal company (Buckley, 2009). Thus, the sovereign insolvency is somehow reversible and is only of an economic nature. Some literature sources even indicate some benefits resulting from more or less conscious decisions of authorities operating in some countries to suspend debt service and insolvency (Sandleris, 2016).

Such a scheme is appropriate for situations in which a given state suddenly stops paying interest and/or capital on its previously incurred liabilities in a timely manner. In the past, creditors of many countries have experienced this, including Argentina, Greece, Russia, Ecuador, Brazil, etc. (Buchheit & Galpern, 2013).

These types of phenomena may have many causes and be very complex (Szela et al., 2016), however, one of the key ones is generally the excessive budget deficit of a given country and a high level of debt (Furceri & Zdzienicka, 2012), which make it difficult or even impossible to pay off further obligations (Reinhart & Rogoff, 2010; Faria et al., 2021). Budgetary issues are often accompanied by several phenomena, including: an increase in the level of inflation, slower GDP growth, increase in the level of import and increase in the level of public debt. It then uses credits and loans from both domestic and foreign entities, which sometimes results in a further spiral of debt, an increase in debt servicing costs, etc. (Klimowicz, 2014; Roubini & Manasse, 2005).

Credit risk measurement methodologies are also used by other entities, which include credit rating agencies. In the case of identification of negative phenomena, they decide to downgrade the credit rating of a given country. This, in turn, automatically contributes to a decrease in investor confidence, an increase in the price of debt as well as difficulties in further financing.

One of the external factors that may contribute to the increase of credit risk and insolvency of states are discussed in the following parts of this study of the war and pandemics, the negative effects of which we are currently experiencing. The limited frameworks of this study do not allow for extensive theoretical considerations regarding those two phenomena. Nevertheless, some basic issues related to their definitions should be pointed out. One of the first theories of war is created by von Clausewitz, who defined it as "an act of violence aimed at forcing our opponents to fulfil our will". He also emphasized the continuity of violence with other political methods: "War is nothing more than a continuation of political relations, with a mixture of other means" (von Clausewitz, 1832/1911). According to some literature sources, war is a very specific and extreme form of violence (van der Dennen, 1977) as well as a conflict occurring on the periphery and in opposition to a normal functioning society (Kallen, 1939). On the other hand, in the world of science, there has been a discussion whether peace can be perhaps called a state of lack of wars? (Grieves, 1977). It may be controversial to state that the times of wars and peace do not generally differ in terms of the goals they pursue, but only in the means used to achieve them (Barbera, 1973). A sad conclusion may also be that in today's system of force politics there is no great difference between the state of peace and the state of war (Schwartzenberger, 1950). To some extent, the current situation in Europe confirms the assumptions of the so-called school of political realism. It maintains that "nation states" characterised by a high degree of so-called nationalism (such as modern Russia during the conflict in Ukraine), can pursue their interests only by demonstrating the will to fight and utilising wars of various scales as an instrument of national policy to achieve goals that are right from their point of view (Lider, 1977; Nobel, 1977).

The issue of the pandemic is also very important and complex. It is important to bear in mind a significant difference between the concept of epidemic and pandemic. Not every epidemic becomes a pandemic, because pandemics by definition have a very extensive or even global scope (Morens et al., 2009). The most synthetic and clear definition may be the one prepared by the World Health Organization: "pandemics – the worldwide spread of a new disease" (Singer et al., 2021). While it fits perfectly when it comes to the COVID-19 pandemic, one could discuss whether HIV causing AIDS is new in this sense and whether, despite being described as a pandemic, it still fits this definition (Singer et al., 2021).

However, the above theoretical considerations are neutral from the point of view of the issues described in the further chapters of this study.

Wars and pandemics – historical outline

Assuming that the history of mankind has been going on for almost 5,600 years, research has shown that during this time, approximately 15,000 wars and conflicts of various types, scope and intensity took place. This is not optimistic because the

above calculations show an average of three wars each year. Thus, it would be difficult to clearly separate periods of peace and periods of wars (Bodziany, 2013), which shows the fragility of the peace doctrines referred to for many centuries. In practice, they do not work too often, although there could undoubtedly be more conflicts without their existence. This, in turn, would lead to an even higher degree of destabilisation of individual regions, countries and continents affected by armed activities (Sweijs & Bertolini, 2022).

This can be evidenced by the period after World War II, which is paradoxically recognized and known as the so-called "period of peace" (1945–1990). However, this is an evaluation based solely on our own perspective. Between 150 and 160 conflicts of varying magnitude and scale erupted during this period. They resulted in the loss of approximately 7.2 million soldiers and from 33 to 34 million civilians (Toffler & Toffler, 2006; Bodziany, 2013). Another interesting and, at the same time, pessimistic fact is that the above-mentioned wars were carried out by 61 UN member states and in 1990 as many as 31 of them were in course.

A list of the 12 biggest armed conflicts that took place between the 17th and 20th centuries may be very interesting in terms of the discussed issue (Table 1). The 12 largest wars were measured by deaths, excluding regional wars without economic data. To visualize the scale of destruction, the fatalities data for wars (and the pandemic as well below) has been re-scaled to today's global population. Five of them had a global reach, as exemplified by the two World Wars from the beginning of the 20th century, the Thirty Years War or the Napoleonic Wars. The shortest war was the Spanish Civil War lasting two years and the longest was the Thirty Years' War lasting 29 years. The most people lost their lives during World War II (150–250 million people per current world population), and slightly less during World War I (80–120 million) and the Thirty Years' War (70–130 million). The average time of the above-mentioned wars was 7.8 years with a median of 5.5 years (Daly & Chankova, 2021; Cirillo & Taleb, 2020).

Table 1. History of selected and greatest wars

Event	Years	Duration (years)	Global?	Fatalities*
World War II	1939–1945	6	Yes	150–250 m
World War I	1914–1918	4	Yes	80–120 m
Thirty Years' War	1618–1647	29	Yes	70–130 m
Napoleonic Wars	1803–1814	11	Yes	35–45 m
Seven Years' War	1755–1762	7	Yes	10–12 m
First English Civil War	1642–1646	4		6–8 m
Vietnam War	1963–1973	10		5–8 m
Korean War	1950–1953	3		4–8 m
American Civil War	1861–1864	3		4–6 m
Spanish Civil War	1936–1938	2		2–3 m
Franco-Spanish War	1648–1658	10		2–3 m
Franco-Dutch War	1672–1677	5		2–3 m

Event	Years	Duration (years)	Global?	Fatalities*
	Avg. duration	7.8		
	Med. duration	5.5		

Source: Authors' own study based on (Daly & Chankova, 2021).
Notes: The 12 largest wars measured by deaths, excluding regional wars without economic data.
*The fatalities data for wars has been re-scaled to today's global population after (Cirillo & Taleb, 2020).

The biggest pandemics and their impact on the history of the world can be described in a similar way. Table 2 indicates the 12 selected pandemics, their severance and the number of victims. The fatalities data for pandemics has also been re-scaled to today's global population. The Black Death epidemic caused the greatest devastation in the 14th century, causing between 2 and 3 billion deaths (per current world population). The Spanish Flu, which is historically closer to us, resulted in approximately 150–200 million deaths. The average duration of the pandemic was 5 years with a median of 2 years. As you can see, their impact on the fate of many regions and generations was very large, and some of them even changed the course of history, which included the pandemic of the plague.

Table 2. History of selected and deadliest pandemics

Event	Years	Duration (years)	Global?	Fatalities*
Black death	1331–1353	22	Yes	2–3 bn
Spanish flu	1918–1920	2	Yes	150–200 m
Plague in Kingdom of Naples	1656–1658	2		15–16 m
Encephalitis lethargica pandemic	1915–1926	11	Yes	6–7 m
Third cholera pandemic	1848–1854	6	Yes	6–7 m
Plague in Spain	1596–1602	6		8–9 m
Asian flu	1957–1958	1	Yes	4.5–5.5 m
Russian flu	1889–1890	1	Yes	4–5 m
Italian plague	1629–1631	2		3–4 m
Hong Kong flu	1968–1969	1	Yes	2 m
Great plague of Seville	1647–1652	5		2 m
Great plague of London	1665–1666	1		1–1.5 m
	Avg. duration	5.0		
	Med. duration	2.0		

Source: Authors' own study based on (Daly & Chankova, 2021).
Notes: The 12 largest pandemics measured by deaths, excluding regional pandemics without economic data.
*The fatalities data for pandemics has been re-scaled to today's global population after (Cirillo & Taleb, 2020).

The examples of wars and pandemics indicated in the above lists are a certain fragment of history confirming the rule that both phenomena caused and still cause almost exclusively negative effects. The uncertainty related to the emergence of another armed conflict or epidemic is also with us today, examples of which are the COVID-19 pandemic or the war in Ukraine. They brought almost exclusively death, suffering, destruction and severe social and economic changes. It is difficult to find

any positive results, except for the acceleration of medical research in the area of prevention of further diseases and pandemics. Although some wars contributed to the transformation of political and social systems into a more just and democratic one, it was still at a high price for too many lives. So far, humanity has not found an effective antidote in order to completely eliminate them.

The impact of wars and pandemics on the economy and key economic indicators

Due to obvious reasons, wars have a negative impact on almost all areas of life of the countries affected by them and their citizens. Infrastructure and worksites are destroyed, the normal functioning of the society is being disrupted, while causing inadequate damage to the life and health of citizens. This, in turn, most often translates into a reduction in the level of GDP (Barro, 1991; Global Outlook, 2022). It should be noted, however, that due to the complex mechanisms of GDP level calculation, the direct impact of armed conflicts on the level of this indicator may not reflect the actual scale of the negative phenomena of war activities. On the one hand, it may take into account the increased demand for certain goods and services and, on the other hand, it does not include human losses and the associated consequences for the development of the economy (Thies & Baum, 2020).

Nevertheless, going back historically, one can risk the statement that in some sense some wars could have been economically beneficial. Since the dawn of history, the desire to improve the condition of one's economy by plundering someone else's wealth and the territories of other countries has been one of the main drivers of armed conflicts. Indeed, some were killed in combat, but those who survived often gained significant wealth, slaves and loot. Looking from today's perspective, the old wars were relatively "cheap". They did not generate gigantic costs of armament, did not require extensive logistics and involvement of almost all branches of the economy. This meant that the economic benefits of the attacking countries could be higher than their economic costs.

Modern wars are completely different, because they generate very high costs related to the production of weapons, maintaining the army and the long-term conduct of warfare. Currently, armies need large quantities of fuel, raw materials for the production of weapons and ammunition, food, etc. In addition, in the era of globalisation, armed conflicts cause disturbances to the international economic balance, which is often met with dissatisfaction and economic sanctions. An excellent example are those imposed on Russia after the aggression against Ukraine. In addition, social awareness and attachment to national history and values are significantly stronger now than a few or a dozen centuries ago. The attacked or occupied nations do not accept this fact and actively resist. This, in turn, from the point of view of the aggressors, results in an increase in the economic costs of warfare, a decrease in the morale of soldiers, etc. Countries directly involved in warfare and victims of assault from other countries (as is currently the case in Ukraine) are experiencing

a number of negative phenomena, e.g. GDP decrease, loss to people, destruction of infrastructure, increase in inflation, social and psychological costs and many others.

At the same time, specifically in countries that do not participate in an armed conflict, wars can generate: demand for selected goods and services, employment growth in certain sectors of the economy, increase in inflation, increase in the price of energy raw materials and decrease in the supply of certain goods and services.

However, some of the above-mentioned effects of wars with a positive dimension could be achieved in times of peace and the effectiveness of spending funds would obviously be much higher. As mentioned before, taking into account certain points of view, wars, however, paradoxically, may seem beneficial to some countries, entities or persons, particularly those not directly affected by war activities. They can have an impact on increasing the demand for certain goods or services, increasing employment, implementing innovations or progressing profits.

However, such a point of view, focused on the "economic benefits" of wars, should be critically assessed through the prism of the so-called "broken window fallacy". The resources spent on war may generate a high demand, but at the same time represent a huge alternative cost. It should be understood as a mechanism in which these funds could be used for the development and improvement of the economic situation, various branches of the economy, education, health care, etc., instead of expanding the arms industry and spending huge amounts on the reconstruction of the damaged infrastructure. For example, the alternative cost of the war in Iraq was estimated at USD 860 billion at the end of 2009 (Pettinger, 2022). In simple terms, the resources spent on war-related destruction would benefit much more in time of peace.

The impact of wars and pandemics on key economic indicators, which include inflation and bond yield, is very important for these considerations. They have a significant impact on the solvency and creditworthiness of the countries and regions affected. Research regarding the historical impact of the most important global armed conflicts showed that the level of inflation increased after their start and with varying intensity during their course. A very interesting phenomenon was also its increase after the end of the war, where the median showed as much as 8% in this parameter, i.e. approximately 2–3 percentage points above the level at the end of the wars. The highest level of inflation was recorded by in the period within one year after the end of the wars and then it had a downward trend (Daly & Chankova, 2021). Therefore, it can be assumed that if the war in Ukraine ended in 2022, inflation would have an upward trend until the end of 2023.

Slightly different conclusions were evidenced by the research on the impact of the pandemic on the level of this parameter. While after the beginning of the pandemic inflation usually increased (although to a smaller extent than in the case of wars), it already had a downward trend at the time of its end (Daly & Chankova, 2021).

By applying these regularities to the current geopolitical situation, when the war in Ukraine as well as the COVID-19 pandemic are ongoing, it is difficult to estimate the future inflation levels in individual regions of our globe.

A similar mechanism as in the case of inflation took place at the level of bond yield. A research (Daly & Chankova, 2021) showed that their profitability grew more during wars than pandemics, which means, or at least in the past meant, that wars had a more negative impact on the world economy. It should be kept in mind that the historical periods of wars were associated with the high borrowing needs of individual countries, which resulted in the issuance of high value bonds (including the so-called war bonds). This, in turn, had a major impact on their valuation and profitability, as war activities significantly increase the risk of potential insolvency or delays in repayment of liabilities. In this case, the sovereign creditworthiness directly or indirectly involved in armed conflict declined significantly.

At the moment, when COVID-19 has perhaps caused the most severe effects on the global economy, this phenomenon may be assessed in a slightly different way. During the pandemic, debt securities were issued almost all over the world to mitigate the effects of lock-downs. Therefore, it can be stated as a certain generalisation that COVID-19 was a period resembling periods of wars in this respect. Nevertheless, before a reliable evaluation of this period is made, it is necessary to wait for the definitive conclusion of this chapter of history (as of the date of writing this paper, the pandemic is still officially ongoing).

The role of international credit rating agencies in the evaluation of the sovereign creditworthiness and solvency

Credit rating agencies play a large role in the evaluation of the sovereign creditworthiness and solvency in the today's world. By means of a credit rating, they can present the classification of countries in terms of insolvency risk on a rating scale in a synthetic way. Nearly 80% of countries in the world (according to the authors' calculations, at least 153 countries out of 193 in the world have a rating) are rated by international rating agencies. "Since the beginning of the 19th century, most sovereign defaults have occurred because a defaulting sovereign's past policies left it badly prepared to face an unexpected turn of events" (*Sovereign…*, 2014).

"The sovereign credit ratings of S&P, Moody's and Fitch indicate the capacity and willingness of rated governments to repay commercial debt obligations in full and time" (Bhatia, 2002). "The major rating agencies commonly limit their time horizon to between two and three years" (Amstad & Packer, 2015). These ratings have a large impact on the price conditions of capital borrowed by governments (Overes & Vel, 2022).

International credit rating agencies apply a quantitative and qualitative approach. The sovereign rating is distinguished from other ratings made by credit rating agencies. In addition to economic (mainly macroeconomic) factors, political (including geopolitical) criteria are also important. The number of criteria and benchmarks used by credit rating agencies to assess countries is relatively high. "These include

measures of fiscal strength (such as public debt and interest cost burdens), economic strength (per capita GDP, output growth and inflation), institutional strength (governance, the rule of law and corruption), the monetary regime (exchange rate flexibility, reserve currency status) and other factors such as foreign exchange reserves, monetary aggregates and credit to GDP" (Amstad & Packer, 2015). An approach based on a large number of rating criteria is dictated by the complexity of entities such as countries, but on the other hand, there is a risk of cross-correlations between evaluation criteria, which inadvertently increases the role of some criteria in the overall evaluation. Moreover, studies show that the rating made by large international credit rating agencies can be explained by a limited set of macroeconomic variables, which undermines the use of a very broad set of indicators to assess countries. Among the macroeconomic factors, the sovereign rating determines GDP per capita, GDP growth rate, inflation, foreign debt, economic development and default history (Packer & Cantor, 1996). The above-mentioned authors "do not find any systematic relationship between ratings and either fiscal or current deficits, perhaps because of the endogeneity of fiscal policy and international capital flows" (Packer & Cantor, 1996). Indicators such as therule of law, political stability, voice of the people, corruption control, government effectiveness and regulatory quality play a huge role in explaining the credibility of states (Butler & Fauver, 2006).

Credit rating agencies are TTC-type ratings (through the cycle approach), which means that they are subject to change only when, in the opinion of the credit rating agency, there are fundamental changes in the situation of the rated country. For credit rating agencies, the stability of the rating is more important than its accuracy. This causes delays in credit rating agencies changing their rating. The rating forecasting function is limited. Credit rating agencies and their ratings show a tendency to react to changes and financial crises instead of anticipating them (Flandreau et al., 2010). "During the 1920s and 1930s, the four main credit rating agencies (Fitch, Moody's, Poor's, and Standard Statistics) failed to anticipate the sovereign debt crisis that broke out in 1931, and they overreacted by making massive downgrades well into 1933" (Gaillard, 2012). Another problem is the asymmetry of the reaction of credit rating agencies in the sense that the periods of rating downgrades are shorter than the periods when the rating is upgraded (Broto & Sanchez, 2015). "In other words, a country can be abruptly downgraded but it takes a long time for it to recover its rating" (Broto & Sanchez, 2015). The reactions of credit rating agencies are,therefore, also herd-like.

The role of sovereign ratings has increased as the level of internationalisation of financial markets has increased. In general, the sovereign rating is seen as a measure of the risk of insolvency. "Credit ratings aim to assess the debt issuer default risk and help investors to determine the risk premium they should demand to compensate for this default risk" (Luitel & Vanpée, 2018). Downgrading the rating (especially the transition from the investment class to speculative class) results in an increase in the risk premium, which means a higher cost of money borrowed by the state.

A sovereign rating carries out a pricing function resulting from the strong relationship between the rating and the cost at which the state borrows funds. Studies of a sample of 20 countries (the study was conducted on data obtained in 1998–2015) show that "a downgrade to sub-investment grade on the foreign currency rating is associated with an average increase of 138 basis point in T-bill rates" (Hanush et al., 2016).

The quality of the sovereign rating is crucial for the rating system as a whole. The sovereign rating is the upper limit for the ratings of entities from a given country, although currently credit rating agencies do not rigidly apply this principle (Niedziółka, 2021). The link between the situation of a country and the condition of enterprises as well as financial institutions established in that country seems obvious. The economic environment, institutional order, political conditions and the financial system are considered to be important factors influencing the financial situation of enterprises. The occurrence of disruption (e.g. financial crisis, war or pandemic) affects the situation and the risk of state and corporate insolvency. Such a distortion may, therefore, result in a rating downgrade.

Nowadays, credit rating agencies play the role of gatekeepers to the debt market. A sovereign credit rating is a tool enabling a given country to raise funds from the issue of bonds on international markets. Thanks to the sovereign rating, the government is less dependent on bank financing (Luitel & Vanpée, 2018). A good rating contributes to building the position of the state and confidence in it on the part of investors. Sovereign ratings are particularly important for developing countries because capital flows from rich to poor countries are largely regulated by the risk of insolvency (Reinhart & Rogoff, 2004).

Changes in the sovereign rating and reactions of rating agencies after the outbreak of the COVID-19 pandemic and the Russian aggression against Ukraine

In this section of the article, we present the results of a study of the impact of pandemics and wars on sovereign ratings. The study of the impact of the COVID-19 pandemic on the rating was intended to present the state of knowledge on the impact of health crises on the reactions of rating agencies and the sovereign rating. The study of the impact of wars on sovereign ratings was empirical. The study considered the most important armed conflicts taking place since the sovereign rating became widespread. On the research tools side, the study consisted of analysing the reactions of rating agencies to the outbreak of wars. When examining the reactions of the rating agencies, we took into account the time elapsed between the outbreak of war and the change in credit rating or rating outlook, the character of the reaction (drop into the speculative-grade category, notches, delayed reaction).

The COVID-19 pandemic has led to a global health crisis and caused significant damage to the global economy. The outbreak of the COVID-19 pandemic crisis

brought an unprecedented economic recession (the largest since the Second World War). In the event of a global financial crisis, credit rating agencies have failed, which has also led to serious criticism of their functioning and role in the economy. It was stated that rating agencies did not foresee the 2007 financial crisis and were criticised for their slow reactions. Early over-rating of securities based on the mechanism of securitisation has become apparent.

In this context, let us look at the responses of credit rating agencies to the COVID-19-related crisis. So far, no theoretical models have been developed showing the impact of the pandemic on the rating. The last pandemic of such magnitude and consequences as COVID-19 occurred at an early stage in the development of credit rating agencies. Looking at the criteria used by credit rating agencies, the pandemic negatively affects the rating by lowering the economic strength of the state and fiscal strength. The impact of a pandemic on a state's rating may be long-term and does not have to return to the level before the pandemic with the economic rebound following the end of the severe phase of the pandemic and the end of lockdowns. A relatively high level of inflation is the effect of the pandemic. As it develops, the risk of stagflation increases.

In 2021, an international team of scientists published the results of research aimed at examining whether the intensification of the health crisis related to COVID-19 had an impact on the activities in the area of country credit ratings conducted by three main credit rating agencies (Tran et al., 2021). Studies show that credit rating agencies have used the "business as usual" approach and have maintained their exchange rate. Typically, rating activities were postponed to credit committee meetings scheduled before the pandemic (Tran et al., 2021). "The leisurely pace in the fast-evolving risk landscape may be a result of the fact that there is so little competition in their field of business" (Kraemer, 2021). Moreover, the cited studies show that the sovereign ratings responded to economic changes caused by the pandemic, and not directly to the intensity of the health crisis (morbidity and mortality rates) (Tran et al., 2021).

Estimates show that in the period of COVID-19, the three largest rating agencies downgraded the rating of 20% of countries (Korzeb et al., 2021). Such a large scale of cuts in the sovereign ratings has not been observed since the subprime crisis (Korzeb et al., 2021, p. 148). However, the main burden of downgrades was incurred by developing countries, despite milder declines in macroeconomic indicators (United Nations, 2022).

Sovereign credit ratings of European countries remained relatively stable during the COVID-19 pandemic, despite a significant increase in public debt (Arnal et al., 2021). The number of downgrades of state and corporate ratings was significantly lower compared to the situation during the global financial crisis (Arnal et al., 2021). The data presented in the figure show that during the pandemic crisis there were naturally downgrades of ratings, but these were mild downgrades. The global financial and debt crises in the Eurozone countries have led to much stronger reactions from credit rating agencies.

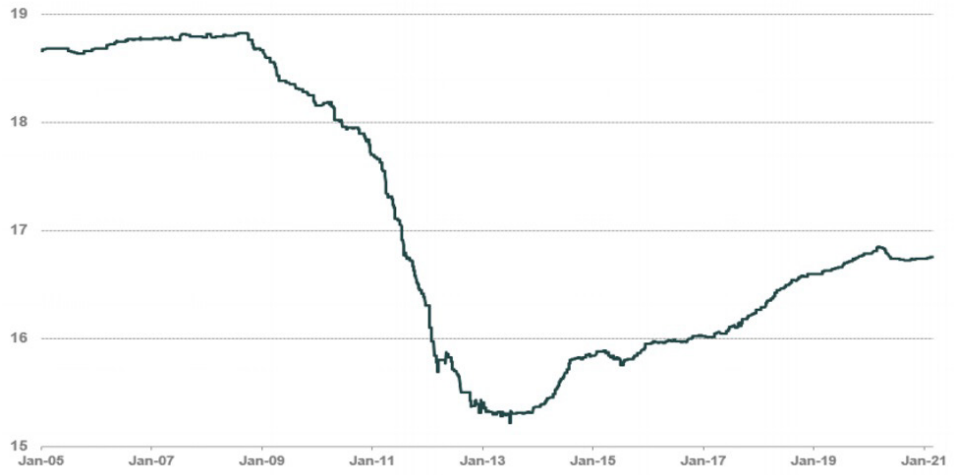

Figure 1. Average sovereign rating calculated for the Eurozone in 2005–2021

Source: (Arnal et al., 2021).

A different response from rating agencies to the pandemic crisis than to the previous global financial crisis is explained by the specificity of the crisis caused by COVID-19, the fact that when the pandemic unfolded, ratings were lower than before the outbreak of the global financial crisis, and governments reacted strongly to the crisis (Arnal et al., 2021). It is also emphasised that strengthening the regulatory and supervisory framework for rating agencies in the EU through the 2009, 2011 and 2013 reforms has undoubtedly helped to reduce any pro-cyclical behaviour in ratings (Arnal et al., 2021).

Interregional differences in the area of downgrading country ratings under the influence of the pandemic crisis and stronger reactions of credit rating agencies in relation to developing countries can be justified by the fact that wealthy and diverse countries are more resistant to shocks than poorer, more vulnerable economies (Griffith-Jones & Kraemer, 2021). It is also worth remembering that in rating committees, most managers and rating analysts are citizens of developed economies (Griffith-Jones & Kraemer, 2021). They may not understand emerging economies and may underestimate developing countries in times of turbulence.

In the context of the pandemic, an interesting research problem is the impact of government support measures (GSMs) on country ratings. Government support measures were one of the most important elements of defending states against the COVID-19 crisis and mitigating its effects on entrepreneurs. This aspect is also extremely important for understanding the relatively low scale of downgrades due to the pandemic compared to previous crises and the scale of the pandemic shock. Despite the increase in debt incurred by national governments, the total number of rating actions towards states was limited, because credit rating agencies took into

account the scale of actions taken to mitigate the pandemic crisis (*Observed*..., 2021). "The impact of GSMs on sovereign credit ratings is generally a result of GSMs' impact on the economic situation (e.g., the impact on public finances (tax receipts) and the impact of increased volumes of debt)" (*Observed*..., 2021). Monetary policy increasing the financing of the banking sector had a positive impact on country ratings (*Observed*..., 2021).

In the empirical part, we focused on examining the impact of the outbreak of war on ratings. The first ratings were issued by Moody's before World War I. The impact of wars on the rating could already be observed at the moment of the outbreak of World War II. Standard Statistics (today S&P) lowered the rating of Germany (after the attack on Poland in September 1939 to level D, meaning insolvency).

A war on such a large scale and potentially very large impact on the world economy and its prospects, due to the importance of the countries participating in the conflict, is so rare that there is no research showing the impact of the outbreak of the war and its duration on the sovereign rating. However, this is certainly an event of such importance that it forces rating agencies to verify the ratings of individual countries, although they do not explicitly present methods for assessing this aspect in the rating methodologies. Credit rating agencies point to the risk of war in the political risk evaluation.

In theory, war affects the ratings of individual states and a significant increase in the risk of insolvency in a direct and indirect way. It has a direct impact on countries where war is taking place. War means changes will take place in the structure of the economy (the need to convert part of the production capacity for the purposes of warfare), demographic changes (the flight of people outside the borders of a state affected by the war and the need for the working-age population to participate in warfare), a decrease in tax revenues and disruptions in the activities of public institutions. These elements are particularly important in the case of the attacked country. However, in the case of an attacking state, the accents may spread differently, especially if the state does not involve all its resources in the war. In the analysed war, economic sanctions and capital restrictions come to the fore in the case of the aggressor state (Russia).

The war affects the neighbouring and remote countries indirectly, while the risk of downgrading the rating and the level of the possible downgrading depend on the negative impact of the war on the economy of neighbouring countries. The duration of the war is very important in this case. Blackmail of the aggressor state (e.g. energy-related blackmail) may also be important for the rating of the state in the event of war. If such blackmail materialises, its effects on the economies of the neighbouring countries may be so significant that they will lead to a downgrade of the rating.

The war may also have a negative indirect impact on countries distant from the parties to the conflict. The food crisis is the channel through which the effects of war on these countries are transmitted.

The war has increased uncertainty among investors around the world due to its impact on macroeconomic prospects and credit conditions. This may, in turn, lead

to a downgrade of the average rating level. War is also an economic sanction that restricts or prevents the movement of capital.

In the case of the Ukrainian-Russian war, the moment of Russian aggression is also important. It occurred during the times of many countries coming out of the pandemic crisis and during the period of increasing inflation and the threat of stagflation.

According to the rating agency Fitch, war affects the sovereign ratings (not directly involved in war) through (Fitch Ratings, 2021):

– direct exposures to the affected countries,

– wider macroeconomic spillovers such as higher commodity prices and more severe inflation,

– impact on policy settings.

There is not much data on this subject, because wars took place in the 21st century mainly in countries with very low ratings or in countries without a rating. As part of the study, we looked at the following armed conflicts:

– the Second Lebanese War,

– the Russo-Georgian War,

– the Nagorno-Karabakh War.

The Second Lebanese War, which broke out on 12 July 2006, did not change the rating of Lebanon and Israel (the parties to the conflict). The Russo-Georgian War (the conflict began on 8 August 2008 and took place between Georgia and the Ossetian and Abkhazian separatists supported by Russia) caused Georgia's rating to drop by one degree (the rating agency Fitch downgraded the rating from BB- to B+ with a negative outlook). In the case of the Nagorno-Karabakh conflict (which began on 27 September 2020 and lasted until 10 November), S&P changed Azerbaijan's outlook from stable to negative, maintaining its rating at the speculative level (BB+). Fitch, on the other hand, downgraded Armenia's rating from BB- to B+. The conclusion of the above analysis is unambiguous. Rating agencies do not react too suddenly to armed conflicts when their scale is limited. They usually make adjustments to the rating outlook.

When examining the reactions of rating agencies to Russia's aggression against Ukraine, we divided countries into the following groups:

– countries directly involved in the war (Ukraine, Russia, Belarus),

– states with a significant increase in the risk of Russian aggression over several years (Kazakhstan, Moldova, Georgia),

– post-communist countries supporting Ukraine in the war with Russia (Estonia, Czech Republic, Lithuania, Latvia, Poland, Romania, Slovakia),

– "old" European Union states with relatively strong economic ties with Russia (France, Germany, Italy) and exposure to the Russian gas market,

– countries aspiring to join NATO due to the Russian threat (Finland, Sweden).

We analysed the reactions of the three largest rating agencies in the world (Fitch, Moody's and S&P) to the outbreak of war (aggression by Russia) and possible changes in the rating and its outlook. The long-term rating for foreign currency debt

was analysed. When analysing the reactions of credit rating agencies, we searched for answers to the following questions:

1. What was the scale of rating changes from the outbreak of the war to mid-August 2022?
2. Did the perspective of the rating change after the outbreak of the war in the analysed countries?
3. Has there been a consensus between the rating agencies in response to the outbreak of the war?

The latter aspect may have impacted the occurrence, deepening or downgrading of a split rating. It is worth recalling that split rating signals discrepancies between rating agencies and is a measure of uncertainty about the credibility of the issuer and the likelihood that interest and principal will be paid on schedule. The greater the split rating, the higher the level of uncertainty.

In the group of countries directly involved in the war, ratings were subject to decreasing (Table 3). Russia's credit rating before the aggression against Ukraine was at the investment level with a stable outlook. This distinguished Russia in a positive way from the other two countries involved in the conflict, because in the case of Belarus and Ukraine, the rating was at the speculative level immediately before the outbreak of the war. After the outbreak of the war, there was a downgrade in the rating of all the countries affected by the conflict. In the case of Russia, after the initial rating downgrades (in the case of Moody's rating, the first downgrade to B3 took place on 3 March 2022, and the second on 6 March 2022, to Ca with a negative outlook), the three largest rating agencies decided to withdraw the rating. The first drops were already painful for Russia, as there was a shift from investment to speculation. This type of change is particularly painful because there is a surge in the cost of money. This is a cut-off point for institutional investors who cannot invest in junk bonds, due to regulatory constraints. For Russia, the withdrawal of the rating means in practice that it is impossible to incur debt on international markets. In the case of Belarus and Ukraine, a split rating was recorded (as of 20 August 2022).

Table 3. Sovereign rating directly involved in the war before its outbreak and on 18 August 2022

Country	Credit rating on the day of the outbreak of war			Credit rating as of 20 August 2022		
	Moody's	S&P	Fitch	Moody's	S&P	Fitch
Belarus	B3 (n)	B (n)	B	Ca (n)	SD	RD
Russia	Baa3 (s)	BB+	BBB (s)	RW	RW	RW
Ukraine	B3 (s)	B- (s)	B	Caa3	SD	CC

Key: (s) – stable outlook, (n) – negative outlook, RD – restricted default, SD – selective default, RW – rating withdrawal
Source: Authors' own study based on data on ratings issued by individual credit rating agencies.

The conflict also triggered high activity of credit rating agencies in relation to the countries affected by the conflict. Let us look at this problem taking Ukraine as an example (Table 4).

Table 4. Changes in the long-term rating of Ukraine rating outlook from the outbreak of war until 20 August 2022

Date	Moody's	S&P	Fitch
24 February (day of the conflict outbreak)	B3	B	B stable
25 February	B3 under review		
26 February		B-negative watch	CCC
4 March	Caa2 under review		
6 March	Caa3 negative		
27 May		CCC+ negative	
22 July			
29 July		CC negative	
12 August		SD	RD
18 August			CC

Source: Authors' own study based on data on ratings issued by individual credit rating agencies.

The analysis of Ukraine's rating indicates that with increase of the conflict, the rating agencies gradually downgraded their rating. It is interesting to note that this proves the high uncertainty as to the actual standing of Ukraine and the possibility of timely repayment of its debt in the medium-term perspective. It was also interesting to see how Fitch acted, lowering the rating to the level of insolvency and returning to the speculative assessment (CC) within a few days. The change of the rating from RD to CC was motivated by the approval by the main bondholders of the deferral of coupons.

The sovereign rating with a significant risk of aggression by Russia has not changed after the Russian aggression against Ukraine. Kazakhstan had a low investment rating at the end of July 2022 from three rating agencies (Ba2 – Moody's, BBB- – S&P and BBB – Fitch). The stable rating outlook for this country has not changed after the Russian aggression. However, Moldova's rating outlook has changed. Moody's rating of that country was at the speculative level (B3) at the end of July 2022. Under the impact of the war, the outlook of the rating changed from stable to negative. An interesting situation was observed in the case of Georgia. At the end of July 2022, Georgia's rating was at the speculative level (Ba2 – Moody's, BB – S&P) and it did not change after the outbreak of the war. However, the rating outlook changed, in the opposite direction (Moody's changed the outlook from stable to negative, while S&P from negative to stable).

Ratings have not changed in the remaining surveyed groups of countries. The war has not led to changes in the rating outlook. The agencies have adopted a wait-and-see position.

The results of the research indicate that the outbreak of war itself (Russia's aggression against Ukraine) influenced the rating to a very limited extent. Only countries directly involved in the war were affected by the rating changes. Nevertheless, it should be noted that along with the prolonged armed conflict, the risk of rating changes and lowering the average rating level in the world increases. Countries with a strong exposure to the Russian gas market are at risk of downgrading, as they face a high risk of economic downturn through rising energy prices.

Conclusions

The historical research presented in this article regarding pandemics and wars has shown that they have accompanied us since the dawn of time. Nevertheless, we have experienced their effects empirically, in a very short and intense period of just the last two years. Both successive events – the pandemic and the war in Ukraine – have accumulated a number of phenomena that have a direct impact on key economic indicators as well as the financial condition of individual continents, regions, countries and citizens. One of the most visible and, at the same time, most noticeable effects were: increases in debt, budget deficit, inflation, bond yields, energy prices, etc. They had and still have a direct impact on the reduction in the standard of living of citizens, which is also noticeable in Poland. The scale of these phenomena is currently increasing and it is difficult to estimate the approximate time for the global economy and local economies to return to a balanced level. The historical research presented in this study, however, allows to indicate the approximate time in which inflation and bond profitability (as a specific measure of the risk of investment in treasury bonds) may return to normal. While in the case of pandemics, this has taken place almost immediately after the end of a given pandemic, in the case of wars the time was longer and was not less than a year.

Taking into account the fact that both phenomena are still ongoing, they have a key impact on the so-called sovereign creditworthiness and solvency whose ability to settle liabilities in a timely manner has in many cases been put to the test.

In this article, the authors, therefore, focused their attention on presenting issues related to the broadly-defined sovereign solvency and creditworthiness in the face of a pandemic and war crisis. International credit rating agencies, whose primary task is to measure and assess financial standing and creditworthiness, are the institutions that play a key role in this area. Creditworthiness of states has recently come under strong pressure from the pandemic and the Ukrainian-Russian war. Certainly, the countries most affected by the war are the countries participating in it, but due to the importance of raw materials available in Russia and Ukraine, other countries are also experiencing problems, which may result in a deterioration of their creditworthiness in the future. An important and acceptable measure for assessing the direction of changes in creditworthiness by international investors is the rating of international rating agencies. In the research part, we conducted an analysis of the reaction of rating agencies to Russian aggression against Ukraine. The rating downgrades affected the countries directly involved in the war, while in the case of other countries that are affected by the war in Ukraine, either by an increase in the risk of Russian aggression or by an increase in energy prices, the rating agencies adopted a wait-and-see attitude and did not change the ratings.

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