The Journal of International Relations, Peace Studies, and Development

Volume 8
Issue 1 *The Journal of International Relations, Peace Studies, and Development*
Article 7

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The Journal of International Relations, Peace and Development Studies
A publication by Arcadia University and the American Graduate School in Paris

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Abstract

Geopolitical risks (GPRs) have varied consequences over countries and over time. COVID-19 and the war in Ukraine are some of the recent GPRs. The conflict in Ukraine has had far-reaching economic consequences, not only for the countries directly involved in it but also for their trading partners and allies, and on the global economy in general. France, as one of Ukraine and Russia's major trading partners, has also felt the impact of the conflict on its economy. Using data from the French National Institute of Statistics and Economic Studies (INSEE), the paper investigates the impact of GPRs caused by the war in Ukraine on price variation and citizen trust in France. The article conducts a multilinear regression analysis on datasets going back from immediately after the financial global crisis until the first quarter of 2023, with the war in Ukraine still ongoing. Results show that GPRs strongly affect the rise of prices of different products from oil products to food, beverages and other industry products, the association varying from strong to moderate. GPRs are also positively related to a reduction in citizen trust. The relationship between war and price, on the one hand, and the association between war and decrease in trust on the other, is confirmed by robustness checks.

Key words: Geopolitical risks, war in Ukraine, trust, multi linear regression, price variation, COVID-19

Introduction

The ongoing war in Ukraine and heightened geopolitical tensions between Russia and western countries have consequences that go beyond the borders of warring parties. In geopolitical conflicts, the inhabitants become the bearers of the outcome of political games and wars. Russia's war against Ukraine and the sanctions imposed by Western countries have caused immeasurable losses to different people across the world (Chen, et al. 2023). Studies show that geopolitical conflicts can have devastating consequences, such as social welfare loss, rising commodity prices, and inflation (Majeed, et al. 2021) (Dogan, Majeed and Luni 2021) (Cui, et al. 2023). While strategic commodities such as crude oil and gold are highly sensitive to the effect of intensified GPRs, the fact that Russia and Ukraine are two major producers and exporters of commodities such as crude oil, natural gas, wheat, and aluminium, has amplified the effect on commodity prices (Wang, et al. 2022). Soaring prices of these commodities can potentially contaminate other commodities, through substitution effects (Su, et al. 2019) (Bahel, Marrouch and Gaudet 2013) and higher cost of production and biofuel, thereby inducing higher volatility and ultimately intense volatility spillovers in the commodity markets (Wang, et al. 2022). For energy-consuming countries, rising energy prices mean higher production and transportation costs while affecting capital market liquidity through inflation and interest rates, reducing social welfare levels (Chen, et al. 2023) (Antonakakis, et al. 2017).

The catastrophic impact of the Russia's invasion of Ukraine has been felt around the world with global prices skyrocketing, especially for natural gas and oil (Kammer, et al. 2022). This is probably due to the fact that energy, as a strategic substance in the era of the industrial economy, is much more critical than other commodities. Energy security not only affects economic development but also is the

foundation of social security and stability (Chen, et al. 2023). As a consequence, food costs have also soared with wheat which Russia and Ukraine account for 30 percent of global exports, reaching record levels (Kammer, et al. 2022). The rise in commodity prices could have devastating socioeconomic impact. According to World Bank estimates, every one percentage point rise in food prices pushes 10 million people into severe poverty. If food costs remain this high for a year, global poverty might rise by more than 100 million (Bank. 2022).With the war in Ukraine, this number is set to increase. Further, price increases and trade interruptions resulting from the war in Ukraine might increase the number of malnourished individuals by limiting the availability of humanitarian assistance to prevent and cure acute malnutrition (Osendarp, et al. 2022). The World Food Programme (WFP) estimates that acute hunger will grow by an additional 47 million people from a pre-war baseline of 276 million people suffering from acute hunger (Hassen 2022).

There is great body of literature that has analysed the Russia-Ukraine conflict's spillover effects from the perspectives of global food security (Glauben, et al. 2022) and labor migration (Duszczyk and Kaczmarczyk 2022). Despite their limited position in the global economy, with only approximately 2% of global GDP, Russia and Ukraine are considered very important on the international market since they are important producers and exporters of vital agricultural commodities, minerals, fertilizers and energy (Hassen 2022). There is plenty literature on how war has persistent negative consequences on the welfare of the populations involved (Abadie and Gardeazabal 2003) (Koubi 2005) (Gates 2012) (Bluszcz and Valente 2019). Since trust is associated with economic performance, a drop in countries' economic performance could lead to a drop in trust. Studies show that in recent years, trust in government has been on the decline in many countries and link the drop in trust to such major political events as Brexit and the election of Donald Trump to the U.S. presidency (Abrams and Travaglino 2018) (Dyck, Pearson-Merkowitz and Coates 2018). However, there is a lack of empirical evidence on the effects of war on price variation in countries that are not directly involved in wars and at the same time on the impact of GPRs on citizen trust. This article seeks to fill this research gap by examining the impact of GPRs on these variables in France. Besides economic effects, war has social and psychological effects. Yet the impacts of the war on society, people's confidence and economy are still being understood (Pereira, et al. 2022), which justifies this study into effects of GPRs on price variation and levels of political trust.

Using INSEE data, we investigate to what extent Russia's war in Ukraine has affected the increase in prices and on citizen trust in the government in France. The study leverages dataset after the 2007-2008 economic crisis and conducts a time series analysis into the relationship between war, trust and price variation and the relationship among these variables. I control for COVID-19 effects and the growth of GDP per capita.

The remaining part of the article is as follows. The first section determines the socio-economic effects of GPRs. It will allow us to construct hypotheses on war, the rise in prices, spillover effects and political trust. The second section explains the method used and how data were collected. The third section gives the details of results and their analysis. The final section offers concluding remarks and a discussion and some avenues for future research.

Determining how GPRs affect prices and citizen trust

GPRs Spillover effects

Literature in International Relations and theories of war already show that war produces drastic and far-reaching political, economic and military consequences not measurable by battlefield casualties (Grieves 1977). Global economic growth was originally forecasted at 4.4% in January 2022 but declined to 3.2% in mid-year, primarily because of the invasion of Russia in Ukraine and its effects (Yagi and Managi 2023). Commodity markets have experienced the first global economic effects. The prices of goods exported by Russia and Ukraine, such as energy, wheat, fertilizers, and some metals, have increased dramatically (Saâdaoui, Jabeur and Goodell 2022). Earlier research have analyzed challenges of the war pertaining to Ukraine and Russia (Guenette, Kenworthy and Wheeler 2022) but it is very rare to find research on the effects of the war outside warring countries. At the same time geopolitical risks have become increasingly common in recent years and are key drivers of commodity prices (Saâdaoui, Jabeur and Goodell 2022). GPRs can be defined as the exposure of one or more countries to political activity in other countries (Engle and Campos-Martins 2020). GPRs are "risks associated with wars, terrorist acts, and tensions between states that affect the normal and peaceful course of international relations." (Caldara and Iacoviello. 2022). High profile military conflicts that involve different and powerful nations are a prime example of GPRs. Military conflicts are known to have a significant impact on the regional and global economy, ranging from economic, trade and monetary devastation, to loss of production and labor capacity, resources and livelihoods in warring countries and beyond (Khudaykulova and Yuanqiong 2022), (Hang, et al. 2021). Military conflict between countries is often accompanied by the imposition of partial or total trade embargoes on the exchange of goods. This is exactly what happened with the Ukraine war where Russia was sanctioned by Ukraine allies for having waged war on Ukraine. Russia also reiterated with counter sanctions. These conflicts and ensuing sanctions and counter sanctions are likely to have long term effect. For example, war effects on trade are persistent: even after conflicts end, trade does not resume its prewar level for many years, exacerbating total costs. In addition, these conflicts have a multilateral dimension: unlike the direct costs of war, which largely affect only the belligerents, commercial losses affect neutral parties as well, meaning that wars generate a large negative externality through trade destruction (Glick and Taylor 2010).

The sanctions against Russia and Russia's counter-sanctions have repercussions well beyond countries directly or indirectly involved in war. Imposing sanctions to force Russia to withdraw its military operations in Ukraine was a necessary action. But the sanctions do not have isolated effects on the sanctioned country. Rather, they affect other countries through economic spill-overs as a result of GPR (Ozili 2022). Extant literature show that the war in Ukraine and the intense economic impact on Russia due to the fierce financial sanctions unleashed on it, are menacing the global economy, shaking financial markets and making life more perilous for everyone and causing geopolitical uncertainty (Wiseman 2022) (Tavernier and al. 2022). The GPRs associated with the conflict have led to many spillover effects. For instance, energy sanctions will increase the cost of energy prices in EU member states, leading to higher inflation. This is more so because, as per the data on energy trade between the EU and Russia, the EU's energy consumption is highly dependent on Russian energy imports, especially natural gas (Chen, et al. 2023). (Wang, et al. 2022) examine the spillovers of returns and volatility among 16 commodities belonging to three groups (energy, metals, and agriculturals), relating the spillovers to GPRs. It is not surprising the repercussions of war go far beyond the borders of warring nations. From the above we hypothesize:

H1: GPR resulting from the Ukraine war lead to spillover effects

GPRs and energy prices

Europe was already experiencing painful spikes in consumer energy prices before the invasion whilst commitments to phase out Russian imports have further contributed towards cost-of-living crises and fears over energy affordability (Kuzemko, et al. 2022). Recent studies show that GPR caused by Ukraine-Russia conflict are likely to deteriorate the already fragile situation. War in Ukraine has led to energy and food supply issues (Tavernier and al. 2022). Energy supply will have a profound impact on the world's economy and society, leading to social instability. Energy games will have a negative impact on the world's carbon emission reduction and energy consumption structure transformation (Chen, et al. 2023). With Russia supplying about 19% of the world's natural gas and 11% of its oil, energy prices have skyrocketed alarmingly (UNDP 2022). Since the imposition of EU sanctions on Russia, energy and electricity prices in EU countries have risen. The energy ban imposed by the EU has brought intolerable inflation, especially in EU member states, which are highly dependent on Russian energy (Chen, et al. 2023). Europe is predicted to face difficulties in oil and natural gas consumption because it mostly relies on Russia for the supply (Weizhen 2022). Most European countries still rely heavily on oil and related products from Russia, not only for fuelling automobiles, but also for heating, manufacturing industries, and so on. Russia has been the largest supplier of Crude oil to the EU (Allam, Bibri and Sharpe 2022).

Literature has documented how GPRs and energy are intertwined (Liu, Han and Xu 2021) (Caldara and Iacoviello. 2022). The Ukraine conflict changed the geopolitics of energy, increasing oil and gas prices drastically. Russia is the third largest oil producer, and the price of Brent oil has increased by 25% since the onset of the war (UNDP 2022). Oil and gas prices rose as a result of Russia's invasion of Ukraine in 2022, resulting in increased global gasoline prices (Pisani-Ferry 2022). Recent studies show that the rise in crude oil prices appears to have been caused by the Russia–Ukraine conflict (Yagi and Managi 2023). (Yagi and Managi 2023) goes on to show that following the invasion of Russia in Ukraine and the ensuing embargo of Russian crude oil and gas, energy prices rose by up to 20% in about five months (from February to July). The price increase continued for almost five months, averaging $106.96/B (i.e., ＋15.3% compared to February 24) from February 28 to August 3, 2022. The war has driven up oil prices at the pump, with adverse effects on transportation costs and households' budgets. This trend is likely to continue in the short-term, as the prices of refined petroleum products such as petrol, diesel, aviation fuel, kerosene, and lubricating oil increase. Research show that a number of countries in Africa are particularly vulnerable, especially because of their over-dependence on limited sources and their lack of competitiveness in global markets (UNDP 2022). From the theoretical and empirical findings above, I also expect:

H2: GPRs are likely to lead to increased energy prices

GPRs and general rise in prices

While Russia benefited from the oil, most countries paid a higher price for energy imports which translated to a rise in the local pump price of fuel, a rise in food prices and a general rise in merchandise imports despite income levels remaining unchanged (Ozili 2022). Significant higher energy prices feed into inflation (Liadze, et al. 2022). According to the European Central Bank, half of the recent rise in inflation has been driven by higher energy prices (ECB 2022). High energy prices

affect food inflation via three channels. First, agricultural production and food processing is energy intensive; for instance, crop production relies heavily on fuel for agricultural machinery, so higher energy prices tend to be transmitted quickly to higher production costs. Production and exports have been affected by the war and as a consequence, there will be various negative impacts that might be felt internationally and might worsen, notably, for global food security (Hassen 2022). Second, natural gas is an input in fertiliser production[1]; thus higher gas prices increase fertiliser prices, adding to agricultural input costs (Bodnár and Schuler 2022). Limited access to fertilizers lead to uncertainty of future harvests (Hassen 2022). Third, rising transportation costs affect food prices, also making the replacement of commodities with those from more distant sources more costly (Bodnár and Schuler 2022). During wars, military actions have both short- and long-term consequences on the country's ability to transport agricultural products inside and beyond its borders, especially if port facilities and railroads get destroyed (Hassen 2022). The shutdown of major transportation routes due to armed conflicts or societal unrest makes it challenging to carry (imports/exports) or produce some goods, resulting in a decrease in supply and increase in price (Sohag, et al. 2022). Moreover, the war has prevented farmers from working in their fields, and the conscription and population displacement resulted in labor shortages (Hassen 2022).

Literature on the relationship between price increases and GPRs is scarce and scattered. Prior research almost always studied increase in food prices in association with oil prices (Chen, Kuo and Chen 2010) (Esmaeili and Shokoohi 2011). Russia and Ukraine have an important role on the global economy. Russia and Ukraine are significant players in the export of oil, natural gas, coal, wheat, and other commodities in the global market (Wiseman 2022). (Ozili 2022) demonstrates that the rise in the world food price index after the invasion was driven by a significant increase in the price of dairy and oils. The global economic consequence of the invasion was a global supply chain disruption. The disruption in global supply chain manifested through rising prices including rising energy prices and commodity prices and a rise in food prices, thereby leading to a rise in global inflation (Ozili 2022). The inflation seems to move at the highest pace since the 1979–80 oil crisis and the Cold War (Yagi and Managi 2023). Prior studies prove that war and inflation tend to occur together (Benjamin and Kochin 1984). Studies predict that higher prices for commodities such as food and energy will continue to drive up inflation which in turn will reduce the value of incomes and weigh on demand. This lower business confidence and greater investor uncertainty which in turn will weigh on asset prices, tightening financial conditions and potentially leading to capital outflows from emerging markets (Kammer, et al. 2022), (Bachmann 2022). In the aftermath of the pandemic, countermeasures were taken by countries who adopted aggressive policies to curb effects of the inflation. The Ukraine war took place during a period of recovery following the devastating effects of the COVID-19 pandemic and seems to have worsened the already fragile situation.

The rise in food prices may not only be driven by oil price rise. The conflict has disrupted agricultural investment and affected global agricultural markets, increasing the inflation of food products (Allam, Bibri and Sharpe 2022). The war resulted in immediate and far-reaching cascading consequences on global food security: Ukrainian exports have stopped, conscription and population displacement have caused labour shortages, access to fertilizers is restricted, and future harvests are uncertain (Hassen 2022). Different parts of the world have been hurt by war-related supply disruptions and commodity price increases. Higher commodity prices exacerbate the already high inflationary pressures around

[1] The war has led to a 21% increase in the price of fertilizers. Russia is a major source of the ingredients used to produce fertilizers, accounting for 24% of world exports of ammonia and 40% of world exports of ammonium nitrate. Higher global prices of fertilizer would reduce agricultural productivity in some countries, putting further pressure on food supply. (UNDP 2022)

the world (Prohorovs 2022). Rising food prices, notably cereal (wheat and maize) in source markets will negatively affect domestic prices in different countries (UNDP 2022). (Ozili 2022) studied the inflation in Russia and countries involved indirectly in the war and inflation in the rest of the countries. These other countries do not want to impose sanctions on Russia because they do not want to be involved directly or indirectly in the conflict between Ukraine and Russia. He finds that there is a high correlation between the month on month inflation rate in Russia and the month on month inflation rate in the countries indirectly involved in the war in Ukraine. There is evidence that the increase in monthly inflation in Russia was followed by increase in monthly inflation in Ukraine, the Euro Area countries and in countries that imposed the most sanctions on Russia. He finds the same high correlation between the month on month inflation rate in Ukraine and the month on month inflation rate in the same countries (Ozili 2022). Month on month inflation rate is larger in Russia, followed by Ukraine and the Euro Area countries. Meanwhile, the countries that imposed sanctions on Russia (e.g., US, UK, Canada and Japan) also witnessed a rise in month on month inflation rate but at a lesser rate compared to Ukraine and Russia (Ozili 2022). The rise in inflation led to higher cost of living in the affected countries. In the UK, for instance, the monthly inflation rate reached a high of 2.5% in April 2022 – the highest rate in more than 20 years (Ozili 2022). There is a risk that persistently high commodity prices, which are likely to continue until the end of 2024, will lead to stagflation—sluggish economic activity combined with strong pressure on the cost of living (Prohorovs 2022). Following the above, we hypothesize that:

H3: GPRs lead to heightened food inflation and general price rises in commodities

GPRs and political trust

Trust is an integral part of one's personality (Uslaner 2002). It is developed through early childhood socialization and tends to change only slowly thereafter (Conzo and Salustri 2019). People trust governments which show a capacity to generate economic growth, create jobs, provide access to social services and perform in a transparent manner (Mackuen, Erikson and Stimson 1992). However, various economic, political and socio-economic factors can impact the capacity of governments to function properly and in the process could also affect people's political trust (Catterberg and Moreno 2006) (Zerfu, Zikhali and Kabenga 2008). GPRs like the 2008 economic crisis are believed to have affected political trust. Several studies have examined the decrease of trust in government in the aftermath of the 2008 global financial crisis (Earle 2009) (Van Erkel and Van Der Meer 2016) (Armingeon and Ceka 2013).

Like other GPRs, wars create political uncertainty and heightened tension, which in turn creates economic uncertainty and may depress citizen economic evaluations. War making may also distract incumbents from economic management and produce concerns about the future economy in the minds of citizens (Norpoth 1966). Such distraction from economic and political management resulting from wars may directly or indirectly play on political trust. (De Boef and Kellstedt 2004) showed that the Gulf war exhibited a positive effect on economic approval ratings on the US government at the time. However, the approval was just a large short-term effect. War effect on trust may depend on whether one is exposed to war or not and to what extent. Recent research has shown that there is a negative impact of early exposure to war on trust in the adulthood, both at the intensive and extensive margin. This estimated effect of war is robust when controlling for current and childhood socioeconomic conditions, and for other hardships including hunger, dispossession and absence of parents (Conzo and Salustri 2019) (Kijewski and Freitag 2018). These results suggest that those who were not directly exposed to war exhibit higher trust than those who were directly exposed to war. Individuals living in

areas strongly hit by war are less trusting than individuals living in the areas that saw little or no fighting, irrespective of their personal war-related experiences (Kijewski and Freitag 2018). This exposure to war is so powerful that, for instance, it affects refugees trust in institutions and government of countries that they flee to or settle into (Hall and Werner 2022). This is surprising since it is believed that Trust is particularly important in light of immigrants arriving in a foreign culture, because cooperation is often more pronounced within groups than between groups (El-Bialy, et al. 2022).

The growing literature on trust in International Relations show that trust among countries and institutions is likely to be affected by the wars and geopolitical crisis (Natorski and Pomorska 2016) (Kydd 2005) (Booth and Wheeler 2008). The obvious involvement of Russia in the Ukrainian conflict has rapidly eroded the EU's trust in Russia and raised questions as to whether Russia can still be regarded as a reliable partner for the EU and if the EU should decrease its economic dependence on the Russian Federation (Mbah and Wasum 2022). There are little to no studies that show that wars affect political trust in countries that are not directly involved in wars taking into account spill over effects in those countries not involved in war. Amidst the sea of spillover effects, if there is doubt that the authorities are capable of managing the national economy and respond to the challenges of an economic crisis resulting from GPRs, it may create mistrust (Kroknes, et al. 2015). (Foster and Frieden 2017) show that individuals in countries more seriously affected by recession show a greater drop in trust than individuals in countries experiencing better macro-economic conditions. Therefore, I hypothesize:

H4: GPRs affect political trust even in countries not directly involved in wars

Methodology and Data

Dependent variables

The dependent variables are price and trust. Analyses are based on data provided by INSEE. I use data prices beginning immediately after the global financial crisis in 2007-2008 until April 2023. This allows to isolate the effect of the War in Ukraine and the probable interference of the financial crisis on the results. I have month to month prices of major commodities in France including gas (gasoil), food and tropical beverages (foodbev), industrial materials (industry), agricultural raw materials (agriculture), Brent crude oil (brent), unleaded gasoline (unleadgas), and minerals and metals prices (minmet). I also use prices for Brent crude oil, naphtha, unleaded gasoline, gas oil and heavy fuel oil. For all the prices I use the Euro as value. Similarly, for trust I use INSEE datasets for the same period of time. INSEE does not provide details on how neither prices nor consumer trust have been measured.

Independent and control variables

The Russia-Ukraine war was used to operationalize GPRs. To measure war in Ukraine I created a dummy variable coded as 0 indicating the absence of war whereas the presence of war was coded as 1 following (Wasserman 1992) (Altfeld and de Mesquita 1979). War is any series of events that meets the following three criteria: (1) Size: it results in at least 1000 battle deaths (not counting, therefore, the indirect victims through famine, lack of shelter, and disease). (2) Preparation: it has been prepared in advance , and/or is being maintained, by large-scale social organizations through such means as the recruitment, training and deployment of troops the acquisition, storage and distribution of arms and

ammunition, the making of specific war plans and the like, and (3) Legitimation: it is being legitimized by an established governmental or quasi-governmental organization, so that large-scale killing is viewed not as a crime but as a duty (Deutsch and Senghaas, The steps to war: a survey of system levels, decision stages and research results 1973), (Singer and Small 1972). This leads to defining war as actual large-scale organized violence, prepared and maintained by the compulsion and legitimacy claims of a State and its government, and directed against another State or quasi-State, i.e., a relatively comparable political organization (Deutsch and Senghaas, A framework for a theory of war and peace 1971). I also included GDP and COVID-19 as control variables. Civil war scholars like (Fearon and Laitin 2003) (Barbieri and Reuveny 2005) and others have also used GDP as a control variable (Liao, et al. 2022). The data allows me to conduct multi linear regression analysis. Table 1 presents the used explanatory variables and descriptive statistics.

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. dev.	Min	Max
covid19	165	.2363636	.4261414	0	1
brent	165	63.4903	18.85955	16.9	115.5
unlgas	165	.4663636	.1383178	.14	1.02
gasoil	165	565.6473	183.9789	233.5	1226.9
foodbev	165	124.2061	25.70585	79.9	206.8
industry	165	100.0042	22.37814	62.5	175.1
minmet	165	96.71879	22.69461	59	169.3
war	165	.0848485	.2795044	0	1
gdp	165	1.041818	3.066063	-7.9	6.8
trust	165	92.72121	7.003995	79	108

All variables are directly implemented from INSEE calculation except COVID-19 and war. Apart from trust the other variables indicate prices of products (e.g. the prices of Brent crude oil, unleaded gasoline, gasoil, industry items, mineral and metal items, etc.).

Analysis and Results

We expect war in Ukraine to have a strong relationship with the increase of prices of different commodities in France as shown in Table 2. This relationship is positive in all cases meaning that war in Ukraine has exerted pressure on commodity prices in France since the war started in February 2024 until the first quarter of 2023, the period for which we have data and taking into consideration that the war is still ongoing. The price of food and beverage was the one hardly affected by the conflict, followed by the price of gasoil.

Table 2. Correlation matrix

	covid19	brent	unlgas	gasoil	foodbev	industry	minmet	war	gdp	trust
covid19	1.0000									
brent	0.0433	1.0000								
unlgas	0.1967	0.9494	1.0000							
gasoil	0.1566	0.9537	0.9688	1.0000						
foodbev	0.6650	0.3741	0.5843	0.5538	1.0000					
industry	0.7249	0.5090	0.5960	0.5496	0.7088	1.0000				
minmet	0.7034	0.5340	0.6018	0.5608	0.6565	0.9934	1.0000			
war	0.5473	0.4747	0.6405	0.6714	0.8246	0.6046	0.5857	1.0000		
gdp	-0.1103	0.3289	0.3772	0.3034	0.3005	0.3667	0.3342	0.0926	1.0000	
trust	-0.0166	-0.6410	-0.5673	-0.6148	-0.0986	-0.1679	-0.2171	-0.3616	0.0639	1.0000

Note: This correlation matrix is based on 164 observations Agriculturals, industrials and other dependent variables stand for prices of these products on a monthly basis.

The multilinear regression in table 3 and table 4 describe that special relationship between our variable of interest, the GPR –operationalized by war-, with gasoil and the price of food and beverage. The relationship between the war in Ukraine and the price of food and beverage is statistically significant as is the relationship between war and prices of gasoil. While the relationship with food and beverage price is strong, the relation with prices of gasoil is moderate. War exerts similar moderate influence on prices of other commodities included in the study.

Table 3. Multilinear Regression on the relationship between war and gas oil prices

Source	SS	df	MS	Number of obs	=	165
				F(3, 161)	=	66.44
Model	3070659.8	3	1023553.27	Prob > F	=	0.0000
Residual	2480451.29	161	15406.5298	R-squared	=	0.5532
				Adj R-squared	=	0.5448
Total	5551111.1	164	33848.2384	Root MSE	=	124.12

gasoil	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war	521.3472	42.15218	12.37	0.000	438.1047	604.5896
gdp	12.11748	3.235757	3.74	0.000	5.727477	18.50748
covid19	-109.9185	27.69759	-3.97	0.000	-164.6159	-55.22104
_cons	534.7683	11.75151	45.51	0.000	511.5613	557.9752

Taking into consideration the control variables, the results show that the coefficient for "war" is 521.3472, and it is statistically significant (p-value = 0.000). This indicates that there is a positive and

significant relationship between war and the increase in gasoil prices. Specifically, for each unit increase in the "war" variable, the "gasoil" variable is expected to increase by approximately 521.3472 units, holding other variables constant. The coefficient for the control variable "gdp" is 12.11748, and it is also statistically significant (p-value = 0.000). This suggests that there is a positive and significant relationship between the variable "gdp" and the dependent variable "gasoil." For each unit increase in the GDP, the gasoil price is expected to increase by approximately 12.11748 units, holding other variables constant. Finally, the control variable "COVID19"'s coefficient is -109.9185, and it is statistically significant (p-value = 0.000). This indicates that there is a negative and significant relationship between the variable "covid19" and the dependent variable "gasoil." For each unit increase in the "covid19" variable, the "gasoil" variable is expected to decrease by approximately 109.9185 units, holding other variables constant. Prior studies are in agreement that the war in Ukraine has put pressure on essential products like oil (Khudaykulova and Yuanqiong 2022).

Table 4. Multilinear regression on the relationship between war and food beverage prices

Source	SS	df	MS	Number of obs	=	165
				F(3, 161)	=	250.19
Model	89229.394	3	29743.1313	Prob > F	=	0.0000
Residual	19140.3208	161	118.88398	R-squared	=	0.8234
				Adj R-squared	=	0.8201
Total	108369.715	164	660.790944	Root MSE	=	10.903

foodbev	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war	54.72554	3.702791	14.78	0.000	47.41324	62.03784
gdp	2.40024	.28424	8.44	0.000	1.83892	2.961559
covid19	22.37666	2.433051	9.20	0.000	17.57185	27.18147
_cons	111.773	1.032293	108.28	0.000	109.7345	113.8116

The hypothesis that GPRs are likely to lead to increased energy prices is accepted. Results from table 3 and table 4 confirm the hypothesis that GPRs lead to heightened food inflation and general price rises in commodities. The increase in price normally leads to higher inflation. Similar studies have demonstrated that due to the war in Ukraine the month on month inflation as well as the annual inflation rate rose sharply in sample countries not involved in the war and that prices have been affected (Ozili 2022). Lithuania, Estonia, Latvia and Germany are some of the countries to have known heightened inflation following the invasion (Prohorovs 2022). The t-value measures the strength of the relationship between war and gasoil while taking into account the variability in the data and the sample size. In this case, the t-value of 12 and 14 for the "war" variable in the regression of gasoil price and food and beverage price respectively suggest that the relationship between "war" and "gasoil" is highly significant.

The occurrence of war has a particularly strong impact, as indicated by its higher coefficient and t-value, suggesting that it has a substantial influence on the values of "foodbev" even when controlling for GDP and COVID-19. Prior results have shown that the war in Ukraine caused global prices to skyrocket, especially for natural gas and oil. Food costs have also soared with wheat which Russia and

Ukraine account for 30 percent of global exports, reaching record levels (Kammer, et al. 2022). It was necessary to control for the impact of COVID-19 because it had significantly affected price and inflation even before the war. Annual food price inflation edged up during the first wave of the coronavirus (COVID-19) pandemic owing to supply constraints, but subsequently declined. Food price inflation then accelerated from the fourth quarter of 2021, reaching 3.5% in January 2022 and 7.5% in May 2022 (Bodnár and Schuler 2022). Some studies show that even without the Russian invasion, inflation continued to rise since the COVID-19 pandemic in October 2022 (Yagi and Managi 2023). The Ukraine crisis has heightened the pressure on prices and created a long-lasting shock (Khudaykulova and Yuanqiong 2022), all of which put in jeopardy sustainable development and increase the VUCAbility (volatility, uncertainty, complexity, ambiguity) of the world (Sempiga and Van Liedekerke 2023).

There have not been many studies on how GPRs affect trust. It is believed that in moments of crisis citizen trust is affected. Table 5 describes the relationship between war in Ukraine and trust in France and shows that there is a moderate negative association between both variables. In fact, the correlation matrix in table 2 indicates that the increase in prices of all products negatively affects trust but with only the increase in price of oil products exerting a more significant relationship. The hypothesis that GPRs affect political trust even in countries not directly involved in wars is validated.

Table 5. Multilinear regression on the relationship between war and trust

Source	SS	df	MS	Number of obs	=	165
				F(3, 161)	=	13.25
Model	1592.60148	3	530.86716	Prob > F	=	0.0000
Residual	6452.57428	161	40.0781011	R-squared	=	0.1980
				Adj R-squared	=	0.1830
Total	8045.17576	164	49.0559497	Root MSE	=	6.3307

trust	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war	-13.40876	2.149914	-6.24	0.000	-17.65443	-9.163091
gdp	.3328552	.1650354	2.02	0.045	.006942	.6587684
covid19	4.804617	1.412678	3.40	0.001	2.014849	7.594385
_cons	92.37651	.5993697	154.12	0.000	91.19287	93.56015

This study's findings show that the coefficient for "war" is -13.40876, and it is highly statistically significant (p-value = 0.000). This indicates that there is a strong and negative relationship between the variable "war" and the dependent variable "trust." Holding other variables constant, an increase in the "war" variable is associated with an average decrease of approximately 13.40876 units in the "trust" variable.

Robustness check

One could make a case that the above findings are due to outliers and say that a specific incident or event within France like the strikes against pension reform or another one could have caused an abnormally high increase in food beverage prices and gasoil prices. This outlier may impact the

relationship between war and food beverage prices, and gasoil prices and its exclusion in the analysis can influence the estimated effects. The same can apply to unusual trust scores in the period under consideration. This is why it is necessary to run a robustness check to ensure the validity of the findings. Robust regression techniques help us mitigate the influence of outliers and provide more reliable estimates of the relationship between war and other variables. Although my findings align with many recent findings that have shown that GPRs affect price variation, I conducted a robust check to test the robustness of the study. It's important to note that robust regression is a method used to handle potential violations of assumptions in some other types of regression.

The robust regression results provide estimates that are less affected by outliers and heteroscedasticity. Therefore, the coefficients obtained in the robust regression analysis are more robust and reliable compared to the multi linear regression. The robustness check on gasoil model is described in Appendix I. The robust regression analysis shows that the overall model has a significant F-statistic ($F(3, 161) = 59.83$, p-value = 0.000), indicating that the independent variables collectively have a significant impact on explaining the variance in the dependent variable. The coefficients for all variables are statistically significant, indicating that they have a significant influence on the "gasoil" variable. The regression analysis results show that the overall model has a highly significant F-statistic ($F(3, 161) = 276.93$, p-value = 0.000), indicating that the independent variables collectively have a significant impact on explaining the variance in the dependent variable (Appendix II). The coefficients for all variables are statistically significant, indicating that they have a significant influence on the "foodbev" variable. Finally, the findings for the dependent variable "trust" and the independent variables "war," "gdp," and "covid19" are as follows: the coefficient for the variable of interest, war, is -13.50332, and it is highly statistically significant (p-value = 0.000) (Appendix III). This confirms the initial result that there is a strong and negative relationship between the occurrence of war and the values of the "trust" variable. Holding other variables constant, an increase in the "war" variable is associated with an average decrease of approximately 13.50332 units in the "trust" variable.

The above results lead me to confirm the hypothesis that GPR resulting from the Ukraine war led to spillover effects that have affected France in different ways as shown by price increases and the drop in trust although there may be many other factors within France that may impact on political trust. This finding on spillover effects is in agreement with recent findings that have shown that the Russia's invasion in Ukraine had spillover effects to other countries who were not involved in the war between Russia and Ukraine (Ozili 2022).

Discussion and conclusion

The main ambition of this study was to examine the effect of GPRs as driven by the war in Ukraine on price variation and political trust in France. The implications of these findings are different. Inflationary pressures on food and other commodities and services reduce the buying power of consumers' earnings and add to the load on governmental budgets (Hassen 2022). Increased inflation due to higher global prices of energy, food and raw materials is likely to reduce households' consumption, income and savings. Due to the current inflation, most low-income households are currently in a situation of energy poverty, or have no access to electricity. To reduce their energy costs, millions of poor households rely on firewood and charcoal for cooking and heating (UNDP 2022). The price shock risks increasing poverty and disrupting the production of goods and services worldwide (M. H. Chepeliev 2022), (Kammer, et al. 2022) (Pereira, et al. 2022). There is fear that increased poverty and inequality would not only reduce overall economic activity but could also trigger social tensions and unrest in some countries (UNDP 2022). The French government and policy

makers will be wary of the social consequences of a great loss of people's purchasing power and its repercussion on their wellbeing. This is always reminiscent of the yellow vest movement which was triggered by a hike in fuel prices – a rise in oil prices in October 2018 (Mehleb, Kallis and Zografos 2021). For the past few years, a number of low-income residents in France have complained about significant losses in living standards and rising inequalities in France, expressing financial precariousness and difficulty meeting basic needs (Mehleb, Kallis and Zografos 2021). The impact of the GPR caused by the war in Ukraine are likely to have heightened this anger and suffering.

The study has implications for practice. Due to heightened prices, different aspects may suffer because of higher spending on energy or lack thereof. During global shocks individuals and institutions may revise their priorities (Mestdagh, Sempiga and Van Liedekerke 2023). At the individual level, because people spend on energy, the higher energy cost the less their welfare will be (Moshiri and Martinez 2018). For instance, some people may decide to increase spending on energy to prevent getting cold during winter by reducing the quality of food they eat or vice versa, which could have health consequences in the future. Due to increased oil prices, the war could deprive households of basic amenities such as electricity and cooking fuel, and thus increase multidimensional poverty in different parts of the world (UNDP 2022). Reduced access to electricity and cooking fuel would make more households multidimensional poor, while shrinking budgets may trigger households to dispose of their assets, thus reducing their ability to cushion themselves from future shocks (UNDP 2022). The results call policymakers and businesses to be aware of these effects to make informed decisions regarding economic policies, resource allocation, and pricing strategies. In the same line, businesses need to adapt their strategies to mitigate risks associated with price volatility, such as hedging against currency fluctuations or diversifying their supply chains. At the same time, the French government may need to keep implementing effective price stabilization mechanisms, strengthening diplomatic efforts, and ensuring transparent communication with the public to maintain trust in governance. Second, the study reveals a strong relationship between the war in Ukraine and trust in France. This implies that international conflicts can spill over and impact the public's trust in their own government, institutions, and leaders. It highlights the interconnectedness of global events and their potential impact on domestic political dynamics. Policymakers should be attentive to the erosion of trust and take steps to address any concerns or restore public confidence. To reduce the pressure on their citizens, France introduced packages of support for heat pumps. France has limited the increase of final electricity and gas prices (Kuzemko, et al. 2022).

There are two main contributions of this study. At the level of theory, the study confirms the spillover effects of GPRs. It shows that an external conflict (the war in Ukraine) can easily have an impact on domestic economic and political factors. This expands the understanding of how global events can reverberate within a specific country, highlighting the interconnectedness of different regions and their potential effects on local dynamics. By exploring the relationship between war and prices and trust, the study provides insights into how conflicts can influence economic indicators and public sentiment. This contributes to the broader understanding of the social and economic consequences of warfare.

The second contribution of this study is situated at the methodological level. Although previous studies had studied the effects of GPR like the Ukraine war on prices, many used a qualitative method and did not manage to control for the strong effects of COVID-19. By incorporating control variables and using robust regression techniques, the study improves the methodological rigor and provides more reliable estimates of the relationships between war, prices, and trust. This will provide valuable methodological insights for future researchers interested in studying similar relationships. For example, the inclusion of control variables and robust regression techniques can serve as a

methodological guideline for researchers aiming to investigate the impact of other contextual factors on economic and social outcomes.

There are different weaknesses and research implications associated with this study. First of all, establishing a causal relationship between war and price variation or political trust can be challenging. While the quantitative analysis has allowed to disentangle the association between war and price variation on the one hand and trust on the other, it cannot shed light on mechanisms and processes between the variables under investigation. Qualitative methods like process tracing could allow a better understanding of causal mechanisms between GPRs, price variations and trust. By integrating qualitative methods alongside quantitative analysis, researchers can gain a more comprehensive and nuanced understanding of the effects of war on price variation and political trust. Qualitative methods can provide depth, context, and insights that quantitative data alone may not capture, thereby enhancing the overall validity and robustness of the study. Second, the INSEE data I used contains a few product prices. Other studies could check the effect on a more varied number of products or another dataset or even more datasets. Third, the study may not be generalizable to other countries. Replicating the study in different contexts or using different datasets can help validate the findings. If similar causal relationships are observed in different settings or populations, it provides stronger evidence for the causal impact of war. Extending the study to different contexts could also allow for comparability. This would allow us to identify common patterns, distinguish country-specific factors, and gain a broader understanding of the phenomenon.

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Appendix I. Robustness check on the relationship between war and gasoil

Robust regression — Number of obs = 165; F(3, 161) = 59.83; Prob > F = 0.0000

gasoil	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war	526.3166	44.88731	11.73	0.000	437.6728	614.9605
gdp	12.34681	3.445716	3.58	0.000	5.542178	19.15143
covid19	-110.9826	29.49481	-3.76	0.000	-169.2292	-52.73602
_cons	533.6664	12.51403	42.65	0.000	508.9536	558.3792

Appendix II. Robustness check on the relationship between war and prices of food and beverages

Robust regression — Number of obs = 165; F(3, 161) = 276.93; Prob > F = 0.0000

foodbev	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war	55.28284	3.467878	15.94	0.000	48.43445	62.13124
gdp	2.286035	.2662072	8.59	0.000	1.760327	2.811743
covid19	21.18977	2.278693	9.30	0.000	16.68978	25.68975
_cons	113.0786	.9668018	116.96	0.000	111.1693	114.9878

Appendix III. Robustness check on the relationship between war and trust

Robust regression — Number of obs = 165; F(3, 161) = 11.82; Prob > F = 0.0000

trust	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war	-13.50332	2.289838	-5.90	0.000	-18.02531	-8.981332
gdp	.3283098	.1757765	1.87	0.064	-.018815	.6754346
covid19	4.808923	1.50462	3.20	0.002	1.837587	7.780258
_cons	92.2449	.6383788	144.50	0.000	90.98423	93.50558

***Biography:** Olivier Sempiga is a postdoctoral researcher at the Department of Management, Faculty of Business and Economics, University of Antwerp and research group Politics & Public Governance. His research focuses on Foreign aid, democracy, Sustainable Development Goals and trust.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

This article is part of the special research fund grant (ID 48160) that Olivier Sempiga received from the University of Antwerp for his research on trust, SDGs and COVID-19