

Economic Consequences in Europe of the Russian-Ukraine 2022 War

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Abstract: This paper discusses the economic consequences of the Russian- Ukraine war and mainly focuses on the economic impact it brings to Europe. On 24 February, Vladimir Putin launched an unproved invasion of Ukraine. The West responded by unleashing a series of sanctions to weaken the power of Putin’s war machine, but Russia responded with retaliatory measures. The war has caused supply chain disruption and hiked energy and food prices. Oil and gas prices both hiked to a record high. The Euro Area experienced an 8.1% inflation rate. The European Central Bank considered hiking interest rates for the first time in more than 11 years as a result of the strong inflation. The war increases volatility in the conventional stock market. Stock prices plunged significantly on the day of the invasion, but the market recovered shortly as the sanctions against Russia were imposed. As the war created enormous economic uncertainty and increased inflation across Europe, governments should devise effective policies to reduce the inflationary pressure and seek alternative energy sources to reduce the dependence on Russian energy exports.

Keywords: Russian-Ukraine war, Sanctions, Energy, Financial Market, Stocks.

1. Introduction

On February 21, President Vladimir Putin ordered troops into Donetsk and Luhansk and announced the two regions independent [1]. A few days later, on February 24, the Russian military launched a full-scale assault on Ukraine, which signals the official start of the war.

The pro-West opinion is that Putin felt threatened by the intention of Ukraine to join NATO and the European Union. The pro-Russian viewpoint is to “demilitarise and de-Nazify Ukraine” and maintain Ukraine’s neutral position [2]. The conflict between standpoints leads to various sanctions being imposed on Russia.

Up until June, the European Union has unleashed six packages of sanctions. The most recent entails an additional SWIFT embargo on three Russian banks and one Belarusian bank, as well as a limitation on the importation of crude oil and processed petroleum products from Russia (with a few limited exceptions). Russia responded to the EU’s action by reducing the transport of natural gas into Europe.

The ultimate economic impacts on the EU and other countries across the globe remain unknown till the termination of the war. From existing evidence, the EU is experiencing rising energy and food prices. The fall in the composite Purchasing Manager’s Index (PMI) of the Euro Area corresponds

with the invasion proceeding. There are also rises in various price indexes during the proceeding invasion.

This paper primarily focuses on the economic impact of the Russian-Ukraine war and forecasting the future economic consequences of this war on Europe. It also includes an analysis of stock markets in Europe and the US to study how global investors react to this modern war. It will hopefully fill the gaps in the literature about modern wars and add more to the current discussions about the ongoing conflict.

The remaining paper is structured as follows. Section 2 presents Europe's response to the invasion and Russia's retaliatory measures. Section 3 highlights the potential economic impact on Europe and the spillover effects. Section 4 analyses the stock market. Section 5 suggests suggestions to governments and investors to cope with the financial consequences. Section 6 concludes.

2. Europe's Response and Russia's Retaliation

2.1. Sanctions

Many countries condemned Russia and openly supported Ukraine, for instance, the United Kingdom, European Union, the United States, and Canada. They unleashed sanctions to weaken Russia's economic power and starve Putin's war machine. Some sanctions imposed by the EU (including individual members) and the United Kingdom are:

- SWIFT ban for several Russian banks
- Sanctions against certain members of the Russian State Duma who supported the acknowledgment of the un-governed regions of the Donetsk and Luhansk oblasts
- Prohibition on the provision of euro-denominated banknotes to Russia
- Prohibition of imports from Russia of iron and steel, coal and other solid fossil fuels, wood, cement, seafood and liquor, jet fuel, crude oil, and refined petroleum products (with limited exceptions) to the EU [3].
- Closure of EU airspace to all Russian aircraft
- Closure of EU ports to all Russian vessels
- Prohibition of road transport from Russia and Belarus to the EU
- German halted the Nord Stream 2 pipelines
- The United Kingdom imposed financial sanctions, including asset freezes and travel bans on numerous Russian oligarchs and measures to prevent access to capital markets for Russian-owned financial institutions. Prime minister Boris Johnson announced that by the end of 2022, the UK would gradually stop importing Russian oil and oil products.

2.2. Russia's retaliatory response

In retaliation, Russia imposed export restrictions on more than 200 products through the end of 2022, including telecommunication, automobile, agricultural, medical, lumber, and electrical equipment [4]. It stopped paying interest to foreign investors who own Russian government bonds, forbade Russian corporations from paying dividends to foreign stockholders, and barred foreigners from selling Russian stocks and bonds. Lately, Russia has reduced natural gas supplies by half to Italy and Slovakia and cut off France entirely [5]. The International Energy Agency (IEA) said Russia could completely cut off European natural gas supplies.

3. Potential Impact on the European Economy

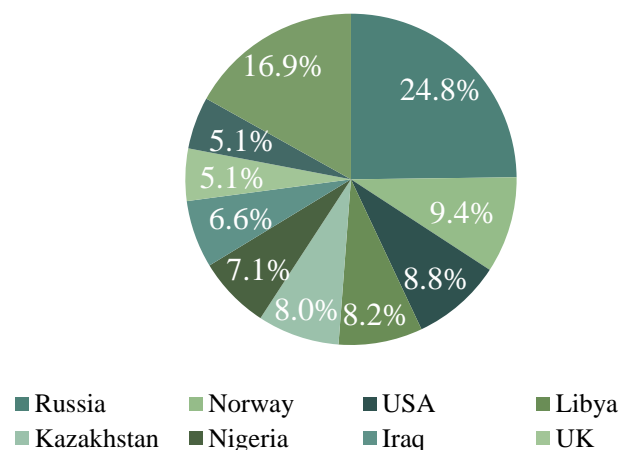
3.1. Supply Chain Disruption

The covid-19 pandemic has disrupted the logistics networks on a global scale due to the stricter border controls and increased custom regulations. Europe merely recovered from the severe economic impact of the pandemic, and companies are reshaping their supply chains. Yet, the Russia-Ukraine war disrupts the supply chain again or could even result in the deterioration of the current situation.

Cross-broader blockades will worsen road transportation, the closure of the EU airspace to Russia will reduce commercial flights, and the closure of the ports has halted 90% of Ukraine's wheat exports. These will lead to stockpiling of supplies and raise prices.

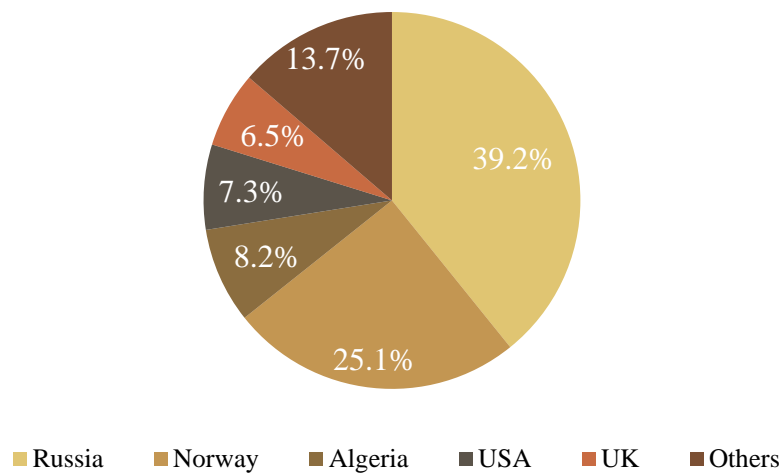
Russia was the third-largest partner for EU imports of products in 2021 (accounting for 7.5% of imports outside the EU and totalling €158 billion). Ukraine was the fourth-largest exporter of agricultural products to the EU. Since the EU relied heavily on importing natural gas, oil, iron, and steel from Russia and agro products from Ukraine, the supply chain disruption could lead to severe consequences, namely energy and food shortages. Furthermore, the shock to supply will increase the price of imported energy and raw materials, which will raise the cost of production for the EU manufacturers since they primarily rely on those imports from Russia in the production process and thus increase the inflationary pressure.

While oil can be shipped by sea or land, the gas shipment mainly depends on pipelines. The lack of gas transportation infrastructure and the lack of diversification for imports (see the comparison of Fig. 1 and Fig. 2 below) leaves the gas supply chain of Europe in a relatively vulnerable position. President Vladimir Putin demanded rouble payment for gas purchases from countries he called "unfriendly," yet many European governments failed to do so. As a result, customers in Poland, Bulgaria, Finland, Denmark, Germany, and the Netherlands have had their yearly gas deliveries from Gazprom cut short by at least 20 billion cubic metres [6]. The rouble gas payment could create difficulty in gas purchases and further disrupts the gas supply chain.



Source: Eurostat database (Comext) and Eurostat estimates

Figure 1: Extra-EU imports of petroleum oil, 2021.



Source: Eurostat database (Comext) and Eurostat estimates

Figure 2: Extra-EU imports of natural gas, 2021.

However, the war is not the only significant challenge to the supply chain in 2022. The zero-covid policy in China brought constant lockdowns, and the recent lockdowns in the Chinese port of Shanghai in April caused cargo delays. Suppose the Chinese government continues its strict domestic covid-19 policy. In that case, frequent lockdowns of seaports and airports will lead to congestion on a global level and reduce the arrival reliability of exports to Europe. Therefore, it can be argued that the war in Ukraine compounds the existing uncertainty in supply chains; according to Accenture Report (2022), supply chain disruptions due to covid-pandemic and Russia-Ukraine war could result in an estimated €920 billion loss of GDP across the Eurozone by 2023 [7].

3.2. Hike in Energy Prices

Before Russia's invasion, the Brent crude oil was at \$86.51 per barrel in January 2022 and \$97.13 per barrel in February; on the day of the attack, the Brent crude went above \$100 per barrel (101.29 USD/BBL). At one point, the oil price skyrocketed to \$139.13 per barrel. The war stimulated and dominated the oil price, breaking the highest price since the 2008 Financial Crisis. It is estimated that the war could cause the oil price to hike to \$140 per barrel [8]. However, the oil price has slightly fallen in June, possibly due to the agreement of OPEC to pump up more oil as Russian output starts to decline as a result of Western sanctions, on June 30 the Brent Oil Spot Price was \$119.78 per barrel [9]. Despite the fall after rising, the overall upward trend of price change during February and June indicates the severe impact of the war on the European oil market.

Russia has long maintained a share of between 28 and 30 percent in the European oil market, which makes Russia and Europe's energy needs inextricably linked; 62% of the EU's imports from Russia were for energy. [10]. Additionally, it renders Russian crude oil exports, which go to Europe over 60% of all exports, very dependent on the European market. So if Russia's crude oil exports to Europe are heavily cut off, active or passive - either by the already imposed EU's partial embargo on Russia's crude oil and petroleum products or the retaliatory export ban from Russia, the energy crisis in Europe is not groundless. But it will also trigger tremendous changes in the global crude oil supply and demand landscape.

Before the break of the war, Russia had sharply reduced short-term gas sales to the Europe market, which pushed up prices. Due to low inventory levels at the beginning of the heating season, gas storage levels decreased to 30% of their functional storage capacity; following Russia's invasion of Ukraine, gas prices in Europe increased by 50% daily on February 24, 2022, reaching USD 44/MMBtu [11]. The war has exacerbated tightness in the gas market, creating uncertainty, especially for the European gas market - Russian gas deliveries to the EU accounted for 36.5% of all gas imports (excluding intra-EU trade) in 2021 [12].

The change in TTF Gas price presents a similar trend to the shift in Brent Oil price. The TTF Gas price reached its highest on 7 March, then gradually fell. The global economic slowdown and recession can explain this pattern; the lowering business and consumer confidence levels would reduce both manufacturer and household demand for energy. Even though the oil and gas prices have retreated, the energy price is still much higher compared to 2021. The energy supply in European countries is dependent on natural gas, oil, and petroleum products; the hike in energy prices can be one of the main contributors to the 8.1% inflation rate estimates in May in the Eurozone. In order to curb the high inflation rate, the European Central Bank planned to raise the interest rate for the first time in 11 years; if successful, it can be expected that energy prices could fall.

3.3. Rise in Food Prices

Russia and Ukraine are major exporters of food, and Ukraine is known as the breadbasket of Europe. According to Food and Agricultural Organisation (FAO), Russia and Ukraine were among the world's top three exporters of wheat, barley, maize, rapeseed and rapeseed oil, sunflower seed, and sunflower oil in 2021. Additionally, Russia was the second-largest exporter of potassic fertilisers, the third-largest exporter of phosphorous fertilisers, and the world's top exporter of nitrogen fertilisers.

In Ukraine, the fighting has damaged transport facilities and suspended shipping operations; the war also disrupted the planting for the next quarter. The rise in insurance premiums in wartime for ships entering the Black Sea region ports has increased the already high cost of sea transportation. The reduction in supply and transportation costs contributed to the rise in food imports.

Due to the rising input costs-fertilisers and energy imported from Russia, European farmers will face lower yields and greater production costs; the higher cost needs to be compensated by higher prices. And retailers have to pass the higher food producer prices onto higher food retail prices, leading to food inflation in Europe. According to Eurostat (2022), the cost of food in the Euro Area increased by 8.70%, and the cost of food in the EU increased by 10.01% in May. The profitability of European food retailers will be put under pressure of high inflation combined with the post-pandemic fall in the food sales in shops; thus, high pass-throughs to consumer prices are foreseeable [13].

The EU does not rely heavily on imported food; its trade surplus of agricultural products in 2021 was €47 billion, meaning it is a net exporter. But the reduction in food supply from Russia and Ukraine and the EU sanctions did cause the consumers to lose cheap food imports and forced to substitute them with the higher priced domestically produced food.

3.4. Record High Inflation

In 2021, according to Harmonised Index of Consumer Prices (HICPP), energy accounted for 9.5% of the total consumption of households in the Euro Area (electricity, gas, solid fuels, and heat energy accounted for 5.29%); food, including alcohol and tobacco, accounted for 21.76% of the consumer basket. Given the relatively substantial impact, it suggests that those consumption proportions are susceptible to price rises.

The Consumer Price Index (CPI) of the Euro Area was 117 in June, an increase of 0.801% from the last month and 4.707% from February. Though the CPI shows a continuously increasing trend

from 2021 due to the impact of the covid-19 pandemic, the outbreak of the war exacerbated the rise with a most robust hit driven by the sharp increase in energy and food inflation (see Figure 3 below).



Figure 3: Euro Area Consumer Price Index (CPI).

The Euro Area is a net energy importer; the surge in energy prices means inflation will essentially be imported. From 8.1% in May, the annual inflation rate in the Euro Area jumped to a new record high of 8.6% in June. - so the real income will fall considerably. Consumers will suffer from the rise in daily commodity prices and the higher utility expenses - the cost of living will increase substantially while purchasing power will be reduced. The low-income household will be most affected because they spend a larger proportion of their income on energy and food. The inflation will lead to the exports being relatively more expensive, causing a spillover effect on developing countries, especially African countries, as they primarily rely on importing manufactured goods from the EU so that they will import the inflation in Euro Area into their domestic economy.

3.5. Economic Growth Outlook

Despite the dim forecast of the Euro Area economic growth outlook due to the war in Ukraine, the GDP of the Euro Area expanded by 0.6% in the first quarter of 2022 from the previous quarter, greater than the estimated 0.3% growth [14]. However, the Russia-Ukraine crisis is still raging and continues to interrupt supply chains and exert upward pressure on commodity processes, creating huge uncertainty. The Euro Area may be threatened by stagflation. Supply shortages and soaring fossil fuel prices will increase production costs, causing short-run aggregate supply to decrease and negatively affecting real GDP. As a result, the economic outlook for the Euro Area needs to remain questionable.

The proceeding war may create new interruptions to the already disrupted supply chains. Moreover, if major cities in China experience another round of lockdowns, logistic difficulties will be elevated. The uncertainty in shipments makes the commodity prices even more volatile. It will hurt the manufacturing sector in the Euro Area as it depends on critical commodities imported from Russia and Ukraine.

The higher-than-expected inflation rate will have a negative effect on consumer and business confidence. Households may reduce consumption because purchasing power declines, and they may prefer to save rather than spend, fearing the economic situation will worsen. Producers may reduce output as sales are diminished, and profitability decreases due to the rise in input costs.

4. Global Financial Market Reaction

The Russian-Ukraine war is affecting the global stock market. Though the war may benefit defence stocks, it contributes to volatility in the conventional stock markets. Stock prices in the Russian

market slumped as investors fled for safety, and stock prices in the US and across Europe fluctuated furiously.

On 24 February, the MOEX Russia index fell by more than 24%, and the RTS index plunged by more than 30%, reaching a 23-month low. After losing more than 800 points during intraday trading, the Dow Jones Industrial Average (DJI) closed in the green, while the S&P 500 recovered from a 1.5 percent decline to close 1.5 percent higher at 4,288.69 [15]. The Stoxx Europe 600 and the FTSE 100 index both fell more than 3%.

Shortly, the stock market rebounded as sanctions on Russia were announced. The FTSE 100 index increased by 3.9 percent the day following the invasion, while the Dow Jones Industrial Average closed 2.5 percent higher and the S&P 500 increased by 2.2 percent [16].

The gold price rose sharply on the day of the invasion as gold is a major safe haven-sudden event that often causes the price of gold to soar in the short term. The uncertainty of the Russian-Ukraine war and higher global inflation will boost the demand for gold futures as a safe haven. However, demand for the metal may be weakened due to rising interest rates to reduce inflationary pressure because there will be a higher opportunity cost of hoarding non-yielding bullion.

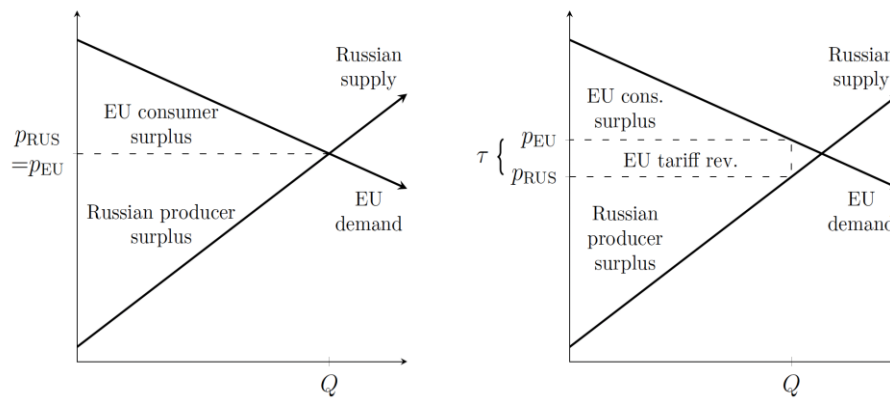
5. Suggestions to European Policymakers

5.1. Policies Towards Russian Energy Imports

According to estimations by the International Energy Agency (IEA), the federal budget of Russia was funded by roughly half of its oil and gas export earnings in 2021. An embargo can significantly reduce the revenue stream for Russia to fund its war machine, thus, being a possible option to catalyse the war's end. A complete energy embargo on Russia, however, is impractical because it may plunge the economy into a recession given the EU's reliance on Russian energy imports, which accounted for almost 40% of its total gas consumption, 27% of its oil imports, and 46% of its coal imports in 2021 [17].

Using a two-country model, a demand-and-supply analysis can illustrate the effect of a tariff. In research from Sturm and Menzel (2022), when assuming the EU demand for Russian energy is perfectly price inelastic, the higher price will not affect the Russian producer surplus but only reduce the EU consumer surplus [18, 19]. As long as the EU government redistributes the tariff revenue to the consumers, their welfare will not be affected. In this case, a tariff is ineffective but harmless for the European economy, while a full embargo may be effective but will hurt Europe definitely.

When the EU demand is not perfectly price inelastic (see Figure 4 below), the tariff will reduce the price received by Russian producers and increase the price paid by EU consumers (the same as an indirect tax analysis). Therefore, the producer surplus will be reduced, and the quantity demanded also decreases, making the Russian economy worse off. The EU government can redistribute the tariff revenue at the same time to make up for the consumer welfare loss, for as by making transfer payments to low-income households that spend a higher percentage of their income on energy.



Source: VOX, CEPR Policy Portal

Figure 4: Demand-and-supply curve of EU-Russian energy market under zero tariff (left) and a small tariff (right).

Russia is now India's second-biggest oil supplier after Saudi Arabia, with China's crude oil imports from Russia increasing to 55% in May and displacing Saudi Arabia as the main supplier [20]. Nevertheless, these two countries cannot absorb all of Russia's European export volume in the short-run. Especially in China, as the government is determined to stick to its zero-covid policy, frequent and massive lockdowns indirectly cause 1/3 of the Chinese oil refining capacity to be idle. Thus, a full embargo on Russia's oil export by the EU may hurt the Russian economy in the short term because losing the European market is detrimental to Russia's oil export sector, which offers the country the primary export revenue stream. However, in the short-run, namely in 2022, it is difficult for Europe to diversify its oil supplier and supply routes fully, so the embargo will more or less hurt the EU economy.

Due to its inferior quality in comparison to Brent oil, Urals oil is typically offered at a discount of USD\$2-3 per barrel. With the already imposed partial embargo by the EU and other Western countries, the price difference dramatically rose in March from the end of February; on July 11, the price of Urals crude oil was recorded at USD\$32.35 per barrel less than the benchmark Brent [21]. Approximately 35% of Russian crude oil exports to Europe are transported via the Druzhba pipeline, and the rest are seaborne. In contrast, the Eastern Siberia-Pacific Ocean Oil Pipeline delivers most Russian oil exports to China. The infrastructure bottlenecks may prevent substantial redirection of oil exports to Asia as high additional transport costs could be incurred. Altogether, these indicate that Russia's oil supply's price elasticity is lower than the price elasticity of the EU's demand. Therefore, a tariff on Russian oil could be the most effective policy because it will ensure Russia pays the majority of tariff revenue rather than the EU consumers while bringing extra tax revenue for the government.

On the other hand, Europe is more dependent on Russian gas than Russian oil. Natural gas is essential for heating. Importing more than 40% of gas from Russia in 2021, a full embargo will put the continent into an energy crisis in the upcoming winter when the demand for gas increases significantly. Under this circumstance, a high tariff will also not be a wise solution because it will reduce Russia's gas export revenue with a massive trade-off for the EU households' welfare.

The overall effectiveness of the EU sanctions is based on whether they can successfully reduce the reliance on the Russian energy supply. The European Commission announced a new investment plan called REPowerEU on May 18. It intends to spend 2100 billion euros between now and 2027 in order to completely eliminate the EU's reliance on Russian fossil fuels. Including this money, the EU hopes to spend 720 billion euros and grant 225 billion euros in loans from now until 2030 to help member

states to improve fuel efficiency, accelerate the development of renewable energy and then achieve the EU's goal of tackling climate change.

5.2. Policies Towards Increasing Inflation

The EU planned to use monetary policy to reduce inflation as the ECB has raised its key interest rate by 0.5 percentage points in July to 0.0% and prepares for further increase [22]. A higher interest rate can reduce inflation by decreasing consumption and investment and suppressing the euro's depreciation. However, lower aggregate demand will reduce the real GDP, so slower economic growth in the next quarter. The current inflation problem faced by Europe is not caused by excessive consumption but by supply shortages, especially energy and hiking input prices reducing aggregate demand would be ineffective and cannot solve the problem fundamentally.

One option is through strategic energy reserves to increase the energy supply. The European Parliament has set a minimum gas level in storage facilities at 80% by November 2022 to secure the gas supply before winter. However, this is only a short-term remedy and may have little effect because when the reserves run out, energy prices will increase again. In the long term, governments may have to make new contracts with other energy-supplying countries to increase import volumes.

To protect consumers from increasing commodity prices, one approach is to set maximum prices. For example, France has set energy price caps, which will be extended until the end of 2022. Yet this approach is not suitable in the current context because maximum prices will lead to further shortages. Another method is to use transfer payments to help low-income households, and the transfer payments can be made specific. Governments may limit transfers to those with income below a certain level by adjusting them based on a recent electricity bill and family income data, respectively [23].

A supply-side policy could be a more effective solution. Recently there have been many strikes across Europe due to the increasing cost of living and reducing real income. Incentives such as lower income tax, wage subsidies, and better training schemes must be provided to help the workers recover from the pandemic and assist them through the war's economic blow to enable workplace efficiency. Also, better infrastructure must be built to overcome the energy transportation bottleneck and reduce transportation costs.

6. Conclusion

Unlike other wars in human history, the Russian-Ukraine war is unique as it occurred in a pandemic year. It brought unprecedented economic consequences to Europe and the whole world as all the impacts that a conventional war will bring to economies are accompanied by the remaining influence of the covid-19 pandemic.

The most noticeable impact of the war was supply chain disruption, which exacerbated the logistic problems during the pandemic. It caused supply shortages in energy and food and raised commodity prices. Gas supply is affected chiefly because transportation mainly relies on pipelines connecting Russia and Europe.

The Russia-Europe energy interdependence has caused a dilemma for policymakers. Sanctions against Russia's energy export will hurt its economy but also could plunge the Euro Area into an energy crisis this winter and a recession. For oil, a full embargo can work in the short run as it is impossible for Russia to redirect all the Europe export volumes to Asian countries. For gas, a full embargo is not sensible as Europe still heavily relies on Russian gas and cannot fully diversify gas suppliers by the end of 2022. Therefore, a tariff could be a better solution for both oil and gas because as long as the elasticity of supply is less than the elasticity of demand, Russian energy suppliers will pay more proportion to the tariff revenue received by the EU governments.

The rise in energy and food prices led to a continuous increase in the consumer price index throughout the months, and the CPI was at 117 points in June. The inflation rate hit a record high of 8.6% in June, leaving the Euro Area's economic outlook extremely uncertain. The Euro Area is also being exposed to a risk of stagflation because the inflation is supply driven. The ECB planned to follow the traditional way of handling rising inflation: to increase the interest rate. However, using contractionary monetary policy will not eradicate the problem and cause conflicts in macroeconomic objectives; real GDP will decrease while the inflation rate is reduced. Supply-side policies may be a better solution but also hard to display the short-term effect.

The EU governments also face a trade-off between undermining Russia's economic strength and the EU citizens' welfare. To protect consumers, especially those vulnerable groups experiencing a considerable reduction in real incomes, need-oriented transfer payments can be made possible.

The war has been on for nearly five months, and there is little sign of termination. The atmosphere of uncertainty still shrouded the Europe continent. Governments need to devise flexible policies in terms of sanctioning Russia and protecting the domestic economy from a recession. The top priority is to reduce the reliance on Russian energy so Putin will not have such great leverage and bargaining power. The current steps are far too small to save Europe from an energy crisis.

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