

# Opinion Article:

## Global Supply Chain Imputations of Russia–Ukraine War

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### ABSTRACT

The supply chain is a network of interconnected organizations or organizational entities developed with the goal to deliver the right product to the right place at the right time and in the right quantity. The global supply chain is subjected to higher magnitudes of risk factors than their localized counterparts. They are the backbone of international trade. Global chains have been reeling under the effects of the COVID-19 pandemic since 2020 while they are hit by Russia–Ukraine war, which has disrupted international trade and subsequently supply chains. The purpose of this paper is to identify the scale and effects of this war on global supply chains and their disruptions.

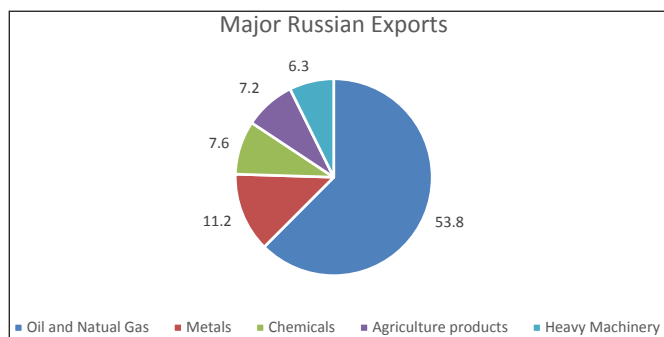
**Keywords:** Supply Chain Disruption, Sanctions, Logistics Network, Supply Lines, Blockade, Global Supply Chains

### INTRODUCTION

Russian Federation launched its special military operation in Ukraine on 24<sup>th</sup> February 2022 ending months of uncertainty over its troop build-up at the border. The subsequent sanctions on Russian exports, banks and individuals by the United States, European Union, and G7 have added to the woes of already stressed global supply chain network. Russia exports oil, natural gas, metals, diamonds, coal, chemicals, agriculture products, fertilizers, and heavy machinery. Some of these export products are the raw materials for many industries worldwide. Russian imports include vehicles, pharmaceutical products, computers, commodities, plastics, iron, and steel. Sanctions on the Russian economy have crippled the supply chains of these products and commodities.

Meanwhile, Ukraine is often called the “breadbasket of Europe”. Wheat from Ukraine feeds European Union, Egypt, China, Turkey as well as Africa. Ukraine ranks first in sunflower oil exports with India one of the major markets. Other major Ukrainian exports include electrical, electronic equipment, iron and steel and machinery. With the war continuing, supply chains in Ukraine have been brought to a standstill. The conflict led to a sharp surge in crude oil prices where Brent Crude rose from \$91 per barrel in February to \$130 per barrel in March. This surge in crude oil prices has driven up the transportation cost, in turn, significantly affecting supply chain profitability and thus their efficiency. Western brands like Microsoft, Apple, and McDonald’s have exited from Russia, thereby stalling their operations and supply chain in Russia.

This paper provides an assessment of the implications of the Russian military operation in Ukraine on the supply chain practices, the manner in which different sectors of the economy have been hit. The paper is arranged as follows: Section 2 surveys the literature on disruptions to the global supply chains. Then the paper shifts towards the analysis of supply chain disruptions in sectors like metals, chemicals, agricultural products, oil and natural gas, and pharmaceutical products. Section 3 presents the concluding remarks.



**Fig. 1**

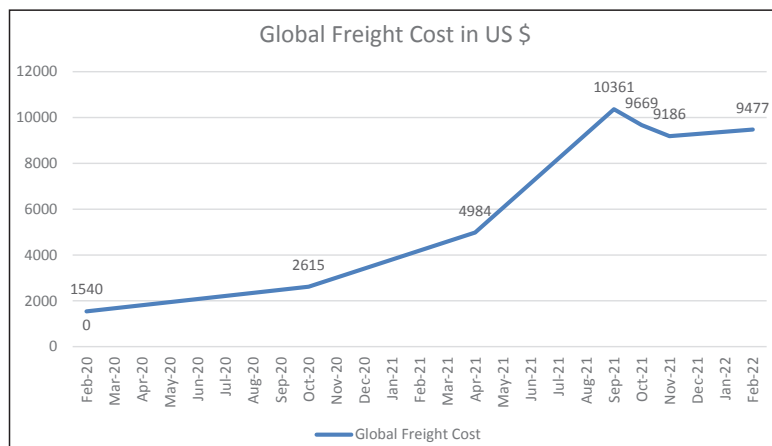
## LITERATURE REVIEW

This section consists of literature on disruption in global supply chains and the analysis of disruption in various sectors of the economy.

*Global Supply Chain Disruption:* As the economies globalize and supply chains expand, there is an ever-increasing threat of supply chain disruptions when a war or calamity breaks out in any part of the world. Global supply chain disruptions are the unanticipated and unplanned events that affect the normal flow of goods, information or funds from one stage to another which are located in different countries worldwide.

*Disruption in the Oil and Gas Sector:* Russia–Ukraine war and the subsequent sanctions on Russian oil and gas exports severely affected the sector’s supply chain. Crude oil prices which were hovering around \$91 per barrel before the war peaked at \$130 per barrel by the second

week of the war all due to a disturbed supply chain of oil from Russia. The sanctions banned shipping companies from providing their tankers for the shipment of oil from Russia. This tripled the shipping rates to \$30,000 per container and eliminated one of the core drivers of the supply chain, i.e. transportation. Global freight charges had already skyrocketed during the COVID-19 pandemic while they surged again when the war began. Ship fuel prices spiked to \$1000 per ton affecting freight cost and therefore supply chain profitability. The high cost of crude oil is driving up inflation in oil-importing countries like India. The high oil prices are affecting supply chains in developing countries where costs of commodities have risen sharply. Industries like rubber, plastics, petroleum products, and their respective supply chains around the world which depend on crude oil supply are witnessing high manufacturing and transportation costs. High and uncertain oil prices are affecting the timely delivery of goods thus affecting a supply chain’s core motive of delivering goods on time and at low cost.

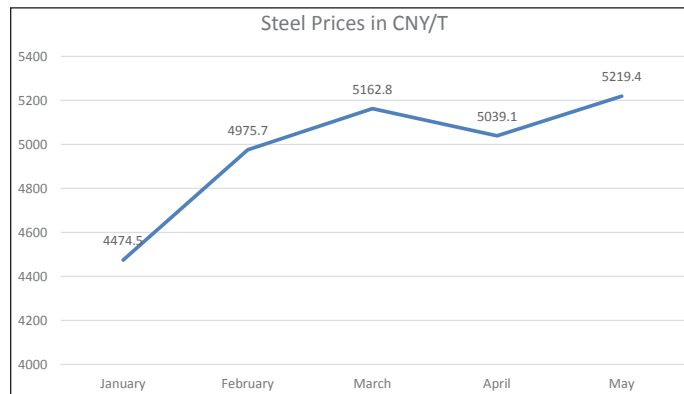


*Disruption in Agriculture Sector:* The war in Ukraine has disrupted the local supply chains causing widespread food shortage in Europe and Africa. Countries like Egypt, Tunisia, Lebanon, and Western European countries have seen a surge in food prices. Couple this with rising energy costs, rising supply chain costs, disruption and decreased profitability, and the magnitude of the problem gets doubled. Ukraine is called the “bread basket of Europe”. Russia and Ukraine together produce 30% of the world’s wheat. Sanctions on Russia have halted the wheat exports from the country while Ukraine’s crippled agriculture industry has halted the supply chains in and from Eastern Europe. Wheat prices jumped about 12%, whereas corn saw a price rise of 14.5% since the war. Sunflower oil price has reached a record due to non-functioning supply chains in Ukraine. Russia is one of the largest exporters of fertilizers. Ammonia, potash, and nitrogen are trading at record high levels since the war. The high cost of agricultural inputs will affect the overall agriculture

supply chain and drive up costs in different parts of the world. Shutting down of food and agriculture-dependent manufacturing units has stressed supply chains with low availability of manufactured food products. Even though this war has halted business in Ukraine, it has proved to be favourable for agriculture supply chains in India. Countries like Egypt, Indonesia, and Qatar have ramped up their wheat and grains procurement from India. Supply chain efficiency in India has made Indian wheat exports cost-effective.

*Disruption in Chemicals and Metal Sector:* Ukraine exports half of the world’s neon gas which is used in the semiconductor industry. With the attack on neon gas plants, the second cycle in a supply chain, i.e. manufacturing cycle has halted. The shortage of neon gas is again intimidating the already stressed semiconductor supply chains by the COVID-19 pandemic. With the sanctions by the west on Russia in place, chemical exports from India

have risen providing a boost to supply chains in India. Ukraine is the 13<sup>th</sup> largest producer of steel. Logistics has been gravely affected due to war. Ukrainian ports in the Black Sea are blocked which has stalled steel and other metal exports. Some plants tried to resume in Ukraine production but were unable to due to downtime of different sectors in a supply chain. Global steel prices have sharply risen in the months of the war. Supply chains of raw materials like coal and iron have been hit in Russia by sanctions.

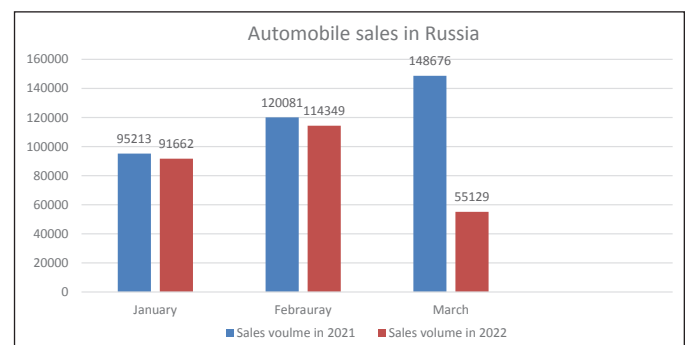


Indian major steel producer Tata Steel has stopped iron and coking coal purchase from Russia. Nickel, a major component in electric vehicle batteries soared around 25% over fears of supply disruptions. Other major metals that saw a surge in prices were Palladium, Aluminium, Pig Iron, and Copper. Disruptions in the metal supply chain directly affect the supply chains of automobiles and heavy machinery.

*Disruptions in Pharmaceutical Sector:* Ukraine and Russia export pharmaceutical products to Uzbekistan, Georgia, Moldova and other Central Asian, and European countries. Sanctions by European Union, G7, and the United States have halted the supply of pharmaceutical equipment and products to Russia. Cost of raw materials has risen sharply due to disturbed supply lines. Shortage of medicines was reported in some parts of Russia. The war stalled supply chains in Eastern Europe which delayed the supply of raw materials to the US pharma industry. The industry's supply chain is also hit by increased transportation cost. Port blockade has ceased logistics operations concerned with medical supply lines. Major Indian pharmaceutical companies like Dr. Reddy's Laboratories, SunPharma, Torrent, and Cipla are witnessing the impact of war on their pharma exports to Russia and Ukraine caused due to disrupted logistics network. Sales to Russia between April and December 2021 by the Indian pharma industry were \$386 million. Indian pharmaceutical industry relies

on raw material imports from Russia. The supply chain disruption will cost the Indian pharma supply chain dearly and this affects the supply of medicines to all the countries due to India being the world's largest exporter of pharmaceutical products.

*Disruption in Automobile Sectors:* This sector saw the closing of assembly units of BMW and Volkswagen in Germany due to a shortage of raw materials like metals, plastics, and tail lights manufactured in Ukraine. Estimated 1 million units of car demand has been lost in Ukraine and Russia combined by the European and American car manufacturers. Car sales in Russia have plunged by 63% due to sanctions and subsequent supply chain closure.



**Fig. 2**

The impact of war and supply chain disruption in Russia and Ukraine is being felt in India where the sale of passenger vehicles fell by 8% in February while the cost of steel and aluminium rose by 15%. The automobile sector is facing a chip shortage driving up the vehicle prices in many countries. Major automakers like Renault, Hyundai, Kia, and Toyota have either closed their business in Russia or have reduced sales as a part of a corporate retreat from the country.

*Disruption in Other Sectors:* Russia-Ukraine war has hit the retail sector supply chain in both countries. Sanctions and subsequent halting of supply lines have resulted in a shortage of some grocery products in Russia. Damage to supply lines and logistics networks in Ukraine are hitting supply lines around the world with stalled exports to the war-torn nation. Inflation is at record high levels in most of the countries since the start of the war. Logistics disruption is affecting the textile sector supply chain in India and Bangladesh. Russia imported \$700 million worth of textile every month from Asian countries. Electronic shipments to and from Russia and Ukraine are being delayed.

## CONCLUSION

Russia and Ukraine combined have an economy of \$1.93 trillion which make them the 8<sup>th</sup> largest economy in the world. Both the nations are the major exporters of energy, food, metals, and pharmaceuticals. These exports are crucial to international trade. But the war has gravely disturbed supply chains not only in Eastern Europe, but its implications can be seen in domestic supply chains of all the countries. Every sector of the economy and its respective supply chains are being stressed by the war. Billions of dollars are being lost every day due to stalling of global supply chains. The supply chains around the world especially in Eastern Europe will need years to come back on track. Companies will have to make structural shifts in global supply chains in order to mitigate any such further disruptions and ensure their resilience.

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