Covid-19’s Impact on Global Trade V-Shaped Recovery

# Abstract

The COVID-19 pandemic has had a profound impact on all aspects of human life, including health, economy, education, and personal lives. Among these, global trade—comprising both exports and imports—has been significantly affected. This report investigates the influence of the pandemic on global trade, focusing on the disruptions caused by zero-COVID policies, lockdowns, factory shutdowns, supply chain disruptions and new technological innovations. Despite initial setbacks, global trade experienced a surprising V-shaped recovery, not only rebounding to pre-pandemic levels but also doubling in volume. This study aims to explore the dynamics of this recovery, the countries and sectors most affected, and the new opportunities that have emerged in the global trade landscape as a result of the pandemic.

# Introduction

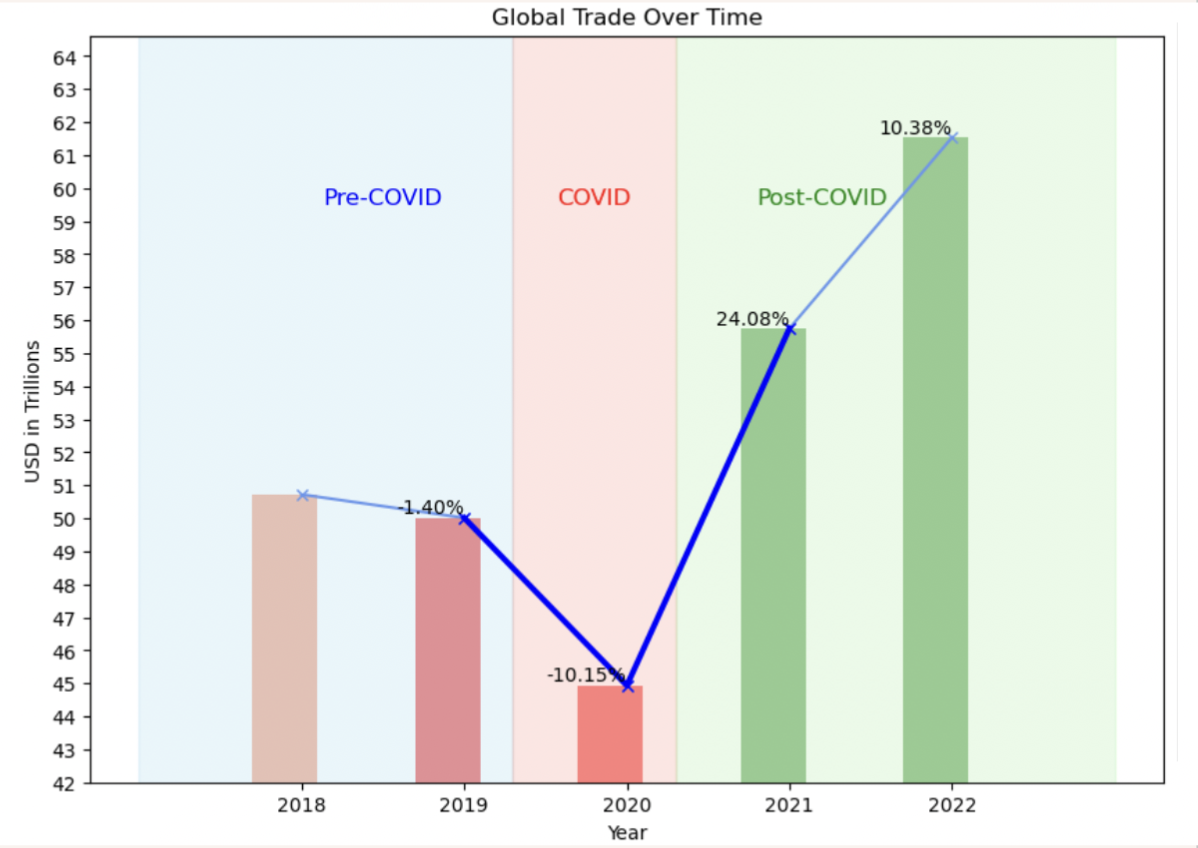
The advent of the COVID-19 pandemic brought about unparalleled challenges that rippled through the world economy, disrupting the flow of goods, services, and resources across borders. Global trade, a critical indicator of economic health and inter-country cooperation, faced significant hurdles due to stringent measures implemented worldwide to curb the spread of the virus. These measures included zero-COVID policies, extensive lockdowns, and the consequent disruptions in supply chains and manufacturing activities. The immediate impact on global trade was stark, leading to widespread concerns over long-term economic consequences.

However, the narrative of global trade during the pandemic is not solely one of decline and despair. Amidst the challenges, a surprising trend emerged—a robust V-shaped recovery that not only signified the resilience of global markets but also pointed to a complex set of factors that fueled a remarkable resurgence in trade activities. This recovery has implications that extend beyond mere economic metrics, suggesting a transformative shift in international commerce and supply chain dynamics.

This report is dedicated to unpacking these phenomena. It aims to dissect the reasons behind the V-shaped recovery in global trade, identify the countries and sectors that were pivotal to this turnaround, and analyze the impacts—both positive and negative—that the pandemic has had on international trade. Through detailed exploratory data analysis, this study provides insights into how global trade navigated through the pandemic, the shifts it underwent, and the lessons it offers for future resilience and growth in the face of global challenges.

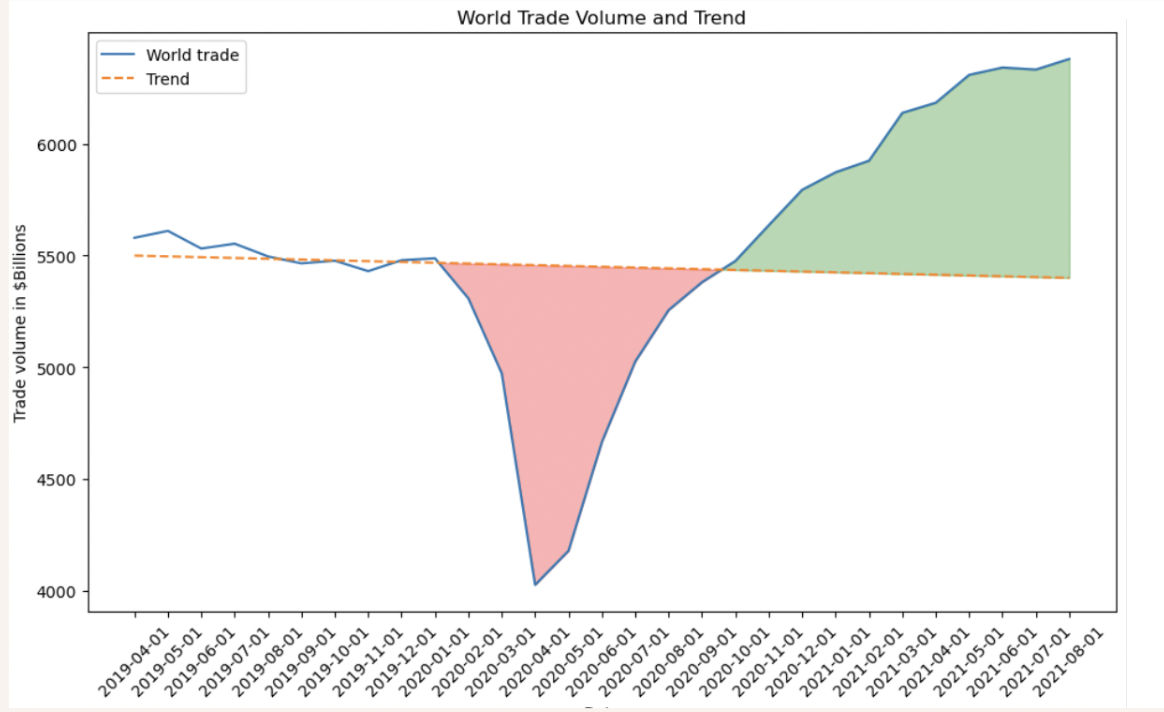
# Impact on Global Trade - An Overview

The onset of the COVID-19 pandemic introduced a period of uncertainty in global trade, with no uniform timeline applicable worldwide due to the staggered nature of the pandemic's spread and impact. For the sector of exports and imports, the critical time frame is pinpointed between early 2020 and the early months of 2021. It was within this window that the most dramatic shifts occurred as major economies suspended trade activities, only to cautiously rekindle them by the end of 2020, fortified by newly designed trade policies and strategic actions to revitalize commerce.



Under normal circumstances, a 2-3% fluctuation in trade figures would warrant concern; however, the image provided indicates a substantial 10.15% decline in global trade during the designated COVID-19 period of 2020. This plunge far exceeds typical alarm thresholds and epitomizes the seismic shock inflicted upon international economies and supply chains, disrupting businesses and livelihoods on an international scale.

Counterintuitively, in the aftermath of this contraction, global trade not only recuperated but also surged significantly, registering a 24% growth, equivalent to over 55 trillion USD. This leap forward not only returned trade volumes to their former glory but propelled them to heights 10% greater than the pre-pandemic era, delineating a stark V-shaped recovery. Such a robust rebound may be attributed to several factors:

- Inventory depletion: Throughout the pandemic, companies continued operations, leading to the gradual emptying of warehouses due to stalled trade. The resumption of trade necessitated substantial restocking alongside meeting ongoing market demands.

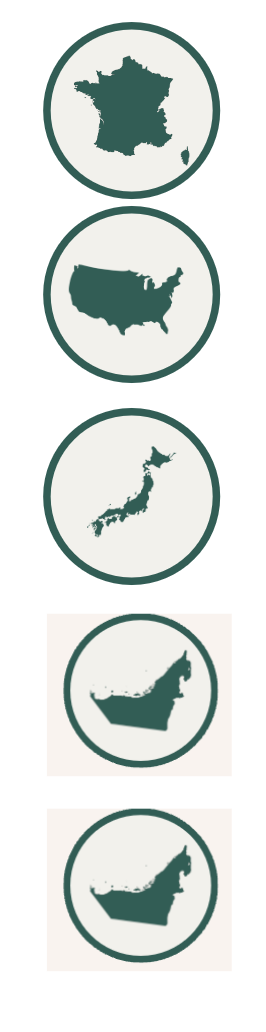
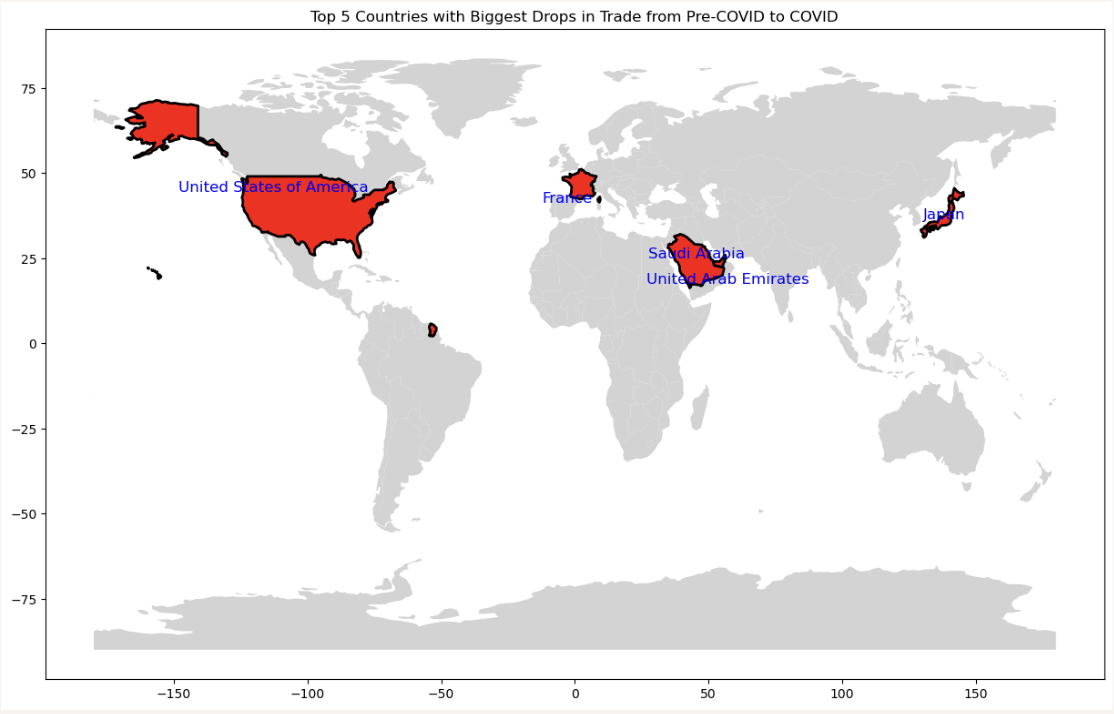
- Trade policy reforms: Nations across the globe formulated and instituted robust trade policies, specifically tailored to accelerate recovery and capitalize on the reopening of markets.

- Consumer behavior: Structural changes in lifestyle, prompted by the pandemic, led to alterations in consumer spending habits that may have significantly influenced trade dynamics.

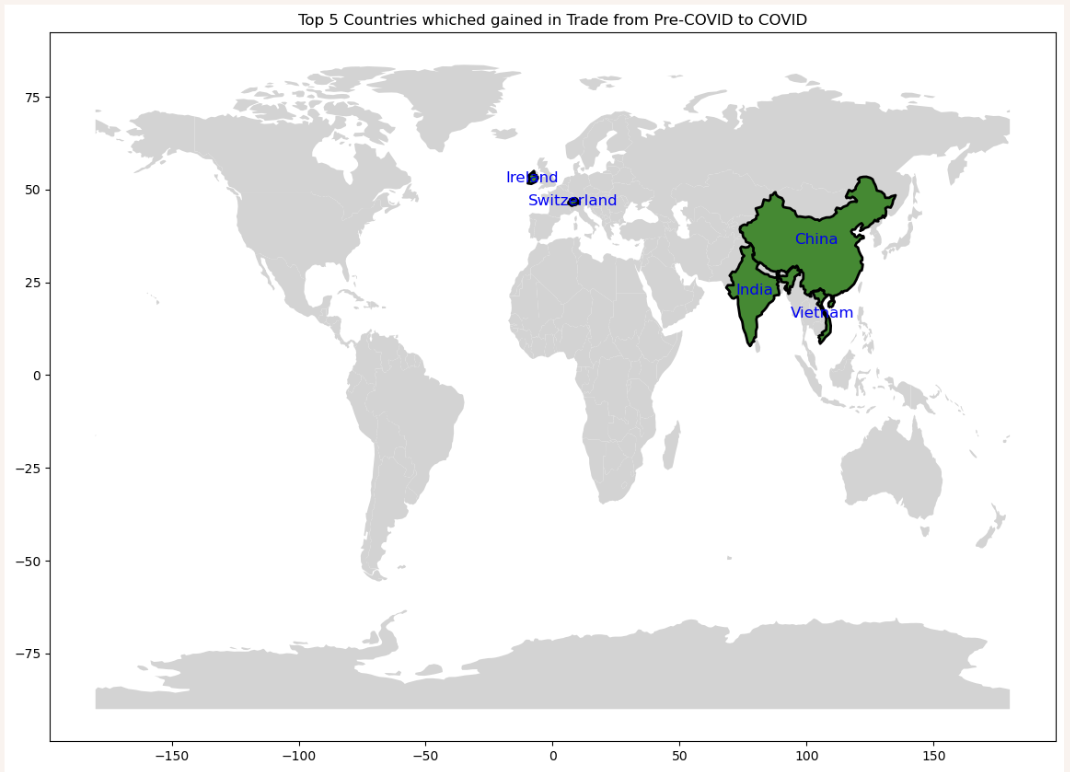
Our analysis centers on highlighting the extent of COVID-19's impact on global trade rather than dissecting each contributory factor's role. We aim to provide an unobstructed view of the stark disparities in trade flows pre-COVID, during the pandemic, and in the subsequent phase of recovery, capturing the resilient spirit of global commerce in the face of unparalleled adversity.

# Impact on major Countries

The economic tremors of the COVID-19 pandemic were felt unevenly across the globe, with some countries bearing the brunt more than others. The United States, Japan, Saudi Arabia, the United Arab Emirates, and France each experienced substantial negative impacts, each with a unique narrative tethered to their economic structure and export profiles.



In Japan, known for its manufacturing and export of luxury goods, the pandemic-induced downturn was sharply felt. The global demand for such items dwindled as consumer priorities shifted towards essentials, leaving Japan's luxury market in a lurch. Saudi Arabia and the UAE, economies deeply intertwined with the production and export of crude oil, faced a stark decline in demand as the pandemic forced a worldwide cessation of travel and a slowdown in industrial activities. This near standstill in oil consumption struck at the core of their trade revenues and economic stability.



On the other side of the spectrum, some countries managed to pivot and thrive amid the crisis. China and India, for instance, became key players in the supply chain for agricultural products and medical supplies, including vaccines and PPE kits, thereby creating a surge in demand for their exports. Vietnam also adapted swiftly, finding its footing despite global disruptions.

Switzerland's unique position allowed it to navigate the pandemic with minimal impact. The country's decision not to implement stringent lockdowns or zero-COVID policies meant that its economic activities continued with less disruption, helping to maintain its trade flows.

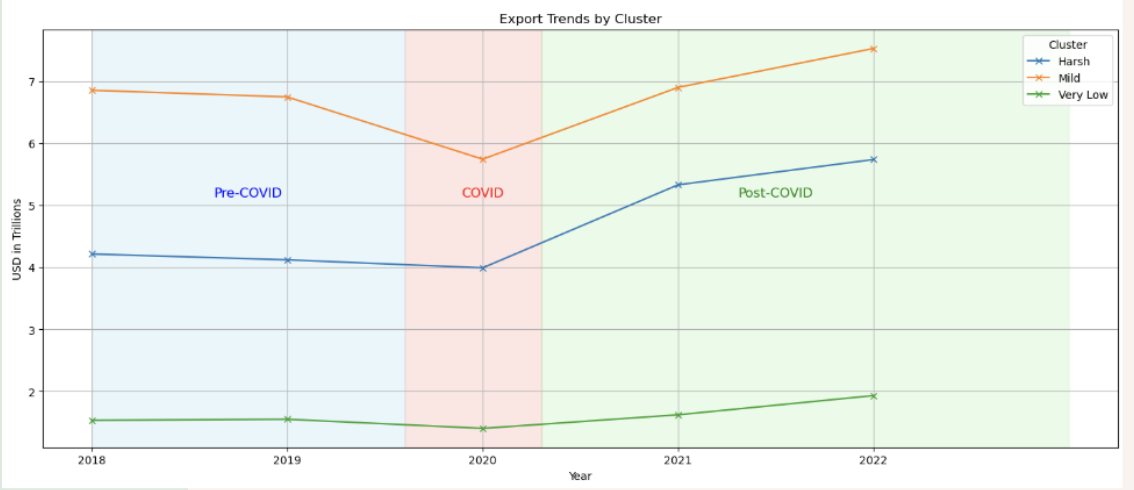
Ireland, with its strategic focus on the IT sector, capitalized on the global shift towards digitalization. As remote work and digital services became the norm, Ireland's IT exports saw a significant increase, positioning it favorably in global trade during these tumultuous times.

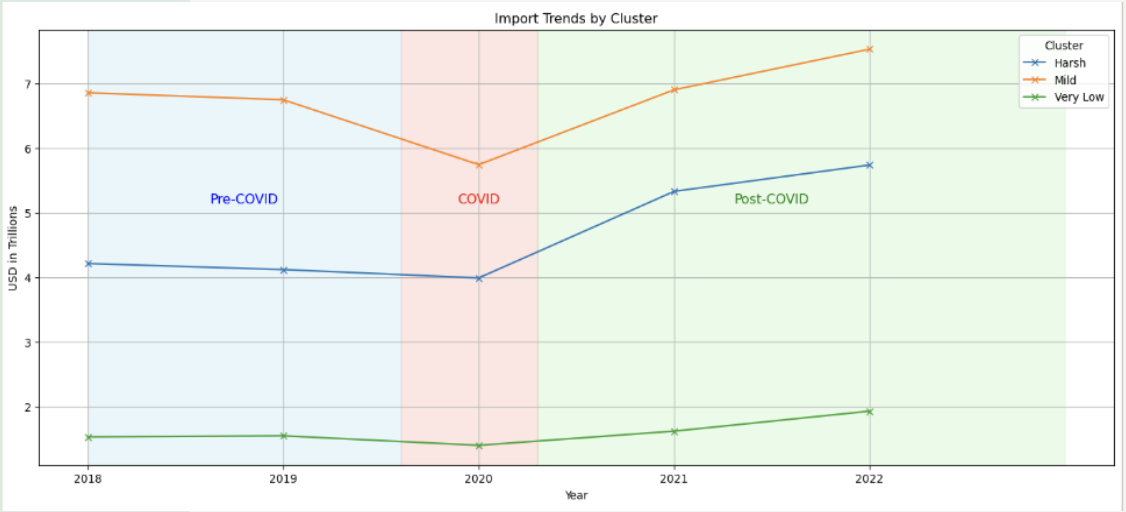
The dichotomy of impact underscores the varied nature of economic resilience and adaptability in the face of a global crisis. Each of these countries' stories illustrates a facet of the complex tapestry of global trade, revealing both vulnerabilities and opportunities that have reshaped international economic landscapes in the wake of the pandemic.

# Impact due Covid Policies

The response to the COVID-19 pandemic saw countries across the globe implement a range of policies with varying degrees of restrictiveness. Our study has categorized these into three clusters based on the severity of the measures: harsh, mild, and very low. The harsh cluster includes China, India, the Russian Federation, and Iran; the mild cluster comprises the United States, United Kingdom, France, Italy, Canada, Japan, Saudi Arabia, and Kuwait; and the very low cluster consists of Qatar, the United Arab Emirates, Australia, Switzerland, and New Zealand.

From the export trends shown in the image, it appears that countries with harsh COVID policies experienced a significant drop in exports during the pandemic, but also a notable post-COVID rebound. This rebound might be attributed to the pent-up demand that was released once restrictions were eased and normal trade activities could resume. The very low policy cluster showed remarkable resilience in exports during COVID, suggesting that less restrictive measures may have allowed these economies to maintain more stable trade flows.





Import trends tell a different story. The mild policy cluster demonstrated resilience in imports, indicating that despite moderate restrictions, these countries managed to keep their import activities relatively stable. Interestingly, the harsh policy cluster, after an initial dip, showed a substantial post-COVID increase in imports. This may reflect the resurgence of domestic demand as these countries began to emerge from the stringent lockdowns and supply chain restocking ensued.

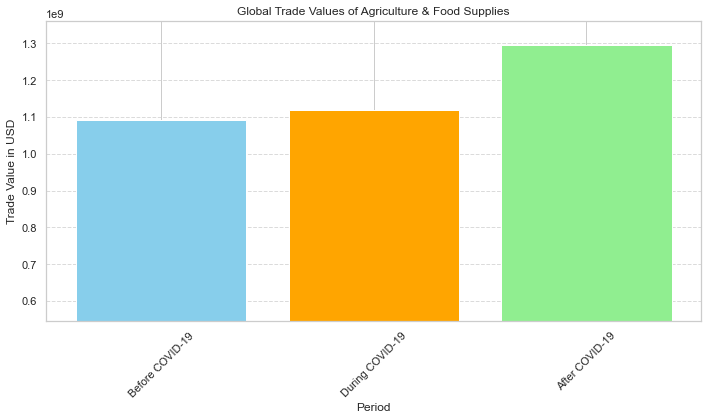
One inference from the import and export trends is that the severity of a country’s COVID policies had a complex impact on its trade dynamics. Harsh policies may have initially contracted trade but also seem to have set the stage for a strong recovery. In contrast, countries with very low restrictions managed to maintain a degree of consistency in trade throughout the pandemic, potentially avoiding the severe economic shocks experienced by others. The mild policy countries, with their balanced approach, navigated through the pandemic with a mix of resilience and adaptability, managing to keep their import channels relatively open despite the global tumult.

The below image offer a visual representation of the net trade balances for countries across three distinct periods: Pre-COVID (2018-2019), During COVID (2020-2021), and Post-COVID (2021-2022), illustrating the shifts in trade dynamics attributable to the pandemic's influence.

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# Impact on Agricultural Trade

The COVID-19 pandemic, a global health crisis of unprecedented scale, severely disrupted many sectors of the economy worldwide. However, the agricultural trade sector demonstrated remarkable resilience throughout this period. Unlike other sectors that faced significant challenges, agricultural trade experienced no major negative impacts during the pandemic, showcasing the critical nature of agricultural products as essential commodities. This subsection explores the dynamics of agricultural trade during and after the COVID-19 pandemic, highlighting its slight increase during the pandemic and the significant growth observed afterward.



Stability and Slight Increase During the Pandemic

As countries around the world implemented lockdowns and restrictions on movement to curb the spread of COVID-19, the demand for essential goods, particularly food products, remained stable or even increased in some regions. The intrinsic nature of agricultural products as basic necessities meant that the trade of such goods continued despite the global disruptions. Contrary to the initial fears of substantial negative impacts, the agricultural sector saw a slight increase in trade volumes during the pandemic. This increment can be attributed to the heightened demand for food security and stockpiling by consumers facing uncertainties regarding the duration and impact of the pandemic.

Significant Increase in Trade Post-Pandemic

Following the gradual easing of COVID-19 restrictions and the initiation of recovery processes in various economies, the agricultural trade sector not only rebounded but also registered significant growth. This surge can be linked to several factors, including the revitalization of global supply chains, increased consumption as restaurants and food services resumed operations, and the continued high demand from countries bolstering their food reserves. The post-pandemic period underscored the sector's critical role in global trade, highlighting its resilience and capacity to adapt to changing global dynamics.

Reallocation Rather Than Reduction

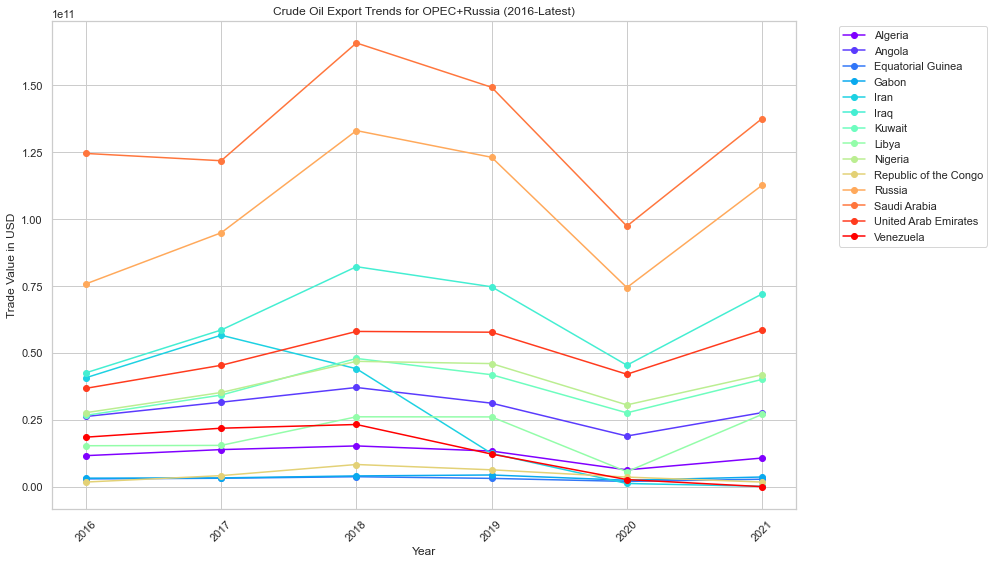
An interesting aspect of agricultural trade during the COVID-19 pandemic was the phenomenon of reallocation. While certain supply chains faced disruptions due to logistical challenges and restrictions, the overall global trade of agricultural products did not halt. Instead, there was a strategic reallocation of resources and trade routes to mitigate the impacts of localized disruptions. Countries and businesses quickly adapted to changing conditions, redirecting their exports to markets with accessible trade routes and lower barriers, thus ensuring the continuous flow of agricultural trade. This adaptability and resilience were crucial in maintaining global food security during uncertain times.

Conclusion

In summary, the agricultural trade sector exhibited remarkable resilience throughout the COVID-19 pandemic, characterized by stable trade flows, a slight increase in trade volume during the pandemic, and significant growth in the aftermath. The sector's ability to adapt and reallocate resources effectively ensured that the global trade of essential agricultural commodities remained uninterrupted. This resilience not only highlights the essential nature of agricultural products but also underscores the importance of global cooperation and flexibility in trade policies to navigate through unprecedented global challenges.

# Impact on trade of crude oil

The crude oil sector, pivotal to the global economy, encountered substantial turbulence during the COVID-19 pandemic. The unprecedented global health crisis and the subsequent economic downturn significantly impacted crude oil trade, particularly among the OPEC+ alliance and Russia. This subsection delves into the dynamics of the crude oil market during this period, highlighting the significant dip in trade volumes during the pandemic and the subsequent recovery to pre-COVID levels, albeit with lingering challenges in achieving a balanced trade.



Significant Impact and Initial Dip

As COVID-19 rapidly spread across the globe, governments imposed lockdowns and travel restrictions in an effort to contain the virus. This led to a drastic reduction in demand for crude oil, as transportation, one of the largest oil-consuming sectors, came to a near standstill. Consequently, OPEC+ countries and Russia, key players in the global oil market, faced a significant drop in oil demand and prices. The initial months of the pandemic saw oil prices plummeting to historic lows, with futures contracts even entering negative territory at one point, underscoring the severity of the impact on the crude oil trade.

Recovery to Pre-COVID Levels

In response to the crisis, OPEC+ and Russia undertook unprecedented measures to stabilize the market. These included significant production cuts and coordinated efforts to manage supply in line with the reduced demand. As countries gradually lifted lockdown measures and economic activities resumed, the demand for crude oil began to recover. By the latter part of 2020 and into 2021, crude oil prices and trade volumes started to rebound, approaching pre-COVID levels. This recovery was supported by a global push to reignite economies, coupled with the optimism generated by the rollout of COVID-19 vaccines, which spurred hopes of a return to normalcy.

Lost trade not recovered

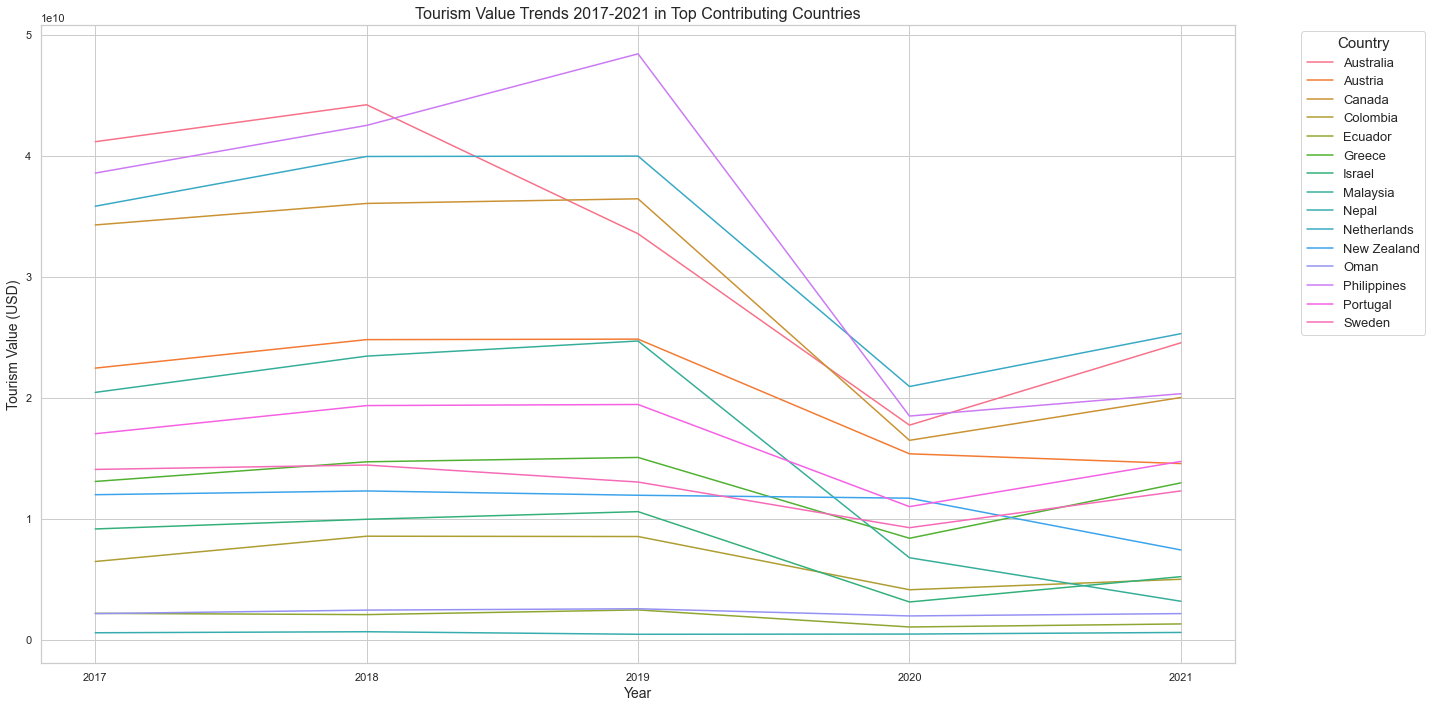
As we have seen in the global trade values graph post recovery there was a significant jump in the trade values from precovid levels since the lost trade value has to be recovered. Since crude oil is an ondemand product the lost trade has not been recovered.

Conclusion

The COVID-19 pandemic delivered a profound shock to the crude oil market, causing a significant downturn in trade volumes and prices among OPEC+ countries and Russia. While the sector has shown resilience through a notable recovery to pre-pandemic levels, the path to a fully balanced trade remains fraught with challenges. The ongoing market dynamics underscore the need for strategic adaptability and coordination among major oil-exporting nations as they confront both immediate and long-term uncertainties in the global energy landscape.

# Impact on Tourism

The tourism industry, one of the most dynamic and vital sectors for many economies around the globe, faced an unprecedented crisis due to the COVID-19 pandemic. Characterized by international travel bans, lockdowns, and a pervasive atmosphere of uncertainty, the pandemic's impact on tourism was both immediate and profound, resulting in significant economic ramifications. Unlike some sectors that have begun to recover and, in some cases, even exceed pre-pandemic levels, the tourism industry has struggled to achieve a similar rebound. This section explores the profound impact on tourism, the mitigating strategies employed by countries, and the uneven recovery process, with a focus on the contrasting experiences of European nations and tourism-dependent countries like Sri Lanka and Maldives.

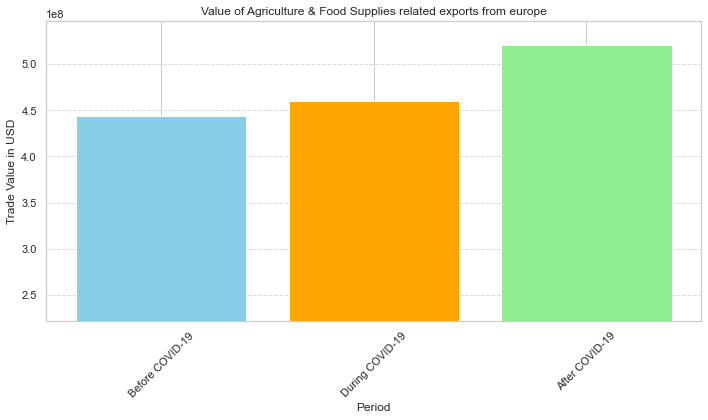


Significant Impact and Drop in Tourism

As countries closed their borders and imposed strict quarantine measures to control the spread of the virus, international and domestic travel plummeted. The tourism industry, heavily reliant on the free movement of people, experienced a dramatic decline in revenues, with hotels, airlines, and related services facing existential threats. The drop was as expected, significant, and unlike many other economic sectors, the tourism industry has not yet recovered to pre-COVID levels. The prolonged nature of the pandemic, alongside sporadic outbreaks and new variants, has contributed to the slow recovery, with traveler confidence remaining subdued.

Countermeasures and Diversification: The European Example

In response to the tourism downturn, several countries and regions have looked to diversify their economies to mitigate the impact. Europe serves as a notable example, where countries have sought to counterbalance the tourism deficit through bolstering other sectors such as agriculture, medical, and information technology (IT) exports.



During and after the COVID-19 crisis, Europe witnessed a significant increase in the value of agricultural exports. This uptick in agri-exports has been part of a broader strategy to leverage the EU's diverse economic base to compensate for the losses in the tourism sector. Additionally, the acceleration of digital transformation and the increased demand for medical products on the global stage have provided alternative revenue streams for economies traditionally reliant on tourism.(See the next two sections)

The Struggle of Tourism-dependent Countries

Conversely, countries that are heavily dependent on tourism and have less capacity to rapidly diversify their economies have faced more significant challenges. Sri Lanka and Maldives are prime examples of nations where tourism is a cornerstone of the economy. The sharp decline in tourist arrivals left these countries grappling with reduced foreign exchange earnings, leading to broader economic distress.

Without significant agro, medical, or IT exports to fall back on, these nations have struggled to recover from the economic fallout. The situation underscores the vulnerability of heavily tourism-dependent economies to global shocks and highlights the importance of economic diversification as a buffer against future crises.

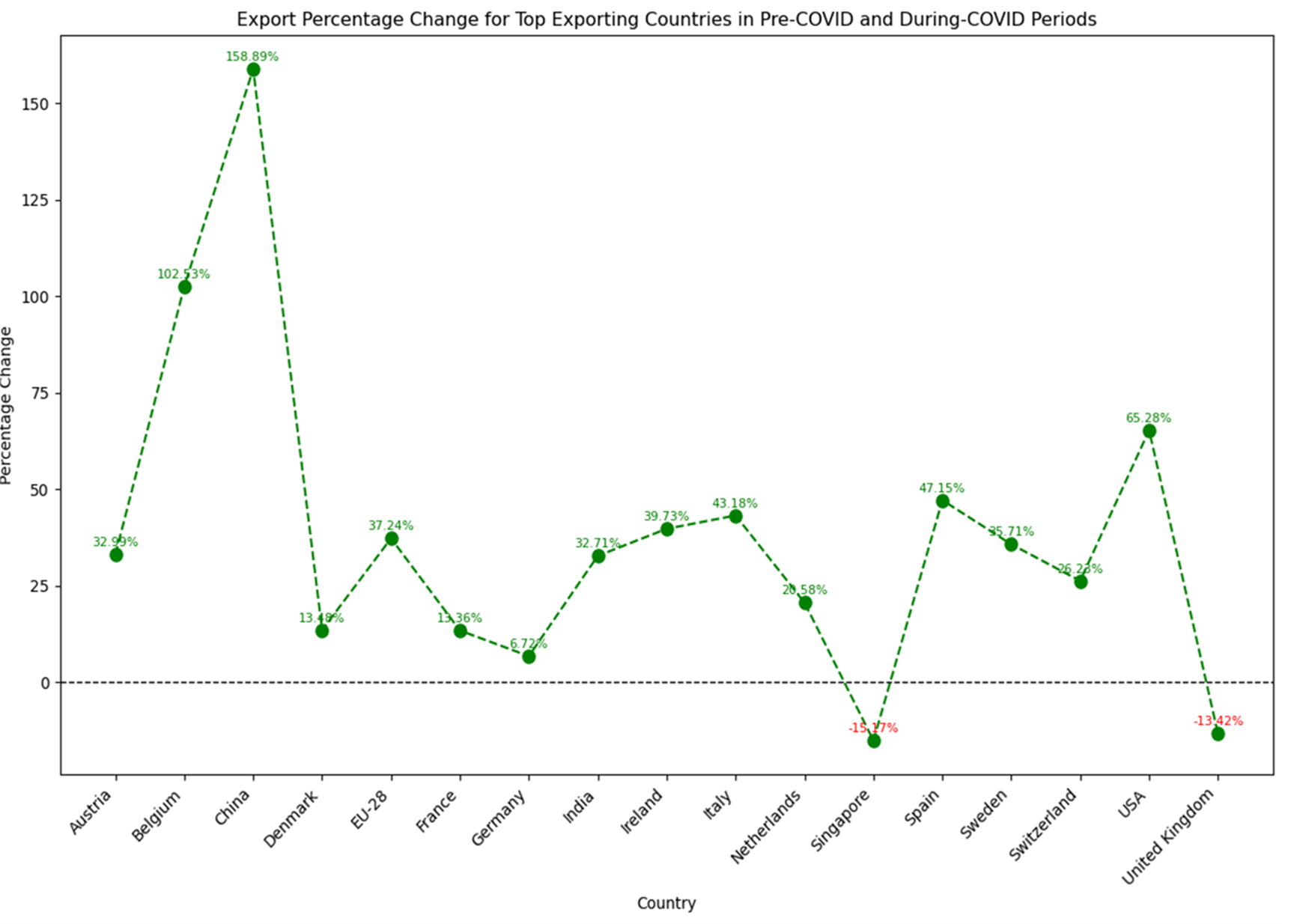
Conclusion

The COVID-19 pandemic has underscored the fragility of the global tourism industry to unprecedented shocks. While some regions, such as Europe, have managed to mitigate the impact through diversification and the strengthening of alternative sectors, tourism-dependent countries have faced a more arduous path to recovery. The pandemic has served as a catalyst for rethinking the resilience of tourism-centric economies and the necessity of developing multifaceted strategies to safeguard against future disruptions. As the world gradually emerges from the shadow of COVID-19, the path to recovery for the tourism sector remains uncertain, with a clear need for innovation, adaptation, and strategic diversification.

# Impact on countries with strong medical exports

The COVID-19 pandemic has dramatically altered global trade dynamics, especially in the medical sector. We analyzed the impact of the pandemic on countries known for their strong medical exports, focusing on China, Europe, the USA, and other significant players. To understand the changes in medical exports, we first identified countries within the top 10% in terms of medical exports before the pandemic. We then analyzed export data from 2017 to 2019 (pre-COVID) and from 2019 to 2022 (during COVID). During the pre-COVID era, we observed a noticeable increasing trend in medical exports for countries with strong medical sectors

The below graph shows the ‘Export Percentage change for top Exporting countries in pre-covid and during-covid periods

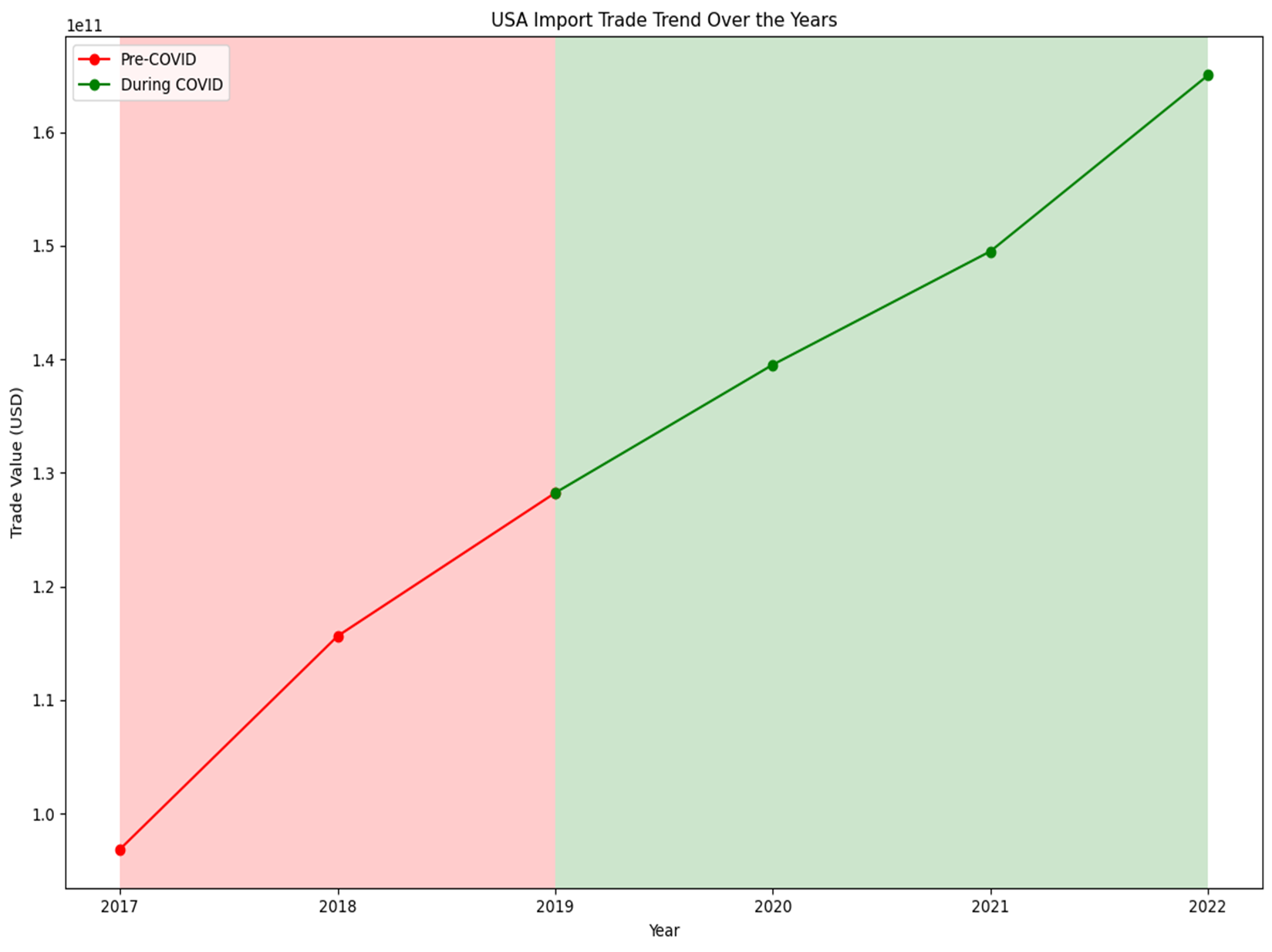


Several trends emerged from this:

* China and Belgium exhibited very high percentage increases in medical exports.
* However, the USA, despite being a top exporter, experienced an overall negative percentage change during the pandemic.

To better understand and analyze the decline in US exports, we investigated import trends for the USA. We found a substantial linear increase in imports from 2019, suggesting possible reasons such as supply chain disruptions and a surge in demand for medical supplies within the USA.

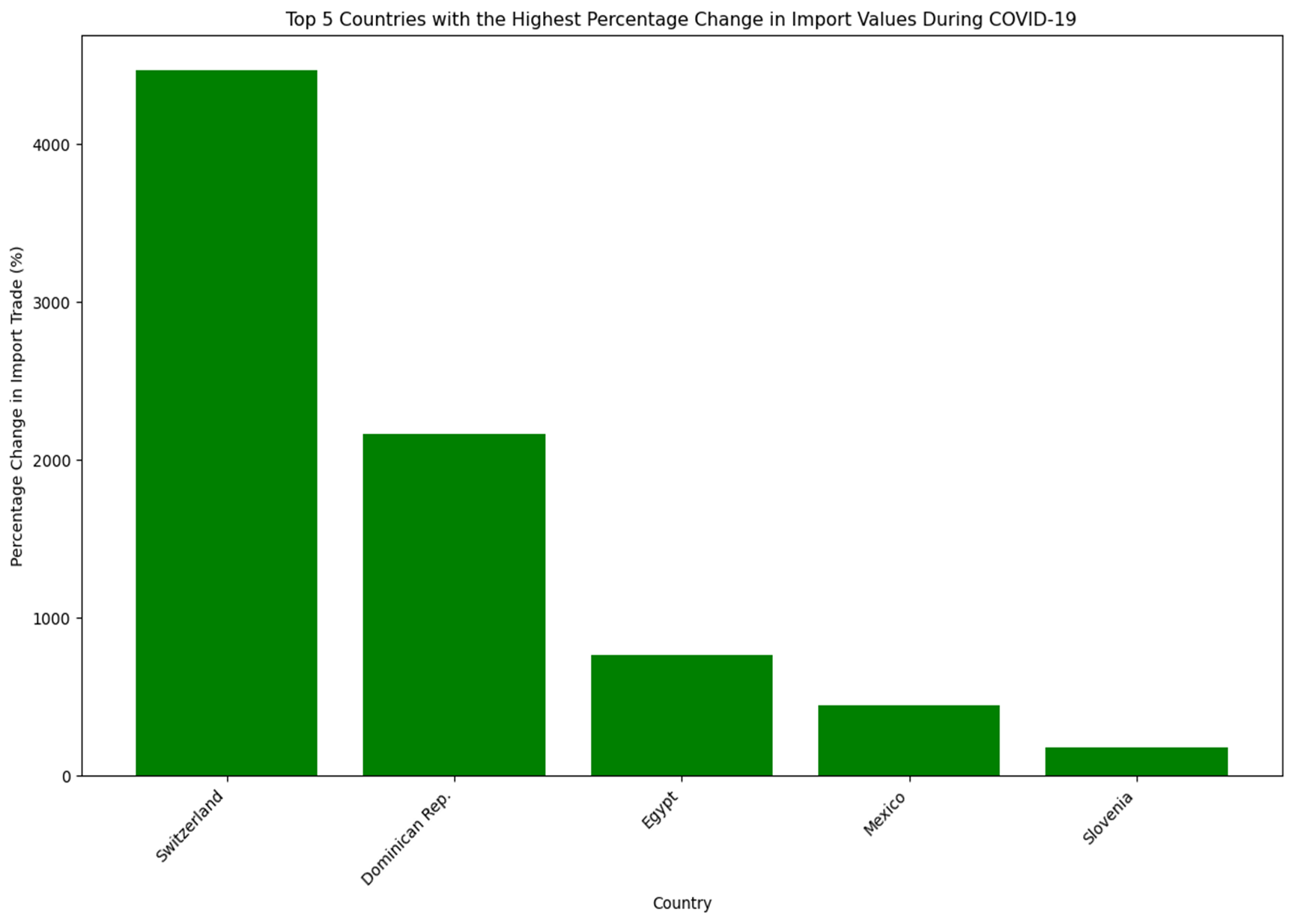
Below graph shows our analysis-



Insights that can be drawn from this graph includes-

* The USA saw a significant increase in imports from 2017 to 2022 and the reason for this can likely be “due to supply chain disruptions and increased domestic demand”.
* High percentage changes in imports during the pandemic period further indicate a surge in demand for medical supplies globally.

For the impact due to imports we further analyzed top 5 countries that were having highest percentage change of imports during covid pandemic and obtained the subsequent graph shown below



The graph clearly shows countries like Switzerland, Dominican Republic, Egypt as the top importing countries during the covid-19 due to surge in demand of medical supplies in these areas.   
  
After the careful analysis for the impact due to medical exports/imports the following conclusion and recommendations can be given-

**Conclusion**: Countries with robust medical export sectors generally saw an increase in exports during the COVID-19 pandemic. However, the USA and Singapore stood out as exceptions, experiencing declines in exports. Factors such as supply chain disruptions and increased domestic demand played crucial roles in shaping these trends.

**Recommendations**: To mitigate future disruptions and capitalize on global demand for medical supplies, policymakers and industry stakeholders should focus on strengthening supply chains, investing in domestic production capabilities, and fostering international collaborations. Additionally, diversifying export markets could help buffer against fluctuations in demand in specific regions.

# IT Industry Trends During COVID

During COVID-19, the IT industry saw a rapid acceleration of digital transformation, driven by increased demand for remote work tools, cloud computing, and cybersecurity solutions. E-commerce and healthcare IT sectors experienced significant growth, while highlighting the critical importance of technology in maintaining operations and driving resilience during the pandemic.We performed a comparative study to identify trends in the IT industry in the pre-pandemic and pandemic era treating 2016-2019 as “pre-pandemic” and 2020-2022 as “pandemic”

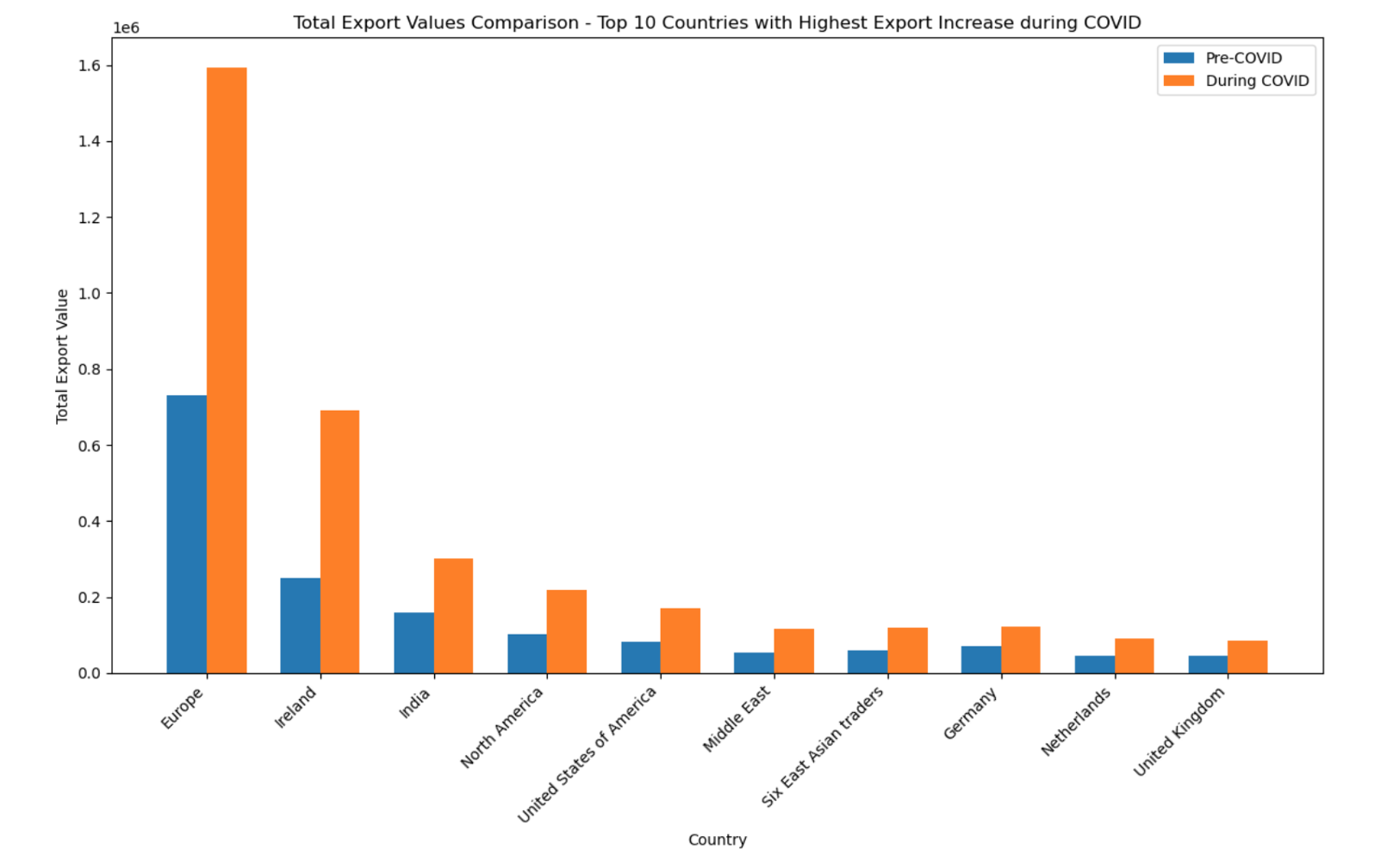
The below graph shows the “Overall Trend of Trade Over Years”

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Insights that can be drawn from this graph includes-

* The overall trade for the IT industry increased during COVID
* Increase might be justified due to heightened demand for remote work solutions

This trend shows the potential of the IT industry to be the backbone of economies of countries, having solid digital infrastructure, during unprecedented times. To further gain insights into which countries benefited the most, we have plotted a graph of “Total Export Values Comparison for the top 10 countries”



The graph clearly shows that Europe, Ireland, India, USA(North America) were some of the biggest gainers owing to their strong IT Infrastructure

After the careful analysis for our topic, the following conclusion and recommendations can be given-

**Conclusion**: Amidst the COVID-19 pandemic, countries with robust IT service export sectors generally witnessed an uptick in exports, yet exceptions like the USA and Singapore experienced declines, attributed to supply chain disruptions and domestic demand fluctuations.

**Recommendations**: To navigate future disruptions and optimize opportunities in the global IT trade, policymakers and industry leaders should prioritize fortifying supply chains, enhancing domestic production capacities, and fostering cross-border partnerships. Diversifying export markets can also safeguard against vulnerabilities arising from fluctuations in demand within specific regions.

# ChatGPT Usage

# Prompts Used

Prompt: “What countries are highly affected due to tourism and hospitality. Are there any major economies?”

Tourism is one of the biggest revenue generation industries in the world. So analyzing this is important in understanding the trade dynamics.

ChatGPT, prompted that majorly European economies are affected due to this tourism & hospitality disturbances.

Prompt: “What countries are benefited via trade(exports&imports) during this time?”

This is very important because in our thesis we also mentioned of discussing about the countries and sectors benefited via trade during this time.

Prompt: “What about IT exports and imports and which countries are benefited from this?”

Trade of physical goods and commodities were halted, but IT services exports increased drastically. Big economies like India, China will be benefited by these.

Prompt: In global trade does trade volume means, exports+imports?

Yes, in the context of global trade, "trade volume" typically refers to the total amount of trade conducted by a country or region, which includes the sum of its exports and imports. This metric is used to measure the overall level of trade activity, indicating the economic interconnectedness and trade engagement of the economy with the rest of the world. Trade volume provides insights into the size of a country's market transactions with other nations, reflecting both the demand for its products and services abroad (exports) and its demand for foreign goods and services (imports).

Prompt: what is global trade volume in 2019?

Global trade volume refers to the total quantity of trade (including both imports and exports) conducted worldwide. It encompasses the trade of goods and services across international borders. Specific figures for global trade volume can vary by year, influenced by economic conditions, trade policies, and global events. For precise numbers, organizations such as the World Trade Organization (WTO) and the United Nations Conference on Trade and Development (UNCTAD) provide annual reports and statistics.

Prompt: How to plot background color and show that in legend in matplotlib

Python code output.

Prompt:What is the reason of USA linear import rate change during covid shifting them from top exporters to top importers

The shift in the USA's status from being a top exporter to a top importer during the COVID-19 pandemic can be attributed to various factors. While a linear import rate change is a simplified view, several complex and interrelated factors likely contributed to this shift. Some possible reasons include: Supply Chain Disruptions: The pandemic caused disruptions in global supply chains, impacting production and distribution. This might have led to a decrease in domestic production and an increased reliance on imported goods. Increased Demand for Medical Supplies: The surge in demand for medical supplies, such as personal protective equipment (PPE), pharmaceuticals, and medical equipment during the pandemic, may have driven an increase in imports to meet the domestic needs. Consumer Behavior Changes: Changes in consumer behavior during lockdowns and restrictions may have affected the types of goods imported. There could have been an increased demand for certain products that were not produced domestically. Economic Stimulus Measures: The U.S. government implemented economic stimulus measures to mitigate the impact of the pandemic. Increased consumer spending, coupled with stimulus packages, may have contributed to higher import volumes. Currency Fluctuations: Currency exchange rate fluctuations can influence trade balances. If the U.S. dollar weakened relative to other currencies, it could make imports more attractive. Shift in Global Trade Dynamics: The pandemic prompted changes in global trade dynamics, with some countries adapting their trade strategies. This could have influenced the flow of goods and the USA's position in the global trade landscape. Policy Responses: Government policies and trade agreements, implemented in response to the pandemic, might have influenced trade patterns. Tariffs, trade restrictions, or policy shifts could impact import and export volumes. Global Economic Recession: The economic impact of the pandemic led to a global recession. Countries, including the USA, may have adjusted their trade priorities in response to changing economic conditions. It's important to note that these factors are interconnected, and the shift in the USA's import-export balance is likely a result of a combination of these influences. A comprehensive analysis would require detailed examination of trade data, economic indicators, and policy decisions during the specific period in question.

Prompt: How to plot a line chart for my medical data of form xxxx to show the percentage change.

Python output

**What did not worked with ChatGPT**-

Prompt: “Reason for switzerland, dominican republic, egypt and slovenia having highest percentage increase in their imports during covid ?

The reasons it gave for high import values during covid are very generic and we cannot fully rely on the hallucinations without proper proof with data.