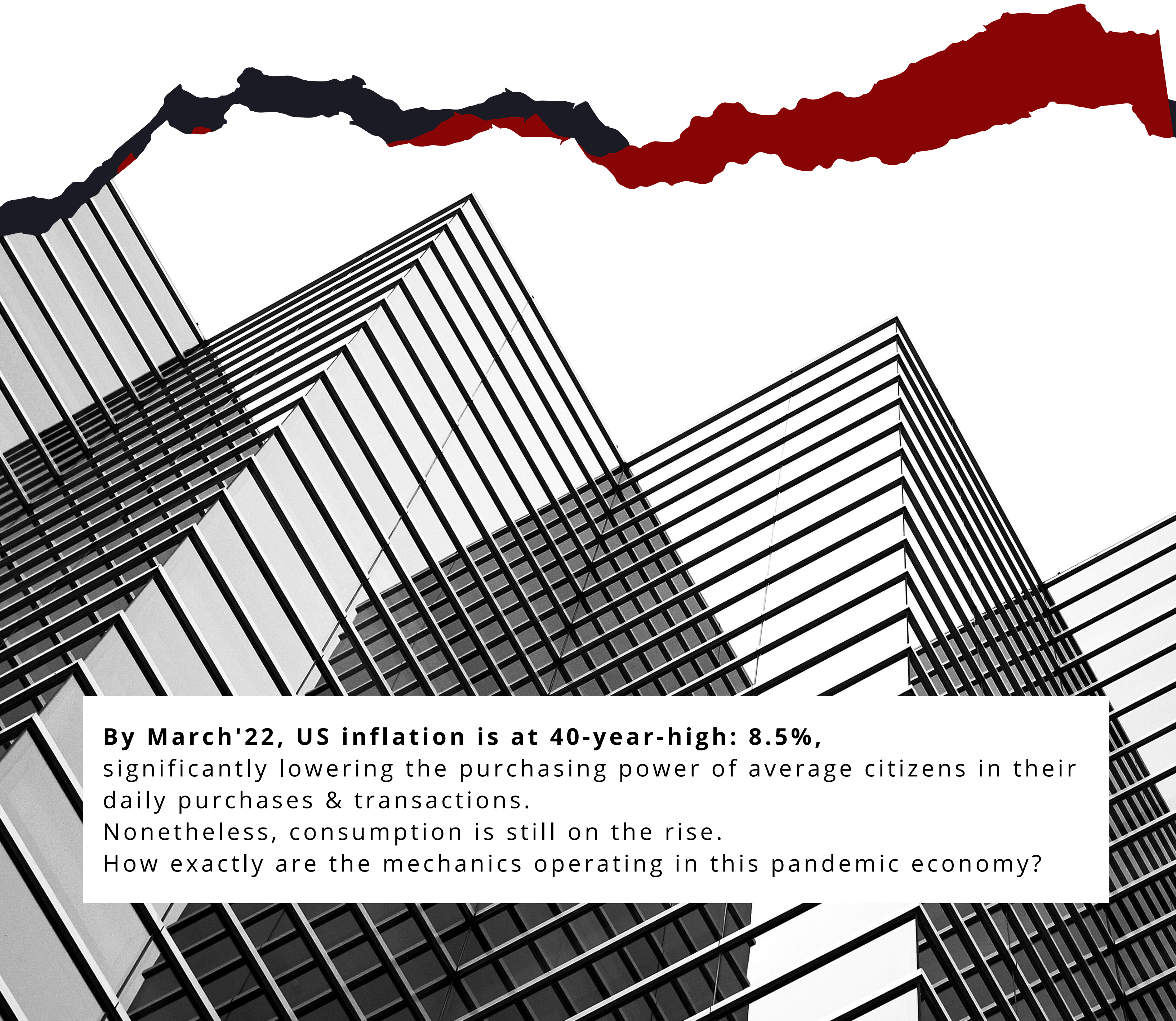
Chi Pham - Executive Summary

US PANDEMIC INFLATION

Causes & Impact



By March'22, US inflation is at 40-year-high: 8.5%,
significantly lowering the purchasing power of average citizens in their daily purchases & transactions.
Nonetheless, consumption is still on the rise.
How exactly are the mechanics operating in this pandemic economy?

CONTEXT & RESEARCH QUESTIONS

Inflation, or the increase in prices of goods and services, is directly related to the purchasing power of the dollars we hold. Currently, inflation is at a 40-year-high, which has led to rate hikes by the Federal Reserve. In this paper, we look at the factors contributing to this pandemic-high inflation rate of the US, as well as the implications of higher interest rates on the US economy.

What is contributing to the current pandemic economy's high inflation rate?

	Demand Side	Supply Side	Fed Policy
Research Questions	How has consumption affected inflation rate?	How do global supply chain disruptions put upward pressure on inflation?	How has the Fed been steering interest rates to fight inflation?
Hypothesis	Pent-up demand, revenge shopping, stimulus package	Supply bottlenecks & disruptions → high transaction costs, inventories.	2020 - 2021: Cut interest rates 2021 - Present: Rate hikes

I. Inflation Overview

History has proven, time and time again, that inflation is the main indicator of US economy.

Before the COVID pandemic, one significant event that will continue to have lasting after-effects on the economy is the **Financial Crisis** (2007-2010). At the beginning of the crisis, the overvaluation of housing prices and rates-adjustable mortgages led inflation rate to almost triple the Fed's target (2%) at 5.5%. However, after the mortgage bubble burst, inflation dropped drastically at an extremely steep slope, as measured by the historically low CPI of -1.9%. After drastic policy by the government and the Fed, the economy was quick to recover, and inflation was maintained around the ideal 2% - until the end of 2019.

2020 started with news of the first **COVID outbreak** in China. The Coronavirus delivered a full-blown shock to the global economy in March, forcing lockdowns and store closures in the US. In an unstable economy swayed by the deadly pandemic, inflation dropped again to 0.2%.

Thanks to government stimulus packages, despite a gloomy outlook on productivity, demand was lifted, national consumption increased. Inflation rose, yet this time, did not stop at the favorable 2% target rate. Ever since Fall 2020, CPI has been rising at a steeply linear pace, and is now at 8.5%, with no sign of stopping at least in the next 1.5 years. Increased inflation has been reflected in a range of product types: from Medical Care, Housing & Shelter, Energy & Food to Airline Fares, Used Cars and Apparel, etc. However, in terms of contribution, medical care spending topped the list, accounting for almost 30% of US inflation from 2020 till early 2022. This is intuitive given the presence of COVID-19 pandemic, which had a dramatic impact on the nation's health sector in 2020, driving a 9.7% growth in total national healthcare spending. Housing & Shelter comes second at roughly 20%. In 2020, the Fed cut interest rates to help stimulate the economy. Mortgage interest rates fell to their lowest levels ever at below 3%, driving up demand for housing and mortgage loans.

EDA & FINDINGS

An ideal economic equilibrium occurs when the quantity demanded is equal to the quantity supplied. However, the US economy right now is furthest from equilibrium. **An extreme shortage of global supply is failing to keep up with overheated demand.**

1. Excess Demand

There is a strong positive correlation between the bounce back in consumption (measured by real PCE) and the hike in inflation (CPI) from 2020-2022. Pent-up demand post lockdown, revenge shopping and government stimulus packages have largely stimulated US consumption, specifically in the e-commerce field. Mid-2020, e-commerce retailers saw sales skyrocketing at 30% change, double the rate of the previous 10 years (~15%). This shows a shift in consumer spending to online marketplaces given lock-down, physical store closure and health concerns. Real PCE, or consumption rate, not only directly points towards increased demand, but is also an indicator of the COVID's impact on different regions. In 2020, the Western region did best with positive growth in real PCE. On the other hand, Northeastern states were hit the hardest, with 8 states in the region having real PCE rates lower than -4.8%.

2. Supply Shortage

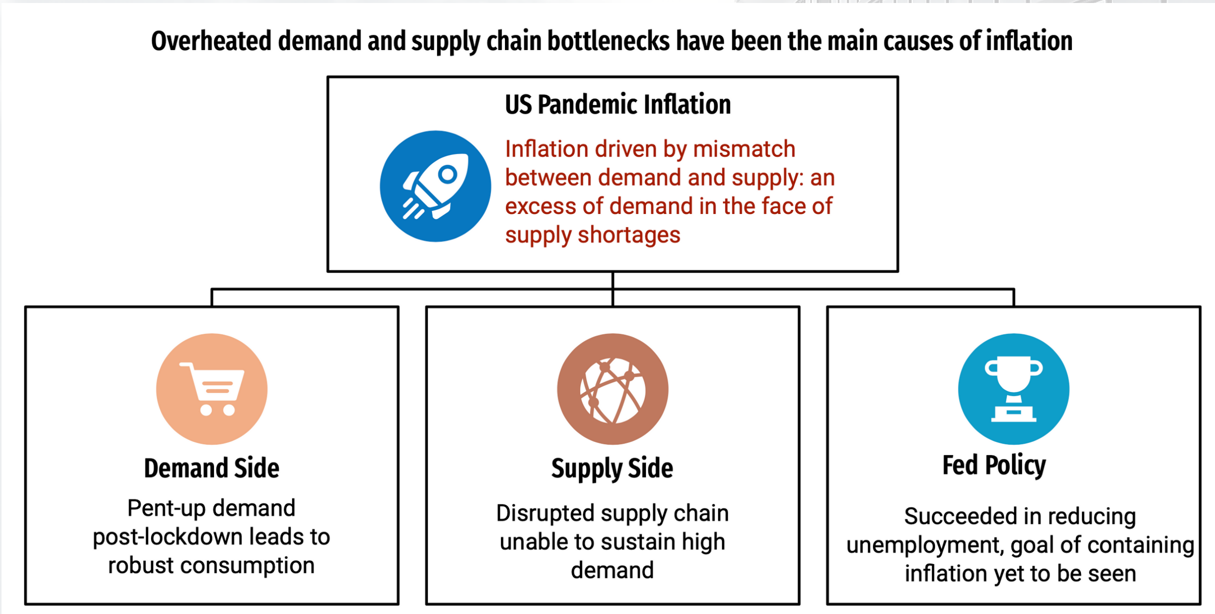
"Supply chain bottlenecks" is easily the hottest talk-in-town for the past year and a half. This global shortage in supply can be summarized in 3 main points: COVID-induced shortage of workers leading to decreased production capacity and manufacturing delays; transportation and freight cost went up sharply as a result of insufficient human resources; growing port congestion and extremely low storage due to excess demand. Inventories by all categories all saw declines at the start of the pandemic, however rebounded strongly afterwards as consumers increased purchases. In the Tech sector, global chip shortage caused by delayed production of TSMC - a monopoly in advanced chip foundries - has led to lower US outputs in car manufacturing, consumer electronics, and the world-wide favorite Apple products.

3. Fed Policy & Outlook

1. Easy monetary policy, interest rates cuts
For both the financial crisis (2007-2010) and the beginning of COVID-19 pandemic (early 2020), consumer demand and confidence in the economy dropped, The Fed reduced interest rates to almost zero-lower-bound in order to increase spending and pull the US economy out of recession. The Fed successfully achieved their goals, as seen by the subsequent bounceback of the economy.

2. Tight monetary policy, raise interest rates
Given the ongoing upward trend in inflation spurred by robust consumer spending and demand since mid-2020, the Fed currently aims to restrain inflationary pressures by gradually hiking interest rates. However, the tricky part is to simultaneously contain inflation and avoid triggering recession. Usually, higher short term interest rates slows the growth of the US economy, which can lead to higher unemployment, less demand, decreased confidence in the economy. The Yield Curve recently inverted, which is seen as an indication of recession (in 2 years' time). Thus, there is not yet any clear indication of Fed's policy success during this period of time.

CONCLUSION & FUTURE WORK

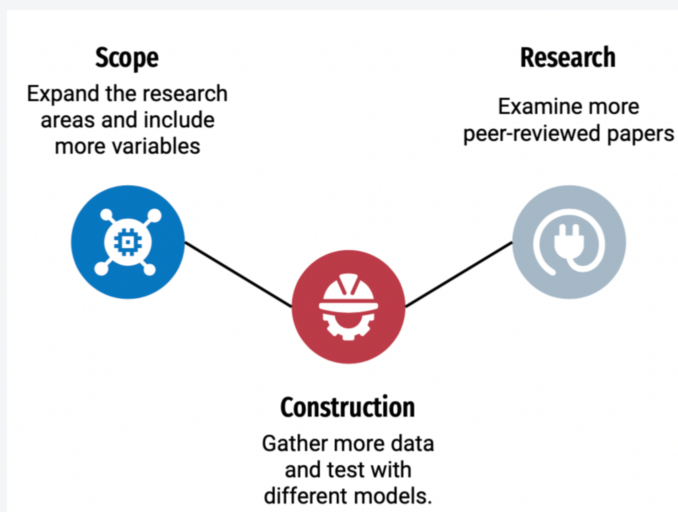


Future Research

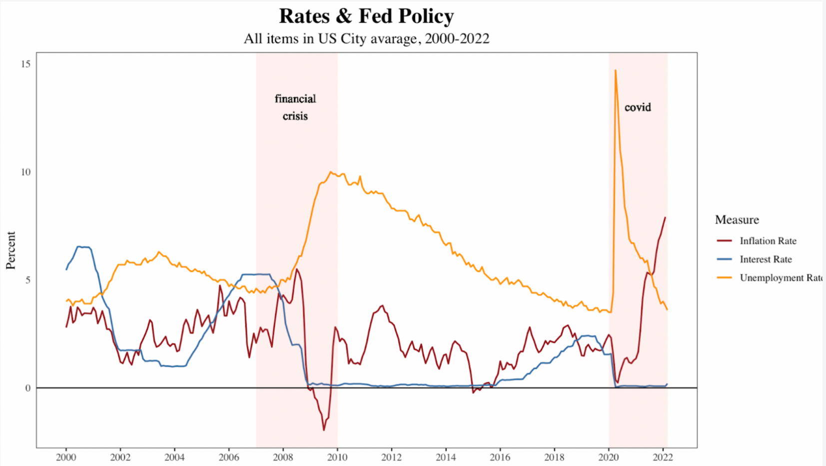
We would like to expand the scope of our analysis by including more variables and price in the **Ukraine-Russia crisis,** do more in-depth literature review and build a model predicting inflation from the most significant variables in our original dataset.

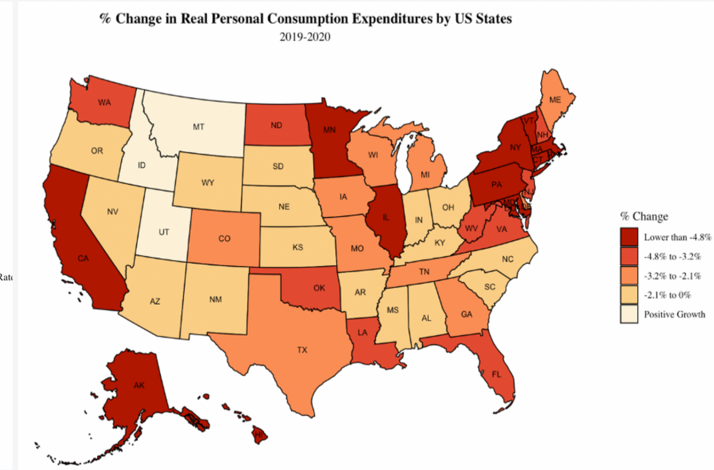
Data Sources

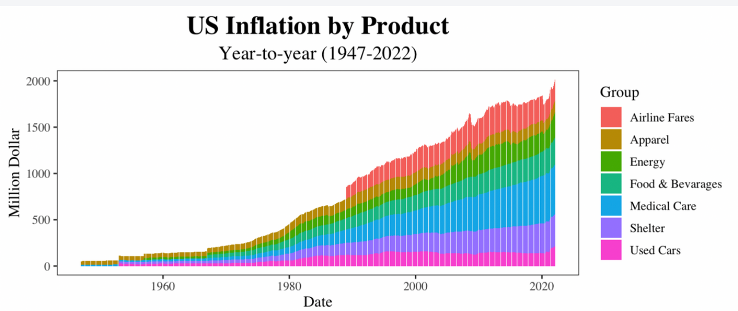
Time series & panel data from Federal Reserve Economic Data (FRED) and Bureau of Labor Statistics (BLS).

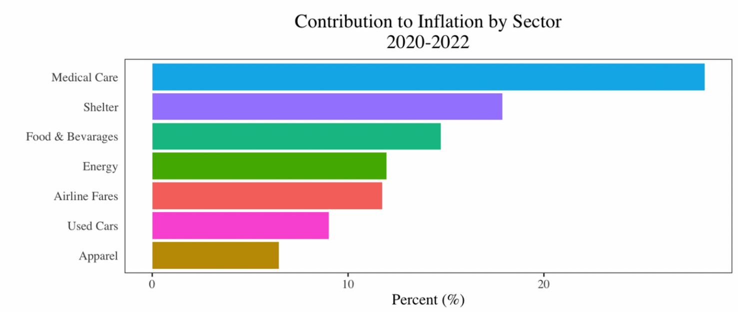


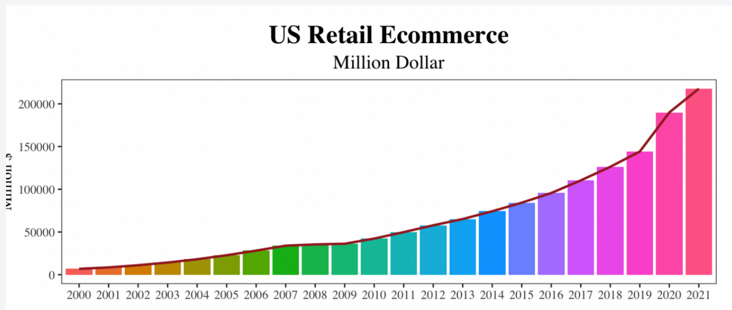
GRAPHS

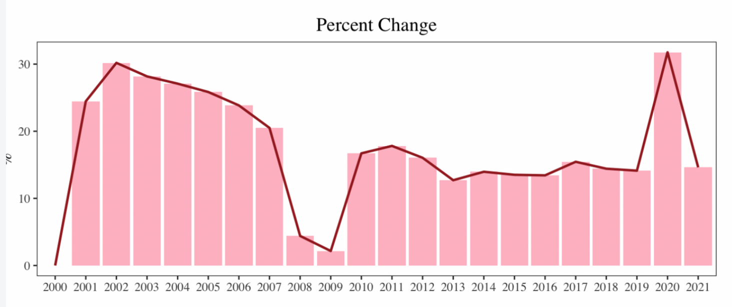

Rates & Fed Policy
All items in US City avarage, 2000-2022
Percent
financial crisis
covid
Measure
Inflation Rate
Interest Rate
Unemployment Rate

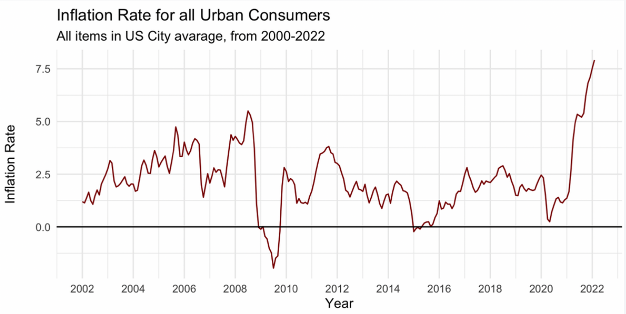

% Change in Real Personal Consumption Expenditures by US States
2019-2020
% Change
Lower than -4.8%
-4.8% to -3.2%
-3.2% to -2.1%
-2.1% to 0%
Positive Growth

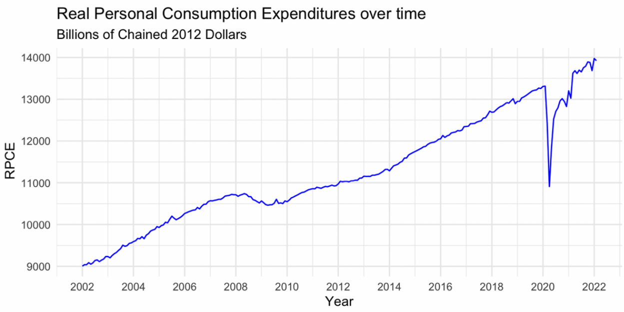

US Inflation by Product
Year-to-year (1947-2022)
Million Dollar
Date
Group
Airline Fares
Apparel
Energy
Food & Bevarages
Medical Care
Shelter
Used Cars

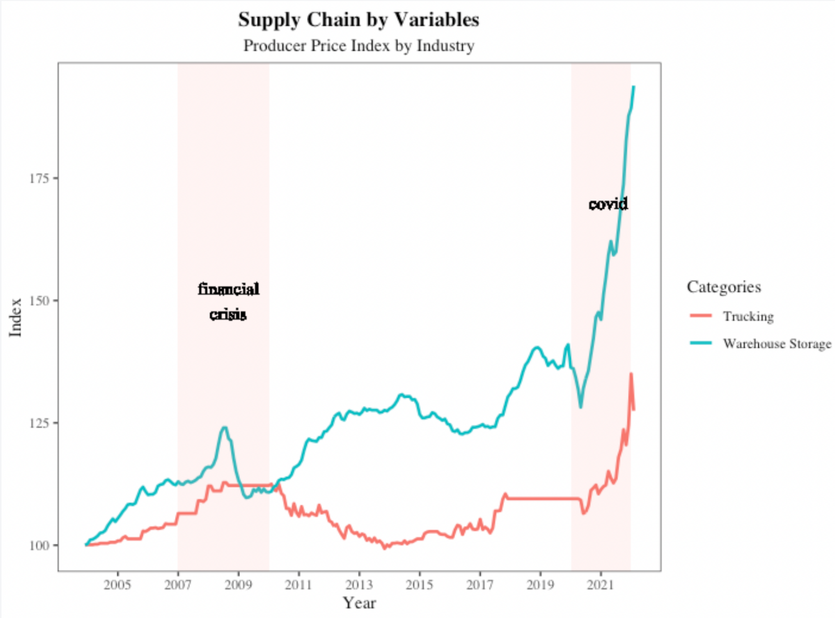

Contribution to Inflation by Sector
2020-2022
Medical Care
Shelter
Food & Bevarages
Energy
Airline Fares
Used Cars
Apparel
Percent (%)


US Retail Ecommerce
Million Dollar


Percent Change


Inflation Rate for all Urban Consumers
All items in US City avarage, from 2000-2022
Inflation Rate
Year


Real Personal Consumption Expenditures over time
Billions of Chained 2012 Dollars
RPCE
Year


Supply Chain by Variables
Producer Price Index by Industry
Index
financial crisis
covid
Year
Categories
Trucking
Warehouse Storage