Fall 5-1-2024

Analyzing the impact of COVID-19 driven inflation on customer personal consumption in the US

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This thesis is submitted in partial fulfillment of the requirements for the course Senior Seminar (EC 375), during the Spring Semester of 2024

While writing this thesis, I have not witnessed any wrongdoing, nor have I personally violated any conditions of the Skidmore College Honor Code.

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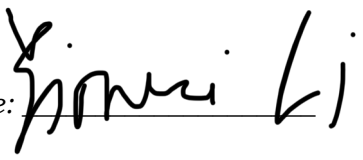
Signature: 

Abstract:

This paper focuses on the different effects of COVID-19-driven inflation on U.S. consumer spending on food, durable goods, and nondurable goods. The study used regression models to analyze changes in personal consumption spending on three categories between 2010-2017 and 2018-2024. The article emphasized that the economic instability caused by the pandemic and the fiscal policies utilized by the government have contributed to consumer behavior to a certain extent. The survey results show that the impact of inflation on food and non-durable goods spending is very clear: consumption on non-durable goods and food has increased. This may be due to increased health awareness and the demand for disposable household items. At the same time, spending on durable goods fell as consumers became more uncertain about the economic outlook. The study notes that the primary role of government interventions, such as fiscal stimulus measures, is to curb some of the negative economic effects by preserving consumers' purchasing power. Therefore, this means that the policies in the study have a legitimate use for adequately describing market reactions and consumer behavior in global crises, enabling them to inform policymakers and consumers alike. At the same time, the study also presents the need for flexible economic strategies to support effective recovery and resilience to make a greater contribution to society.

Introduction:

The COVID-19 pandemic, which has lasted nearly four years, has had a widespread and negative impact on society. The most obvious effect is that COVID has caused significant economic disruption, as reflected in the level of price volatility in the Consumer Price Index (CPI) and Producer Price Index (PPI) (Graph 1). These fluctuations raise the key question of their differential impact on US personal consumption expenditures for different categories of goods, such as food, durable goods, and non-durable goods. This study aims to reveal the extent to which COVID-19-driven inflation is affecting consumer spending behavior, which is critical for designing effective economic policies to mitigate adverse consequences and to provide some insights for consumers to better plan their budgets and utilize better methods to avoid negative impacts on their lives.

The economic consequences of the COVID-19 pandemic also led to a rapidly growing body of literature focusing on various aspects of the pandemic, including supply chain disruptions, consumer behaviors, and policy responses. For example, Akbulaev et al. (2020) highlight its dramatic impact on global supply chains and overall economic sectors, first mentioning major impacts on the services and import sectors, and then on consumer behavior. Thus, Comin et al. (2023) investigated how supply chain constraints during the pandemic increased inflation and altered consumer spending, particularly on nondurable goods. However, both studies capture the complex interplay between consumer behavior, market responses, and macroeconomic policy that is needed to understand this dynamic and formulate effective economic policy.

The purpose of my paper is to explore how COVID-19-driven inflation differentially affects the consumer's personal consumption expenditures for food, durable goods, and nondurable goods in the United States. This research interest was also spurred by the substantial drops observed in the personal consumption of these three goods, highlighted in Graph 2. Also, many people’s daily lives were affected by the pandemic: unemployment, low income, and a lack of necessities. To prevent similar circumstances that may have negative impacts on people in the future, I want to investigate more about this research question.

The study provides a clear analysis of the economic literature on how the inflation of the COVID-19 pandemic is having a different impact on several types of consumer goods. The uniqueness of this paper is that I divide consumer spending into three categories to help people better see the specific changes through comparing the

data from 2010–2017 and 2018–2024. The study also provided a new database that combines monthly data from several economic indicators, which helped me get a more complete picture of how the pandemic is affecting consumer spending.

Preliminary results suggest that the level of inflation is having a different impact on consumer spending, as spending on non-durable goods such as food and hygiene items is rising, due to increased health awareness and a surge in COVID-19 cases. In contrast, spending on durable goods slowed, reflecting increased economic uncertainty. These results underscore the importance of well-targeted economic policies to stabilize the economy and support successful recovery strategies, considering the disparate impacts on different consumption sectors.

This paper is divided into five parts. Section 2 will summarize the literature reviewed, which examined previous studies that considered the economic impact of the COVID-19 pandemic and its associated effects on consumer behavior and inflation. Section 3 is going to present the economic models used in this study, in particular the various variables, data sources, and econometric methods used to examine the differential effects of COVID-19-driven inflation on consumer spending on food, durable goods, and non-durable goods. Section 4 may discusse the scope and limitations of this study and indicates areas that need to be refined and further studied in the future. It should be a section that points out potential improvements that could make the findings stronger or take the research in new and informative directions. Lastly, section 5 will be the conclusion to sum up the whole article.

Literature Review：

In the literature review part, I will first focus on one article that talks about the basic background of inflation during the pandemic. Then, I will analyze some articles that talk about the impact caused by COVID-19 on the supply chain of some commodities like food and luxuries. Furthermore, I will analyze the consumer behavior change and policies implemented by the government to help me better understand what change was caused by COVID from a more professional level. In the end, I will talk about some articles that introduced the unemployment rate during the pandemic to help me analyze the change of one of my variables (Unemployment Rate) in my regression model deeply.

Firstly, I read some articles that were talking about the impact on people’s daily lives. As people witnessed, the impact of COVID on people's lives is multifaceted and significant. Everything from income to consumer preferences has been significantly

affected. At the macro level, the global economy also experienced a recession due to Covid. Akbulaev, N., Mammadov, I., & Aliyev, V. (2020) published the article Economic Impact of Covid-19 and provided an overall background for me to start my literature review.

This article provides a one-sided view of the impact of the COVID-19 pandemic on different sectors that affect the world economy. The article reviewed the impact response has created on lockdowns and social restrictions that have resulted in massive losses for the services sector, especially retail hospitality entertainment transportation. A fall in the demand by consumers has resulted in a decrease in imports, especially within the EU and the US, which affects developing countries that use exports. The economic consequence is more devastating to countries that depend largely on tourism.

In addition, electronics production and supply chains were also mentioned in the article. For instance, the temporary shutdown of Foxconn and Samsung factories creates shortages of basic electronic components. The problem of unemployment is a worldwide phenomenon because companies close or retrench workers. Governments across the globe have taken various steps to offer support to unemployed people, small business owners, and other businesses struggling with losses from the coronavirus pandemic. Even worse, the export sector has also been affected as some countries have stopped their exports, especially grains. Imports have also been hit, and several areas stopped importing a particular commodity (Akbulaev et al., 2020). As a result, this provides me with a prediction that the food industries and peoples' daily necessities were impacted by COVID-19 significantly.

Given these disruptions in supply chains, this study anticipates that similar patterns will be observed in the food, durable, and nondurable goods sectors. Particularly, shortages and delays in production could lead to increased prices for these goods, reflecting on consumer expenditures. The substantial impact on electronic components and food supplies suggests a potential rise in the prices of related durable and nondurable goods, which could reshape consumer spending patterns significantly. These expectations guide the current research, aiming to explore and quantify how these changes in supply chains during the pandemic have differentially affected the prices and consumption expenditures across these essential categories. This approach will provide a deeper understanding of the pandemic's economic impact, informing more targeted economic recovery strategies.

As I mentioned above, the spread of Covid-19 has led to severe impacts on global

supply chains, such as Samsung and Foxconn. In the topic I am discussing, I argue that inflation has also been affected by changes in the supply chain. These impacts also directly affect the changes in supply and demand when consumers buy foods, durable goods, and non-durable goods.

Comin, Johnson, and Jones presented a new Keynesian model in a recent study to examine the relationship between supply chain limits and inflations. Through considering several sectors and states, researchers can view in terms of domestic and foreign constraints of capacity how prices evolve. According to the authors, the study revealed that whenever a producer is constrained by capacity the prices shoot up and the phenomena also take place both in domestic and international markets. This is a Phillips curve effect akin to an upward shift in the Phillips curve due to a market price shock; the essence of the Phillips curve is that capacity is constrained, and prices rise faster than they otherwise would from supply and demand.

Therefore, as the researchers demonstrate using a model of inflation for the United States between 2021 and 2022, budgetary constraint is responsible for about half of the evolution of inflation over this period. Notably in 2021 under the influence of a monetary policy eased, the already tight capacity constraints have further contributed to inflationary pressures. This highlights the need for the consideration of the supply chain when setting monetary policy.

Furthermore, the study identifies that the information about the price and quantity can determine whether production capacity constraints are from demand increases or reductions in supply. This is of considerable importance for policymakers since it will more precisely identify the causes influencing the economy and adopt more appropriate policies to control inflation. Altogether, the suggested research offers an adequate framework for how restraints on the supply chain propagate in a systemized economic setting and affect stability (Comin et al., 2023).

The supply chain of the fashion industry is also severely pressured. Research conducted by the Italian cashmere supply chain in the context of the COVID-19 pandemic is an illustration of how parties in a supply chain respond to dependence on the use of power and the effect their actions have on their perceptions of justice. The study reveals two types of dependence: process characteristics lead to buyer dependence while characteristics of market position lead to supplier dependence. At the same time, the authors identify four typical models of coping with the dynamics of dependence, power, and justice: restraining, limiting, relational, and elastic.

The buyer sees the dependency on the part of the supplier and practices the

intermediary power only by way of the coercive strategy, which leads the supplier to the perception of an unfair interaction, procedure, and distribution, the buyer is attacked by the reciprocal coercive strategy. In the restrictive one, the buyer knows it is dependent on the supplier and has intermediary power through the contract, while the supplier experiences unfair distribution and creates plans to go through the branded product. With the relational type, the buyer is already aware of the buyer's dependence due to the nature of the process but through cooperation, the supplier does not yet feel the distributive justice because business security is still a demand and there are no future orders. In the case of the elastic, the buyer is sensitive to the dependence created by its process itself and utilizes a combination of intermediary and non-intermediary power through the sustainable order to the supplier, which makes the supplier positively perceive every type of justice.

With the profits plummeting to a staggering 93% in 2020, the Covid-19 crisis has immensely affected the fashion industry. This economic stress is shifted to tier-I and lower-tier suppliers, with enormous social and economic implications. In terms of the global luxury industry, the greatest country is Italy, which consumes 7.4% of the GDP of the country and has over 79, 000 crafts SMEs. In this case, during the crisis, even the leading luxury brands could not guarantee the flexibility of their supply networks (Karaosman et al., 2023).

The COVID-19 pandemic has been nothing short of cataclysmic in its effect on the world's food supply chain, specifically on food security in Canada and the United States. The pandemic brought many hurdles in the food industry, including production interruptions, delays in logistics, transportation and changed market demand unclear to food quality and safety. People may experience that the price of food like eggs, milk, or meat increased significantly during the most severe time. Furthermore, the pandemic has contributed not only to food scarcity but also enhanced food insecurity, especially among low-income families. For instance, in the United States, almost 70 percent of families lost their jobs or income as reported (Omotayo & Ngwenyama, 2022). As a result, people were "forced" to change their behaviors when they were faced with the high price of food and necessities and the low supply of these commodities.

During the pandemic, consumers' shopping behavior experienced substantial changes, in response to price rises and falling purchasing power. The COVID-19 pandemic comes to the rescue to make this even more apparent, exacerbating inflationary pressure, and changing the way consumers shop.

Rose, Rowe, and Dolega studied changes in consumer behavior due to COVID-19 in their research. The study findings indicate that during inflationary periods the tendency for consumers to reduce their purchases of non-essential items, and instead focus on purchasing necessities, increases. The sales data from companies like Wal-Mart shows that sales of basic products, for example, groceries and hygiene products, went up during the pandemic. This reason may be because the consumers were just preparing for future hikes in prices or uncertainty of goods supply forcing them to be buyers (Rose et al., 2023).

As a result, consumers changed their shopping frequency. The idea of reducing the number of trips out and saving money makes people purchase more items at once. This trend can be seen in Walmart's data as well, where the transaction amount has gone up while the number of transactions has decreased. Also, the pandemic has sparked the incredible growth of e-commerce. There was a shift of many consumers to online commerce due to brick-and-mortar store closures and personal safety concerns. Retailers like Walmart adapted to this trend by upgrading their online services and branches and this managed to keep their sales level.

Individual analysis reveals that price fluctuations under inflation brought about two challenges for retailers. Regarding supply chain management, retailers should see to it that the inventories are enough to cover the high rush of consumers for basic goods. Besides that, price strategy, finding a balance between increasing costs and keeping product prices competitive. Further, it could widen the inequalities in the retail industry as certain sectors may not be able to adapt as fast as other sectors. The other observation by the authors is that the online shopping surge during the pandemic was primarily associated with a rise in transaction numbers rather than a rise in consumer purchasing capacity.

From a macro perspective, the behavior of Walmart and other large retailers may become a sign of the future of retailing during the pandemic. With the increasing trust in online shopping and the decreasing reliance on brick-and-mortar stores, retailers are required to consider again the proportion between their brick-and-mortar stores and online services.

Besides only analyzing real cases, Davor, Zrinka, and Nikolina conducted one more study, a survey that applied to 200 respondents and aimed to compare consumer behavior before and after inflation. The study reveals that inflation causes consumers to reallocate their purchases depending on their priorities or even needs in other words, consumers spend more on essential goods such as food and fuel while they

spend less on non-essentials such as clothing and entertainment.

In Croatia, the reasons behind inflation were established to be the war in Ukraine, the pandemic, and the Euro currency. The above factors drove the psychological state of the consumers to change, and they shifted to feeling insecure about the rising cost of living. Consequently, the consumers had to adapt by looking for cheaper substitutes or by reducing their consumption.

The study's method was a survey being disseminated through Google Forms, concentrating on adults who have or have ever been employed. The survey collects data from socio-demographics and changes in spending behaviors. The results revealed that whereas the expenditure on food and utilities went up, the expenditure on clothing and entertainment declined strikingly. These results imply that when consumers are under financial pressure, they first have their basic needs met and then save on non-essential or luxury items (Davor et al., 2023).

From my perspective, the study highlights consumers' resilience and adaptability in the face of economic challenges. It also emphasizes the necessity for companies to comprehend these behavioral shifts to be able to create effective marketing strategies. Swift variations in purchasing preferences by consumers manifest a more significant economic effect which is that the demand for certain products can be substantially influenced by extraneous forces such as inflation.

As a result, inflation is a huge determinant of consumer behavior leading to changes in shopping patterns in favor of necessities against business as usual. Such responsive conduct lies at the core of the firm's strategy to guide and sustain its appeal to consumers amidst times of economic instability.

During the pandemic, changes in consumer behavior were driven by two main factors: the decrease in commodity supply and income, and the implementation of government policies aimed at mitigating the economic fallout. Over the past years, governments and central banks have deployed various macroeconomic policies to cushion the economy and currency exchange rates from the adverse effects of the COVID-19 pandemic. The article by Zhou and Hang has deepened my understanding of these policies, highlighting their advantages, disadvantages, and underlying reasons.

Fiscal policy, primarily comprising government spending and tax adjustments, played a pivotal role. For example, Australia announced an economic stimulus package of A$66 billion, while Brazil allocated R$147.3 billion to protect jobs and

support various industry sectors and disadvantaged groups. From my perspective, these measures were crucial for facilitating financial flows, stimulating economic activities, preserving employment, and preventing business failures. However, these stimulus measures also have potential drawbacks, such as increased government debt, future tax hikes, and the possibility of inflation.

Given the broad implementation of these fiscal policies, a critical aspect to consider in my research is their inflationary impact. While designed to stabilize the economy, such expansive fiscal stimulus can also lead to price increases across the board, affecting food, durable goods, and nondurable goods alike. This inflationary pressure could exacerbate the already strained supply chains, further driving up prices of commodities as increased money supply chases limited goods. Thus, the question becomes how significantly these government interventions affect the prices of different categories of consumer goods during the pandemic. This issue forms a central part of my investigation, aiming to dissect the direct and indirect consequences of fiscal stimulus on consumer expenditures across these essential categories, and whether such policies inadvertently contribute to price inflation in the short and potentially long term.

Furthermore, the monetary policy is significant as well, which is altered using the interest rate and the money supply. Several countries with this approach have seen a reduction in interest rates to decrease people's loan amounts and stimulate investment and spending. As one illustration, nations including Mexico, New Zealand, and the Philippines have reduced interest rates by 25-100 basis points. Therefore, the impact of these measures is that they stimulate economic growth and curtail the outbreak's effects. Nevertheless, these policies may include the lessening of the value of the respective local currencies, which leads to the buying of safer assets or currencies by the funds.

In addition, some countries like Japan and the US applied some non-conventional monetary policies such as Quantitative Easing, which are additional sources of liquidity. Some of these policies have been shown to successfully revalue the local currency in the short term (Zhou et al., 2021). As a result, they seem to have positive markets for them. Also, non-traditional monetary policies may result in potential dangers to financial stability and rack up asset bubbles in the long run.

The results showed that the magnitude of COVID-19 is positively correlated to the currency's risk premium and future interest rate arbitrage in emerging countries. It implies that developing economies are more affected by the pandemic adverse

impacts during crisis periods. Then, compared to developed countries, the currency exchange rates of third countries are less influenced by COVID-19 in virtue of their more sophisticated financial systems and better variety of safe assets.

To sum up, different macroeconomic policies were the main tool in the COVID-19 pandemic response process. While such policies undoubtedly had their good sides, including supporting economic growth and ensuring the stability of financial markets they also fostered negative factors, such as increased government deficits, inflationary risks, and imbalances in amounts of different currencies. Thus, the policies should be weighed, their pros and cons estimated, and the particularities of a given country considered before their implementation.

As I mentioned before, the US utilized some non-conventional policies to help release some pressure on economics caused by the pandemic. In Herron and Manuel's' article, they analyzed the U.S. government policies. During Covid, the U.S. government launched several fiscal stimulus packages. For instance, the CARES Act. The government designed $2.2 trillion to provide direct economic assistance to individuals, businesses, and healthcare systems affected by the pandemic (Herron & Manuel, 2022).

The CARES Act consists of the following major provisions: firstly, the government had direct payments: one-time direct payments of up to $1,200 to eligible U.S. citizens. In addition, people could get unemployment benefits by adding $600 per week for four months to unemployment insurance. Furthermore, the government provided small business support: and created the Small Business Payment Protection Program (PPP), which provides loans to small businesses to maintain operations and pay employees, some of which can be forgiven if conditions are met. Moreover, the tax policy changes delayed tax filing and payment deadlines for individuals and businesses and provided tax credits for specific industries, such as the airline industry. Lastly, there was state and local government support: Funding was provided to help state and local governments with outbreak-related expenditures.

In addition, the U.S. Federal Reserve System (Fed) implemented a series of unconventional monetary policies, including lowering interest rates to near-zero levels and initiating an unlimited quantitative easing program.

The government has taken the following measures to maintain economic stability: firstly, lowering interest rates and reducing the federal funds rate to near-zero levels. Also, quantitative easing: an unlimited quantitative easing program was implemented to increase liquidity in the financial system by purchasing government bonds. Lastly,

liquidity support: Various loan facilities, such as the Money Market Mutual Fund Loan Facility and the Municipal Liquidity Loan Facility, were introduced to support financial markets and provide credit.

These policies have been proven they have positive effects on the economy in the short term. Since people got direct money and benefits from governments, they were able to afford their daily necessities during the pandemic. Furthermore, easing monetary policy ensured liquidity and stability in financial markets. However, these policies have also led to an increase in the country's fiscal deficit and may cause inflationary pressures in the future.

In the long run, the effective exit from these unconventional policies, balancing the budget, and controlling the level of debt will be the main macroeconomic policy challenge for the United States. In addition, the experience during the epidemic suggests that policymakers may need to be more refined in considering how to balance direct economic assistance with long-term fiscal sustainability in the face of similar crises in the future.

During the Pandemic, the Government responded with some strict social quarantine measures to prevent the spread of the virus, but there was a chain effect on the rate of inflation and the behavior of consumer spending. The social isolation policy impacted unemployment, which reduced the consumer’s disposable income and affected the pattern of consumer spending. People decreased the purchases of non-essentials such as luxuries, which was brought about by their falling incomes and the possible loss of future jobs as I mentioned previously. Consequently, reduced consumer spending aggravates the decline in economic activity which in turn reduces the production of goods and services and thus lowers the sales of the corporations, which results in a vicious cycle.

The primary objective of this paper is not to dissect the direct relationship between inflation and unemployment during the COVID-19 pandemic, but rather to examine how various government policies, including fiscal stimulus and social isolation measures, have impacted consumer spending patterns and economic activity. The analysis of unemployment trends serves to underline the broader economic effects of these policies and emphasizes the need for more effective and adaptive policy frameworks.

In the research of Dreger and Gros, they used detailed unemployment data for each state of the US and completed a panel model to examine the influence of the implementation of social segregation on the unemployment rate. The results

demonstrate that the unemployment rate increases in the first two to four weeks following the government's implementation or reinforcement of social isolation measures. This lag arises from firms' response to policy changes and the renegotiation of labor contracts. More importantly, the study finds an asymmetry in the change in the unemployment rate: the speed and the magnitude of the unemployment rate rise is more pronounced when the policy is tightened, rather than the slow decrease in the unemployment rate in the ease of measures. Such findings suggest that during economic recessions and uncertainty that lasts for a long period of time, firms are more prone to lay off workers to reduce overall costs.

The research finds that although a pandemic by itself can cause unemployment, the effect of social isolation measures is more pronounced. These policy responses, including the closures of schools and workplaces, have a direct impact on the labor supply that burdens the labor market. The asymmetric and persistent aspect of this impact calls for policymakers to be more cautious in their interventions to the market to avoid causing imbalances in the market.

The article additionally stresses the necessity of governments to reconcile outbreak control and economic activity during public health emergencies. Policymakers should bear in mind the effects of social isolation measures' effects on the labor market when adopting such measures and consider unemployment rates lagging the policy changes. Hence, to diminish the negative effect of social segregation measures on the job market, governments must create policy instruments more flexible and adaptive. Likewise, targeted financial assistance to the most affected industries and workers could be provided, or targeted training programs could be set up for the jobless to regain employment (Dreger & Gros, 2021).

Different ways of government’s decision-making actions can also exert different effects on the unemployment rate during the pandemic. Through the research of unemployment rates in the United States and Europe, the labor markets in the US and Europe demonstrated different responses. In the U.S., unemployment rates varied greatly and rapidly over each state.in March and April 2020, the unemployment rate increased sharply and after that has been recovering gradually (Graph 3). On the contrary, in Europe, unemployment rose at a smaller rate and the adjustment process was slower (Graph 4).

This might be the reason behind the contrasting response to the same rate of unemployment in the United States and Europe which could partly be because of the rampant use of short-term work programs that cushioned the unemployment rate

despite the similar reduction in overall hours just like in the United States. Econometric studies, involving data from U.S. states and EU member states indicate that the U.S. Covid-19 pandemic was driven by the overall shock which started in March 2020 and lasted until November 2020. In the EU only a minor change in unemployment rate suggests a rather isolated labor market reaction to the crisis.

It is noted that despite a major recession, European labor markets have revealed unexpected resilience. A steep decline in GDP in the second quarter of 2020, however, was followed by a relatively small drop in employment and later a recovery in the third quarter. This resilience, in turn, is due to short-term work tools facilitating the workers to keep their jobs but work fewer hours over time. They protect the labor market from severe output fluctuations that occur in the United States and the EU (Policy Studies et al., 2021).

To sum up, despite the significant economic disruptions caused by the COVID-19 pandemic globally, the labor market responses in the U.S. and Europe were different. The U.S. experienced more severe and rapid changes in unemployment rates, while Europe's labor markets were more stable, in part due to protective labor policies such as short-term work programs. As a result, this also illustrates that understanding these differences is significant for policymakers when designing interventions to mitigate the employment impact of such crises.

Among all these articles, most of them mentioned that there were some impacts on peoples' consumption in purchasing food, durable goods, and non-durables. However, they did not have clear instructions for people to get to know how much of the consumptions of these products were impacted by the pandemic during the inflation. As a result, I want to use the regression model to help me find the data like when inflation increases, and what percentage of consumers' demand may change. Furthermore, this could also help me provide more evidence to analyze how people or government could react better in the future when faced with similar situations.

Analytical Framework:

After a deep analysis of previous studies during the pandemic, I found a series of data that changed during the two different periods, and these changes provided me with significant guidance in choosing the variables to include in my regression model. Therefore, I decided to use the Inflation Rate, Unemployment Rate, Personal Saving Rate, Producer Price Index (PPI), and Interest Rate as independent variables to explore how they affect consumer spending on durable goods, food, and non-durable goods. Initially, I also considered adding some variables such as CPI, GDP, and Loan,

but after I used the Robustness Check, I realized that these variables were highly correlated with the previous variables, so I decided to use the previous five independent variables to help me get the conclusion more efficiently.

Firstly, the reason I chose the inflation rate is because it directly reflects the growth rate of the total price level of goods and services and is a direct indicator of the decline in purchasing power. Akbulaev et al. (2020) showed that the inflation rate fluctuated significantly during the epidemic due to supply chain disruption, changes in consumer demand, and implementation of government policies. This volatility has a direct impact on consumers' ability to purchase goods and services, particularly durable goods that are considered non-essential and whose consumption may be more affected.

Secondly, the rising unemployment rate means that more people have lost a steady source of income, which directly affects their purchasing power. According to Comin et al. (2023), many industries faced layoffs and closures during the pandemic, leading to a significant increase in unemployment. Therefore, the analysis of the unemployment rate can help us better understand how the epidemic changes the consumption of different goods by affecting the employment situation.

Furthermore, the Personal Saving Rate reflects the ratio of personal savings to their income. In previous studies, the saving rate was an important indicator for assessing consumer behavior under economic uncertainty. Karaosman et al. (2023) show that under increased economic uncertainty, individuals may increase their savings to cope with future uncertainty, which may reduce their consumption of non-essential goods, including certain durable and nondurable goods.

Moreover, the Producer Price Index (PPI) provides information on changes in the prices of goods during the production phase, so, this can be used as a harbinger of future changes in the prices of consumer goods. Increases in production costs may be passed on to consumers, thus affecting their consumption decisions.

Finally, the interest rate (Interest Rate) may affect the cost of borrowing and willingness to save, which in turn affects the consumer's ability to spend. In a study by Dreger and Gros (2021), they note that changes in interest rates can significantly affect consumers' willingness to purchase durable goods, which usually require a loan to purchase.

Therefore, after considering these economic indicators together, my study aims to gain a deeper understanding of how changes in the economic environment during the

pandemic affected consumers' consumption behavior of durable, food, and nondurable goods. The selection of these variables is based on their importance in economic theory and their actual changes and impacts in the current global economic environment. As a result, my initial Regression Model is the following:

$$Consumption_t=\beta_0+\beta_1 inf_t+\beta_2 unem_t+\beta_3 saving_t+\beta 4 ppi_t+\beta_5 interest_t+\beta_5 quar*_t+\epsilon_t$$

In this model, consumption represents consumer spending on durable goods, food, and nondurable goods, and t represents time. Through this model, I hope to reveal how consumer spending on these three categories changed during the pandemic as the economic environment changed.

To gain a better understanding of the changes in consumer behavior before and after the pandemic, I am going to compare the differences in individual consumption expenditures on the three categories of durable goods, food, and nondurable goods between 2010-2017 and 2018-2024. Also, I consider the introduction of quarterly variables (q1, q2, q3, q4) to the analysis, which represent the four quarters of the year. By including these quarterly variables in the model, I can explore consumers' consumption patterns and their changes in different seasons in more detail. The impact of seasonal factors on consumer behavior cannot be ignored; for example, holidays may boost consumer spending in certain categories, while seasonal changes may affect food and clothing purchases. At the same time, changes in consumer behavior may be more pronounced in quarters with more COVID cases being detected. Therefore, the introduction of quarterly variables not only helps us to identify and understand seasonal fluctuations in consumer spending but also offers the possibility of analyzing the seasonal impact of the pandemic on consumption patterns.

All my data came from two main sources, the first is from FRED and the second is from the official government website. Table 1 and 2 shows the summary of the data during two different periods.

Data Analysis:

1. Food

In the column of data about food in Tables 3 and 4, I could effectively analyze the results of regression models of food consumption expenditure for 2010-2017 and 2018-2024. The significant statistical changes reveal the complexity of the impact of the pandemic on consumer behavior. In particular, the changes in the Inflation Rate and the Unemployment Rate provide more effective evidence for me to solve research questions.

The positive effect of the Inflation Rate on consumer food expenditure (coefficient of 19.61, $p<0.05$) over the period 2010-2017 may reflect the fact that slight price increases during periods of economic growth have not weakened consumers' purchasing power. However, the inflation rate has a negative effect on food consumption expenditure during 2018-2024 (coefficient -82.74, $P<0.01$). This highlights the impact of rising prices during the pandemic on consumers' purchasing power (Mendez-Carbajo, n.d.). From my perspective, this shift may reflect price volatility resulting from supply chain disruptions and increased global economic uncertainty, as well as consumer concerns about future economic prospects (NBER, n.d.). This is also shown in the personal saving rate. The impact of the Saving Rate shows different trends in the two periods. During the period 2010-2017, the impact of the Personal Saving Rate on food consumption expenditure is insignificant (coefficient of 0.01, $p=0.194$) while the positive impact of the Personal Saving Rate becomes significant during the period 2018-2024 (coefficient of 0.03, $p=0.020$). This suggests that during the pandemic, as economic uncertainty increases, consumers may tend to increase their savings but also maintain or increase their spending on necessities, such as food. This phenomenon may reflect the fact that consumers, in the face of uncertainty about the future economic outlook, maintained their investments in necessities despite increasing their savings to cope with potential economic risks.

In addition, the unemployment rate had a significant negative impact on food consumption expenditures over the 2010-2017 period (coefficient of -40.53, p close to 0.000), which is in line with the economic theory that rising unemployment leads to a decrease in household income, which in turn reduces consumption (Dreger & Gros, 2021). However, the effect of unemployment on food consumption becomes positive during 2018-2024 (coefficient of 12.27, $p<0.05$), a change that may reflect the buffering effect of the government's fiscal stimulus measures, such as increased unemployment benefits temporarily mitigating the direct impact of unemployment on households' ability to consume.

The positive impact of the producer price index (PPI) on food consumption is significantly stronger in the latter period (coefficient of 6.57, p close to 0.000), suggesting that the rise in production costs during the pandemic had a significant positive push on food prices and consumer spending. This is consistent with the observation of rising costs due to supply chain disruptions and their impact on consumer prices (Government of Canada, 2022).

Furthermore, the quarterly variable provides a window of insight into seasonal

changes in consumer behavior during the pandemic. In particular, the significant decline in food consumption expenditures in the second quarter (coefficient of -37.20, $p<0.05$) over the period 2018-2024 may be related to the closure measures implemented during the initial outbreak of the pandemic, which limited people's access to the outside world and impacted consumers' spending habits and capabilities (*USDA ERS - Food Spending Shifted in Response to Pandemic; Changes for Food Away From Home Continued Through 2022*, n.d.).

Finally, the interest rate (Interest Rate) had a non-significant effect on food consumption expenditure over the period 2010-2017 (coefficient of -0.58, $p=0.600$), which may reflect the fact that during periods of economic stabilization, changes in the interest rate have less of a direct impact on consumers' daily consumption decisions. However, during the period 2018-2024, although the effect of interest rates on food consumption remains insignificant (coefficient of 4.95, $p=0.063$), the positive change in the coefficient may suggest that fiscal stimulus in a low-interest rate environment may have supported consumers' spending power to some extent during the epidemic period, when there was a high level of economic uncertainty, albeit the effect of this support was not very significant.

Overall, price increases during the Covid, especially the rapid increase in food prices, directly weakened consumers' purchasing power. However, the government's fiscal stimulus, particularly its support for unemployed individuals, played a key role in mitigating this effect. This suggests that in similar global crises in the future, active government fiscal policies will be crucial to maintain and enhance consumers' purchasing power, especially for necessities such as food.

2. Durable Goods

In Tables 3 and 4, which showed the two periods of durable goods, the impact of the inflation rate changed significantly. During the period 2010-2017, the inflation rate showed a positive impact on the consumption of durable goods (coefficient of 33.63, $p=0.027$). This might be associated with consumer confidence in the context of economic growth (Akbulaev et al., 2020). However, the positive impact of the inflation rate on the consumption of durable goods is significantly stronger during the period 2018-2024 (coefficient of 175.52, $p=0.030$). This reflects the increased consumer demand for specific durable goods (e.g., home office equipment) during the pandemic even though consumers are facing price increases (Comin et al., 2023).

The change in the Producer Price Index (PPI) between the two periods is also essential to analyze in my opinion. Before the pandemic, the PPI had a slight negative

effect on the consumption of durable goods (coefficient of -1.07, p=0.011), while during the epidemic, the positive effect of the PPI was significant (coefficient of 9.22, p<0.001), which may point to rising costs due to disruptions in the supply chain, as well as sustained consumer demand for durable goods, especially for necessities of life and work (Karaosman et al., 2023). Secondly, unemployment had a significant negative impact on durable goods consumption before the epidemic (coefficient of -68.26, p close to 0.000), while this effect was weakened but still present during the epidemic (coefficient of 13.66, p=0.331), which may reflect the limited effect of the government's fiscal stimulus measures in mitigating the impact of unemployment(Dreger & Gros, 2021).

One of the noticeable points is the increase in consumer spending on durable goods in the fourth quarter (coefficient of 46.86, p=0.265) which may point to year-end purchasing behavior by consumers. While this change is not statistically significant, it hints at increased consumer demand for durable goods during the holiday season, despite inflationary pressures. This phenomenon may be related to holiday promotions, year-end bonus payments, and consumers' psychological expectations about meeting year-end needs for families and individuals.

In addition, the significant decline in consumer spending on durable goods in the second quarter (coefficient of -48.91, p=0.263) reflects the direct impact of the embargo measures at the beginning of the epidemic. The decline in consumption during this period could be related to consumers' uncertainty about the economic outlook and concerns about their financial situation. However, it could also imply a recovery in consumer demand for durable goods over time, especially in the fourth quarter, following the gradual liberalization of the economy and the implementation of government stimulus measures.

Finally, the analysis of interest rates and personal savings rates sheds light on consumers' financial behavior in the face of economic uncertainty. Although the effect of interest rate on durable goods consumption is insignificant in both periods, the positive effect of personal savings rate on durable goods consumption becomes significant during the epidemic (coefficient of 0.06, p=0.040), which may indicate that consumers preferred to save during the epidemic while also maintaining or increasing their spending on essential durable goods.

To sum up, the model shows that COVID-19-induced inflation significantly enhances the positive impact on consumer spending on durable goods during 2018-2024. This finding may reflect increased consumer demand for specific durable goods

during the epidemic, such as home office and recreational equipment, to accommodate home-based work and isolated lifestyles. Meanwhile, the significant positive change in the Producer Price Index (PPI) underscores that strong demand for certain durable goods was not dampened, even in the face of rising costs. These results reveal the complex impact of the epidemic on consumer behavior for durable goods and highlight the need to consider the long-term effects of the epidemic on consumer preferences and consumption patterns in future economic policies and market strategies.

3. Nondurable Goods

In the two tables below about nondurable goods, inflation had a positive impact on consumer spending on nondurable goods (coefficient of 44.53, p=0.015) over the 2010-2017 period, which may reflect stable consumer demand for nondurable goods in the context of economic growth. However, by 2018-2024, the effect of inflation becomes insignificant (coefficient of -40.26, P=0.582), which suggests that the impact of inflation on non-durable goods consumption during the epidemic period may have weakened due to consumers' budgetary constraints and reduced purchasing power.

Secondly, the PPI shows a positive impact on non-durable goods consumption in both periods, especially in the period 2018-2024, where its impact is significantly stronger (coefficient of 16.30, P<0.001). This reflects the surge in demand for certain non-durable goods (e.g., hygiene and food) during the epidemic, and the strong willingness of consumers to buy even in the face of rising prices.

Unemployment had a significant negative impact on the consumption of non-durable goods over the period 2010-2017 (coefficient of -88.46, p<0.000), which is in line with the economic theory that rising unemployment leads to a reduction in household income, which turn reduces the consumption of non-essential goods (Dreger & Gros, 2021). However, the negative impact of unemployment on the consumption of non-durable goods remains over the period 2018-2024 (coefficient of 3.48, p=0.788), although the impact of unemployment has weakened, which may reflect the fact that the negative impact of rising unemployment on consumer confidence and purchasing power remains significant despite the presence of the government's fiscal stimulus measures.

Interest rates have a positive impact on consumption of nondurable goods over the period 2018-2024 (coefficient of 16.95, p=0.008), which may indicate that cheaper loans in a low-interest-rate environment boosted consumer spending on certain nondurable goods, although this effect was not significant over the period 2010-2017

(Karaosman et al., 2023). The personal savings rate also shows a positive effect on nondurable goods consumption over the 2018-2024 period (coefficient of 0.05, p=0.049), which may reflect the fact that during epidemics with high economic uncertainty, demand for certain nondurable goods is maintained or increased despite consumers' increased savings, especially for goods that improve the quality of life at home.

In summary, COVID-19-induced inflation and its associated economic fluctuations had a complex impact on U.S. consumer spending on nondurable goods over time. Although the direct impact of inflation rates on nondurable consumption diminished during the epidemic, increases in the PPI and changes in seasonal shopping habits continued to boost consumption of specific nondurable goods. These findings underscore the need to consider the specific needs of nondurable goods markets and seasonal changes in consumer behavior when developing economic recovery strategies to support economic growth and consumer well-being more effectively.

4. Dummy Variable Added

After analyzing the changes in the data over the two periods, to analyze the impact of the COVID-19 pandemic more accurately on U.S. consumer food expenditures, I considered introducing a new dummy variable into the regression model to further aid in my analysis. This dummy variable is designed to be set to 0 for the period 2020 and before, and 1 for the period after 2020. The main purpose of this setup is to capture the structural changes that may be brought about by the COVID-19 pandemic so that I can directly assess the impact of the pandemic on consumption behavior. In this way, I can compare the data before and after the pandemic and clarify how the pandemic has changed consumer behavior in terms of food expenditures. In addition, the coefficient of this variable will directly show whether there was a significant change in consumer food expenditures after the start of the pandemic compared to the pre-pandemic period, and the magnitude of this change. The second model becomes:

$$Consumption_t=\beta_0+\beta_1 inf_t+\beta_2 unem_t+\beta_3 saving_t+\beta 4 ppi_t+\beta_5 interest_t+\beta_5 quar^*_t+dum+\epsilon_{it}$$

Thus, this newly added dummy variable not only enhances the explanatory power of the model but also provides an important empirical basis for understanding and analyzing the impact of current and probable future similar public health crises on economic consumption. Through this approach, this study aims to provide deeper insights to help policymakers, companies, and consumers better understand and cope

with the economic consequences of public health emergencies.

According to Table 5, the highly significant coefficient of the dummy variable dum can be seen in the table for food (coefficient of 232.5969, p-value close to 0), which suggests that after the start of the COVID-19 pandemic (2020 and beyond), food expenditures significantly increase by about 233 units compared to the pre-pandemic period. This result strongly supports our purpose of introducing the dummy variable, which is to visualize the impact of the pandemic on consumer spending behavior.

In addition, the coefficient of the dummy variable dum on durable goods, 460.8544, is highly significant. This figure indicates a significant increase in the consumption of durable goods since the beginning of the COVID-19 pandemic. This may be in line with the reasons given in the previous modal analysis: the increase in demand for durable goods related to home office and distance learning, such as computers and office furniture.

As with the previous two variables, the coefficient on the dummy variable for nondurable goods also remains significant at 476, which helps to explain the increased demand for household necessities such as paper and hygiene products during the COVID period.

Thus, through introducing dummy variables for the COVID-19 period, I not only confirm the profound impact of the economic environment on consumer behavior before and after the pandemic, but I am also able to quantify this impact more precisely. The significant positive coefficients on the dummy variables underscore the significant boost that pandemics have on the consumption of various goods, a result that not only validates the findings of the model for the previous period but also highlights the adaptive changes in consumer behavior in the unique economic environment of a pandemic. This analysis deepens my understanding of economic policy and market responses in the context of public health crises and provides valuable insight into similar challenges that may be encountered in the future.

In addition to the direct impacts outlined, it is crucial to explore the indirect effects of the COVID-19 pandemic on consumer spending across different sectors. For example, increases in spending on food and durable goods suggest that the pandemic may cause lifestyle changes in consumer spending. Many people's attention turns to improving the home space, getting a home entertainment system, and getting used to a family-centered life. Some of these changes could signal a long-term shift in consumer priorities after the pandemic.

Furthermore, dummy variables were statistically significant across different classes of goods, meaning there were differences in several sectors among the different sectors affected by the pandemic. The increase in demand from some other industries to other industries, especially those related to services and tourism, saw a significant drop in demand. Thus, in this bifurcation of consumer spending, a clear articulation of targeted economic policies is essential to meet the specific needs of a balanced economic recovery that each sector may require.

On the other hand, it may reinforce some trends that have been developing in the past, such as the shift of buying to e-commerce and digital consumption. This shift is having a fundamental impact on retail and consumer goods distribution channels. If the pandemic and its lasting impact on society solidify new consumer behaviors, retailers and manufacturers must adapt to these emerging trends or risk becoming obsolete. As consumers increasingly favor online shopping, companies will need to enhance their digital platforms, optimize their supply chains for e-commerce, and innovate in their product delivery systems. Furthermore, brands may need to develop more direct-to-consumer strategies and personalized marketing approaches to engage effectively with this digitally inclined audience.

Moreover, the emphasis on sustainability and ethical consumption, which has been accentuated by the pandemic, might further drive changes in consumer expectations and behaviors. Retailers and manufacturers will need to transparently demonstrate their commitment to environmental and social responsibility, potentially reshaping their operations to meet these values.

Thus, the business landscape post-pandemic is poised for a significant transformation, with agility and customer-centric innovation becoming crucial components of survival and growth in a rapidly evolving market.

Limitations & Improvements

At the end of my analysis, I did robustness checks for the periods 2010-2017 and 2018-2024 (Tables 6 & 7). I found that none of the variables had VIF values above 5, and the average VIF values were 2.09 and 2.90, respectively, below the threshold of 10 which is commonly considered a possible multicollinearity problem. This shows that there are no serious multicollinearity problems between the variables in the model over two different periods. Therefore, it helped me prove the stability and reliability of my regression model. Also, it provided a solid statistical basis for further analysis and conclusions.

Although the research on the effect of the COVID-19 pandemic on consumer spending through utilizing some models include key economic indicators and the robustness check fulfills the requirement, there remain several potential limitations and considerations that are critical to continuing to deepen understanding in both impact and further changes in consumer behavior related to the pandemic.

Firstly, the range of data and time series from which this study draws its base may fail to comprehensively capture the impact of the epidemic on long-term outcomes. In particular, the changes in consumption behavior in the later stages of the epidemic and the recovery phase of the economy could have been behaving differently than the data during this period of study. Considering the above, further research needs to take into consideration of long time series of the data to observe and analyze the change of the consumption trend from the outbreak of the epidemic to the full recovery of the economy, hence providing more accurate guidance in policy formulation.

In addition, while the study attempts to capture seasonal changes in consumer spending quarterly, spending trends for several types of goods can exhibit different fluctuations in spending within a season, such as during the holiday season or school season. Further refinement and development of further specified seasonal influencing factors should help to understand and predict seasonal changes in consumer behavior toward specific types of consumer goods more accurately.

Thirdly, this complexity in consumer behavior points toward the fact that apart from the macroeconomic indicators, various other factors may influence consumption decisions. They go from individual psychological factors to social influence and economic expectations. In future research, a deep interview or case study would be more useful, as these are qualitative tools that give the right kind of information on the decision-making process or changes in preferences at an individual consumer level. Such an approach will afford a much richer and, at the same time, more nuanced view for understanding the consumers' behavior during the epidemic that complements the existing quantitative analyses and supports developing more effective economic recovery strategies and marketing strategies.

Finally, this study is also limited in that it discusses more about the United States without talking about other countries and regions of the world. Given the global nature of COVID-19 and the varying economic structure, cultural background, government policy, and public health response amongst countries and regions, it would, therefore, quite possibly lead to various change patterns in consumer behaviors during outbreak impacts. As a result, US data alone may not capture the full

impact of the pandemic on global consumption trends. The cross-country comparative analysis has been added with more countries and regions, in such a way that the differences and similarities between the consumption behavior of the economies could be brought out better.

Such analysis would provide an extended perspective of the global economic impact of the pandemic but also support governments in the recovery process while balancing the interrelations of such intricacies of the international economic environment. Experiences cross-country would help researchers and policymakers be better placed in the identification of effective economic stimulus and consumption support measures and then advise more effective policies in repairing future global crises.

Furthermore, the implications of the model value toward the government to formulate policies relating to economic recovery are propounded hereinafter, as well as some practical guidance for consumers on what should be done against possible economic fluctuation and crises in the future.

Governments therefore need to shape accurate economic incentives, especially for those goods and services whose demand increases in times of epidemic. On the one hand, the government can support related industries through tax incentives and subsidization; on the other hand, by adjusting interest rates and taking incentives for savings, the government can encourage both consumption and consumers' financial safety. What is more, the influence of the season on consumer behavior means that at some time, the government should promote consumption recovery through such efforts as holiday promotions and the distribution of consumer coupons. Most importantly, the government needs to make the policy adaptive and flexible based on real-time data from both the economy and the epidemic to be able to catch up with the rapidly changing economic environment.

The message in this study for the consumers is that financial planning and saving in an era of uncertainty become effective ways to hedge against future threats of any form. Customers will be better able to adjust to the changing circumstances in economic and social surroundings if they understand how an epidemic affects demand for various types of goods in the first place and be prepared for consumption choices more in balance. The pandemic has changed consumption patterns more, with the growing share of online shopping and the tremendous demand for home entertainment devices all suggesting the need for consumers to tailor new ways of consumption to be able to adjust to the next set of challenges better.

To sum up, the study's findings provide guidelines for the government in forming effective economic policies and present practical advice to consumers on coping with the fluctuation of the economy and further crises. This will ensure that the society has adapted and, on such learning, to ensure that they are better adapted in both the societal and general way of ensuring economic stability and growth for the next pandemic situations.

Conclusion

In conclusion, this study systematically examines the differential impact of the COVID-19 pandemic on U.S. consumer spending for food, durable goods, and nondurable goods categories. Using large data sets that combine various economic indicators, the study found that epidemic-driven inflation and government policy responses reared their heads in more subtle ways, redefining consumer behavior and economic frameworks. In addition, the study found evidence of significant changes in consumption patterns. It is worth noting that inflation has had different effects on different categories of spending. For example, increased spending on non-durable goods such as hygiene products could be due to increased health awareness. Spending on durable goods, on the other hand, fell, reflecting increased economic uncertainty as consumers refocused on what was much needed.

Furthermore, this shift highlights the absolute need for economic adaptation and economic policies that can respond quickly to dramatic changes in consumer behavior. Moreover, the study found that government intervention did play a key role, with fiscal stimulus measures, such as increased unemployment benefits, playing a key role in cushioning the economy from the full impact of the pandemic (Federal Reserve Bank of San Francisco & Shapiro, 2020). These measures have maintained consumers' purchasing power despite massive job losses and economic turmoil, thus allowing continued spending on necessities. The study provides consumers with a practical guide on how to deal with economic instability. It suggests that in difficult economic times, people can consider focusing on necessary spending and building savings to help protect consumers from major financial disruptions. With the further development of digital consumption and e-commerce, consumers have reason to become increasingly familiar with online shopping platforms and digital payments, which have become increasingly important during the pandemic.

Looking forward to the future, this paper puts forward several ways for further research. Long-term studies are needed to see if the permanent behavioral effects of the pandemic will begin to show. Moreover, if this analysis is extended to global

comparative studies, it could add to our more general understanding of consumer behavior and the effectiveness of policies. In this regard, this study can deepen the analysis by investigating the impact of some specific sectors and by examining the decisive psychological and social factors in consumer decision-making during the crisis. Overall, it not only quantifies the immediate economic impact of the pandemic but also lays the foundation for a broader understanding of longer-term economic trends that will influence future market conditions and resulting policy decisions. It adds to the discussion on how to strengthen economic recovery and resilience, providing useful insights for policymakers and consumers to better prepare for and mitigate such global crises in the future. In other words, the purpose of the comprehensive analysis is to point out the need for flexible and adaptable economic strategies to support a sustainable recovery and long-term consumer well-being.

Tables

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
month	96	6.5	3.47	1	12
food	96	894.459	73.199	777.3	1039.2
dug	96	1226.744	124.061	1005.2	1485
ndug	96	2561.115	157.514	2241.3	2893
inf	96	2.011	.308	1.31	2.59
unemp	96	6.83	1.855	4.1	9.9
ppi	96	195.752	8.199	181	208.3
interest	96	-1.188	1.272	-3.906	3.278
saving	96	766.297	122.534	559	1408

Table 1 Summary of Variables 2010-2017

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
month	73	6.425	3.512	1	12
food	73	1244.267	153.614	1036.1	1467.5
dug	73	1833.834	306.654	1178.7	2219.1
ndug	73	3405.067	435.786	2730.2	4066.3
inf	73	2.081	.396	.99	2.88
unemp	73	4.697	2.192	3.4	14.8
ppi	73	224.321	28.647	185.5	280.251
interest	73	-.391	2.712	-7.103	6.005
saving	73	1411.493	1040.686	502.4	5976.4

Table 2: Summary of Variables 2018-2024

	(1) food	(2) dug	(3) ndug
inf	19.61**	33.629**	44.527**
	(8.097)	(14.911)	(17.96)
ppi	-.478**	-1.069**	3.871***
	(.222)	(.41)	(.494)
unemp	-40.53***	-68.263***	-88.464***
	(.954)	(1.757)	(2.116)
interest	-.584	-.964	-4.387*
	(1.108)	(2.041)	(2.458)
saving	.013	.019	.018
	(.01)	(.018)	(.022)
quar1			
quar2	1.998	4.405	-4.187
	(3.508)	(6.461)	(7.782)
quar3	5.277	10.514	3.019
	(3.942)	(7.259)	(8.743)
quar4	2.876	11.161	9.225
	(3.757)	(6.919)	(8.334)
_cons	1212.047***	1812.195***	2296.803***
	(35.748)	(65.836)	(79.296)
Observations	96	96	96
R-squared	.977	.972	.975

Standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

Table 3: Data from 2010-2017 without dum

	(1) food	(2) dug	(3) ndug
inf	-82.735***	175.517**	-40.259
	(30.819)	(78.901)	(72.738)
ppi	6.574***	9.225***	16.297***
	(.358)	(.916)	(.844)
unemp	12.27**	13.658	3.481
	(5.45)	(13.953)	(12.863)
interest	4.95*	6.699	16.946***
	(2.614)	(6.691)	(6.169)
saving	.026**	.059**	.052**
	(.011)	(.028)	(.026)
quar1			
quar2	-37.196**	-48.908	-59.563
	(16.906)	(43.281)	(39.9)
quar3	-12.97	16.512	11.608
	(16.747)	(42.875)	(39.526)
quar4	8.606	46.861	48.864
	(16.264)	(41.638)	(38.386)
_cons	-140.986**	-749.832***	-250.785*
	(58.43)	(149.589)	(137.905)
Observations	73	73	73
R-squared	.914	.859	.94

Standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

Table 4: Data from 2018-2024 without dum

	(1)	(2)	(3)
	food	dug	ndug
inf	-57.583***	65.448*	-22.637
	(14.982)	(34.358)	(32.017)
ppi	2.996***	3.117***	9.35***
	(.334)	(.766)	(.714)
unemp	-32.236***	-69.537***	-81.367***
	(1.651)	(3.786)	(3.528)
interest	8.231***	8.989**	21.114***
	(1.589)	(3.643)	(3.395)
saving	.04***	.058***	.069***
	(.006)	(.013)	(.012)
dum	232.597***	460.854***	476.022***
	(14.273)	(32.732)	(30.502)
quar1	-18.918**	-51.569***	-59.529***
	(7.946)	(18.222)	(16.981)
quar2	-4.921	-10.796	-26.964
	(7.825)	(17.945)	(16.722)
quar3	-5.226	.294	-11.635
	(7.784)	(17.85)	(16.634)
quar4			
_cons	634.832***	947.1***	1339.217***
	(55.821)	(128.011)	(119.291)
Observations	169	169	169
R-squared	.973	.956	.98

Standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

Table 5: Data from 2010-2024 with dum

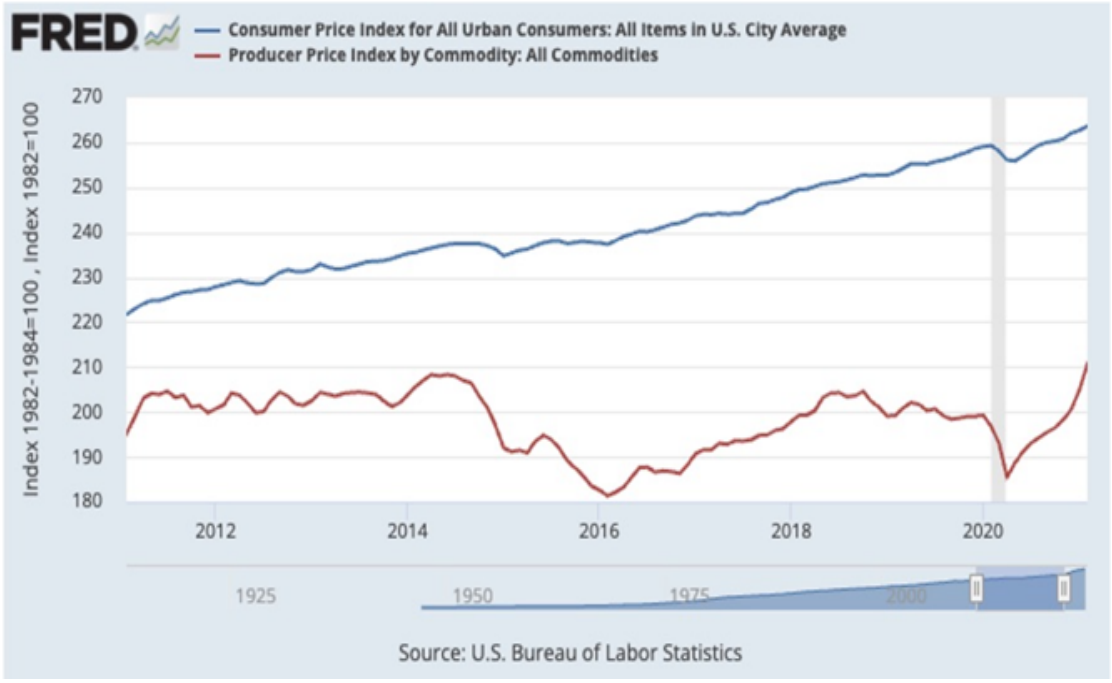
VIF	1/VIF
4.310	0.232
2.300	0.435
2.160	0.462
2.040	0.491
1.850	0.541
1.610	0.620
1.370	0.729
1.040	0.960
2.090	

Table 6: 2010-2017 Robustness Check

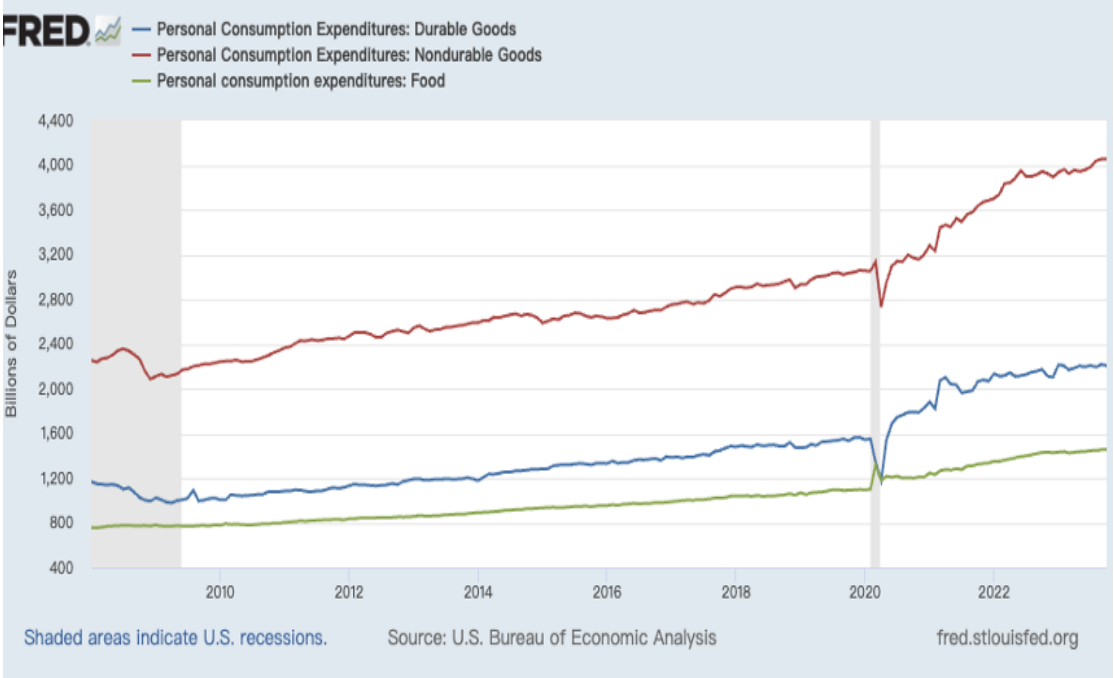
VIF	1/VIF
4.690	0.213
4.500	0.222
4.180	0.239
3.310	0.302
1.700	0.589
1.670	0.600
1.580	0.631
1.570	0.637
2.900	

Table 7: 2018-2024 Robustness Check

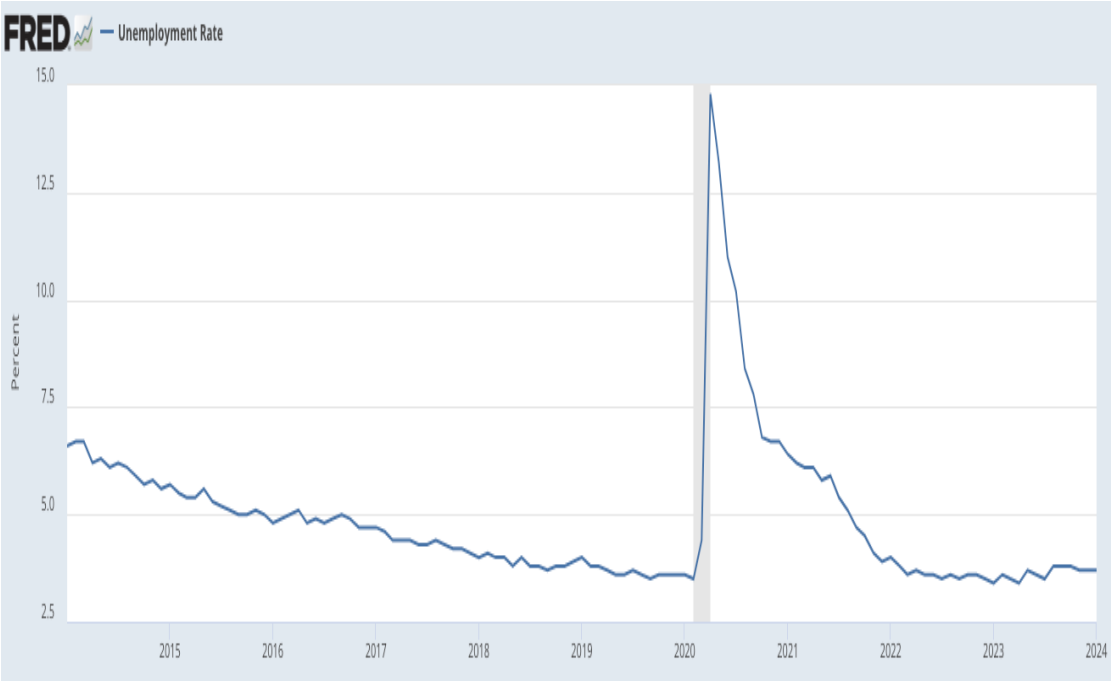
Graphs



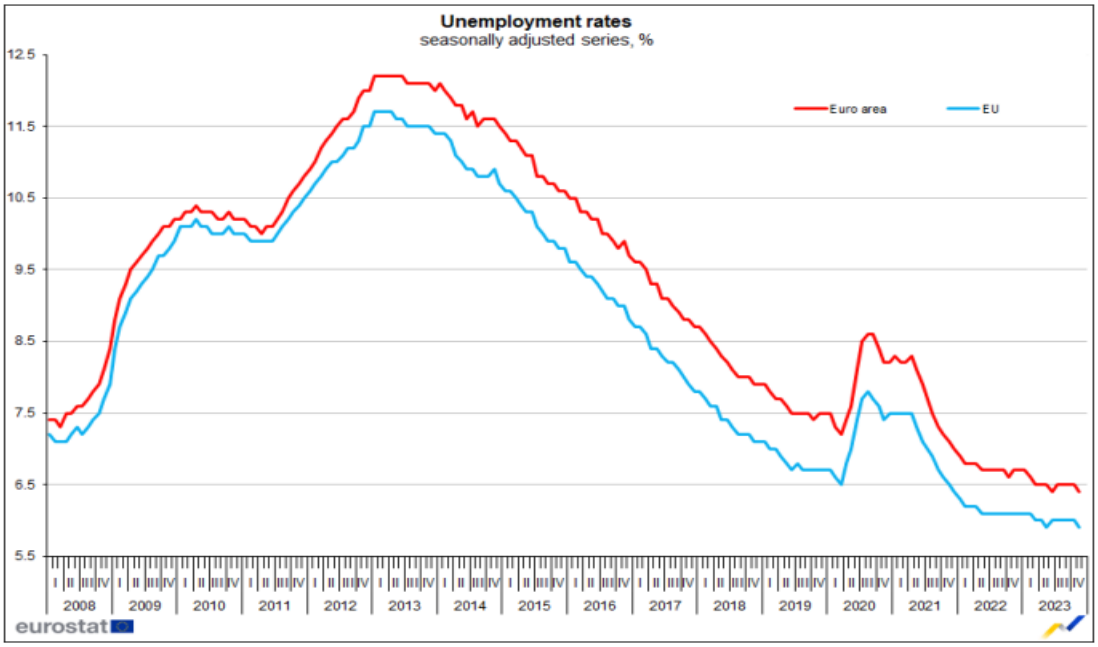
Graph 1: CPI&PPI (Source: FRED)



Graph 2: Personal Consumption Expenditures (Source: FRED)



Graph 3: U.S Unemployment Rate Change (Source: FRED)



Graph 4: Europe Unemployment Rate (Source: Government Website)

Work Cited

Akbulaev, N., Mammadov, I., & Aliyev, V. (2020). Economic Impact of COVID-19. Sylwan, 164, 113–126. https://doi.org/10.2139/ssrn.3649813

CHANGES IN CONSUMER BEHAVIOR IN THE CONDITIONS OF INFLATION. (n.d.). Retrieved November 19, 2023, from https://www.esd-conference.com/upload/book_of_proceedings/Book_of_Proceedings_esdPlitviceLakes2023_Online.pdf#page=81

Comin, D. A., Johnson, R. C., & Jones, C. J. (2023). Supply Chain Constraints and Inflation (Working Paper 31179). National Bureau of Economic Research. https://doi.org/10.3386/w31179

Dreger, C., & Gros, D. (2021). Lockdowns and the US Unemployment Crisis. Economics of Disasters and Climate Change, 5(3), 449–463. https://doi.org/10.1007/s41885-021-00092-5

Federal Reserve Bank of San Francisco, & Shapiro, A. H. (2020). A Simple Framework to Monitor Inflation. Federal Reserve Bank of San Francisco, Working Paper Series, 1.000-34.000. https://doi.org/10.24148/wp2020-29

Government of Canada, S. C. (2022, November 16). Behind the Numbers: What's Causing Growth in Food Prices. https://www150.statcan.gc.ca/n1/pub/62f0014m/62f0014m2022014-eng.htm

Herron, T. L., & Manuel, T. (2022). Ethics of U.S. government policy responses to the COVID-19 pandemic: A utilitarianism perspective. Business and Society

Review, 127(Suppl 1), 343–367. https://doi.org/10.1111/basr.12259

Karaosman, H., Marshall, D., & Villena, V. H. (2023). Chrysalis of crisis: Covid-19 as a catalyst for awakening power and justice in a luxury fashion supply chain. International Journal of Operations & Production Management, 43(10), 1634–1666. https://doi.org/10.1108/IJOPM-05-2022-0320

Mendez-Carbajo, D. (n.d.). Consumer Spending and the COVID-19 Pandemic. Retrieved April 29, 2024, from https://research.stlouisfed.org/publications/page1-econ/2021/01/04/consumer-spending-and-the-covid-19-pandemic

NBER. (n.d.). Unpacking the Causes of Pandemic-Era Inflation in the US. NBER. Retrieved April 29, 2024, from https://www.nber.org/digest/20239/unpacking-causes-pandemic-era-inflation-us

Omotayo, A., & Ngwenyama, O. (2022). Food security and disruptions of the global food supply chains during COVID-19: Building smarter food supply chains for post COVID-19 era. British Food Journal, 125. https://doi.org/10.1108/BFJ-03-2021-0333

Policy Studies, C. for E., Gros, D., & Ounnas, A. (2021). Labour Market Responses to the COVID-19 Crisis in the United States and Europe (SSRN Scholarly Paper 3832568). https://doi.org/10.2139/ssrn.3832568

Rose, N., Rowe, F., & Dolega, L. (2023). How consumer behaviours changed in response to COVID-19 lockdown stringency measures: A case study of

Walmart. Applied Geography, 154, 102948.

https://doi.org/10.1016/j.apgeog.2023.102948

USDA ERS - Food Spending Shifted in Response to Pandemic; Changes for Food Away From Home Continued Through 2022. (n.d.). Retrieved April 29, 2024, from https://www.ers.usda.gov/amber-waves/2024/january/food-spending-shifted-in-response-to-pandemic-changes-for-food-away-from-home-continued-through-2022/

Zhou, H., Yu, M., Li, J., & Qin, Q. (2021). Rare disasters, exchange rates, and macroeconomic policy: Evidence from COVID-19. Economics Letters, 209, 110099. https://doi.org/10.1016/j.econlet.2021.110099