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Covid-19 Inflation in the U.S.: Assessing the Impact of Monetary Policy, Public Debt, and Supply Chain Stress

Michael F. Williams, Prairie View A&M University Peter W. Sutanto, Prairie View A&M University

Abstract

This study examines the primary drivers of U.S. inflation during the COVID-19 pandemic, focusing on the impacts of monetary expansion, increases in the public debt, and supply chain disruptions. The massive government economic intervention in response to the pandemic led to a surge in both fiscal spending and the monetary base, raising concerns about their roles in the large increase in inflation between 2021 and 2024. To quantify the influence of each factor, we applied cumulative effects analysis, using the Personal Consumption Expenditures Price Index as the primary measure of inflation. Our findings suggest that monetary base expansion contributed to inflation with a lagged yet persistent effect, as increased liquidity gradually permeated the financial system, driving demand-side pressures. Meanwhile, the rapid accumulation of public debt had a more immediate influence on inflation, supporting theories that link significant fiscal expansion to demand-driven price rises. Supply chain disruptions, particularly severe in the early stages of the pandemic, were measured using the Global Supply Chain Pressure Index. These pressures contributed to inflation spikes by limiting the availability of key inputs and increasing production costs, though their impact was largely transient as supply chains began to normalize over time.

The results demonstrate the combined effects of fiscal, monetary, and supply-side factors on inflation, particularly during a large economic upheaval characterized by supply-side disruptions and large, protracted macroeconomic stabilization policies. By examining the timing and intensity of each factor's contribution, this research provides insights into the conditions under which inflationary pressures may arise in response to similar disruptions in the future. Policymakers may benefit from these findings when designing coordinated fiscal and monetary interventions aimed at balancing economic stabilization with inflation control. Our findings suggest that while supply chain constraints drive short-term inflationary spikes, longer-term inflationary trends are more likely fueled by sustained public debt and monetary expansion.

Introduction

The recent surge in inflation during the COVID-19 pandemic has sparked considerable debate among economists and policymakers over its primary causes. As governments around the world implemented public health measures to control the spread of the virus, the U.S. government responded with unprecedented fiscal and monetary interventions. Trillions of dollars were injected into the economy through



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stimulus checks, enhanced unemployment benefits, and business relief programs, leading to a significant increase in government spending. At the same time, the Federal Reserve System expanded the money supply at an record-setting pace to stabilize financial markets, support economic activity, and perhaps to accommodate, or monetize, the rapid expansion of the public debt. Critics of these measures argue that the sharp rise in inflation that followed was largely a consequence of the rapid increases in government spending and the money supply. Proponents of the government's response, however, maintain that these measures were necessary to prevent a deeper economic collapse and that inflation was driven primarily by supply-side constraints rather than excess demand caused by monetary growth (Brooks & Pingle, 2023; Blanchard, 2021).

This controversy underscores the need for a clearer understanding of the relationship between monetary policy, government spending, supply chain disruptions, and inflation, especially in times of crisis. To contribute to this understanding, this study examines the relative impact of three primary factors on inflation during the COVID-19 pandemic: monetary base expansion, public debt growth, and global supply chain disruptions.

Using monthly data from January 2020 to August 2024, this study explores how each of these factors influenced inflation, measured by the Personal Consumption Expenditures Price Index. We apply cumulative effects analyses to assess the extent and timing of each factor's impact, capturing both immediate and delayed inflationary effects. By comparing these influences, we seek to clarify the complex dynamics driving inflation in an era marked by economic volatility and extreme macroeconomic policy interventions. Our findings have implications for informing policy decisions during future economic disruptions.

Literature Review

Money Supply Expansion and Inflation

The relationship between money supply and inflation has been central to monetarist macroeconomic theory for decades. At the heart of this relationship is the classical Quantity Theory of Money, which asserts that inflation is a direct result of changes in the money supply. This theory, advanced by Irving Fisher early in the 20th century, posits that if the velocity of money and the output of goods and services remain constant, an increase in the money supply leads to a proportional increase in prices (Fisher, 1911). Later economists, led by Milton Friedman, further developed this concept by arguing that inflation is "always and everywhere a monetary phenomenon" (quoting Friedman), asserting that rapid growth in the money supply, beyond the economy's ability to produce goods and services, inevitably leads to inflation (Friedman, 1963).

Economic theory has also focused on the timing and extent to which changes in the money supply affect inflation, with studies suggesting that there is often a lag between monetary expansion and inflationary pressures. For example, research by Christiano, Eichenbaum, and Evans (1998) showed that the impact of monetary policy



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shocks on inflation can take several months or even years to fully materialize due to the time it takes for changes in the money supply to influence economic activity, interest rates and prices.

The theoretical and empirical findings on the relationship between money supply and inflation suggest that increases in the monetary base can lead to inflationary pressures with a lag. Building on these insights, this study will examine the cumulative effects of monetary base expansion on inflation during the COVID-19 pandemic, exploring both the magnitude and timing of its impact on consumer prices.

Public Debt and Inflation

The relationship between public debt and inflation is a central issue in macroeconomics, especially during recessions when government spending and deficit spending often surge. High levels of public debt can influence inflation in several ways, primarily through fiscal dominance and monetization of debt. Sargent and Wallace (1981) introduced the concept of fiscal dominance, suggesting that when government debt reaches high levels, central banks may be pressured to adopt accommodative policies, such as maintaining low-interest rates or increasing money supply to service the debt, which can lead to inflation. This dynamic often challenges the central bank's independence, as policymakers must balance inflation control with the need to avoid destabilizing government financing and debt markets (Reinhart & Rogoff, 2010).

Recent empirical studies support the idea that debt-financed government spending can lead to inflationary pressures. Reinhart and Rogoff (2010), in their study of historical public debt cycles, find that when public debt exceeds 90% of GDP, it correlates with higher inflation rates in both developed and developing economies. This relationship is amplified in situations where central banks monetize public debt, effectively converting fiscal deficits into a money supply increase. Empirical work by Kose, Nagle, Ohnsorge, and Sugawara (2021) also demonstrates that, particularly in emerging markets, debt monetization has a strong inflationary effect as central banks struggle to manage both price stability and fiscal obligations under debt pressure.

The COVID-19 pandemic has reignited this discussion, as fiscal responses involved substantial borrowing. The U.S. federal response, for instance, saw government debt surge to record peacetime levels, sparking debates about potential inflationary consequences. Blanchard (2021) suggests that while the immediate post-pandemic inflation of 2020-21 was fueled by supply chain issues and demand spikes, long-term inflation risks remain due to sustained high debt levels. Central banks in this environment may face constraints on their policy choices, potentially leading to an inflationary trend if fiscal pressures mandate continuous monetary accommodation (Bianchi & Melosi, 2017).

The above research suggests that significant increases in public debt can create immediate inflationary pressures, particularly when accompanied by accommodative monetary policies that support fiscal expansion. This study investigates how the rapid growth in U.S. public debt during the COVID-19 pandemic contributed to inflation.



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Supply Chain Disruptions and Inflation

The COVID-19 pandemic caused widespread global supply chain disruptions, which may have significantly impacted inflation rates, especially in the manufacturing and durable goods sectors. This disruption was largely due to shutdowns in production and supply chain bottlenecks caused by government policies meant to stem the spread of the virus. Many manufactured products rely on complex global supply chains, meaning that any bottlenecks—whether from shipping constraints, labor shortages, or factory shutdowns—translated into price increases for finished goods. Santacreu and LaBelle (2022) analyzed how these disruptions contributed to U.S. Producer Price Index (PPI) inflation. They found that supply chain issues, particularly those involving foreign suppliers, intensified PPI inflation across several industries, including motor vehicles and basic metals, which saw inflationary spikes when foreign bottlenecks were most severe.

Although the most severe supply disruptions were short lived, it took many months for the global economic system to return to a semblance of normalcy, which may have extended inflationary pressures over a prolonged period. Brooks, Orszag, and Murdock (2024) noted that the inflation spike attributed to supply chain bottlenecks lasted much longer than initially anticipated, as shipping delays and backlogs pushed costs higher across various industries. They argue that supply-driven inflation persists with a lag, perhaps taking longer to normalize than demand-driven inflation, especially when disruptions affect large manufacturing sectors such as technology and automotive manufacturing.

Additionally, Bai, Fernández-Villaverde, Li, and Zanetti (2024) examined how global shipping congestion and port delays affected the supply chain's ability to deliver parts to producers. Their research shows that even slight disruptions in critical industries such as semiconductor production can create ripple effects, leading to significant price hikes. Consequently, they argue that inflationary pressures shifted from initial demand shocks to persistent supply constraints by 2021-2022, as ongoing shortages and increased transportation costs added to production expenses, pushing consumer prices up across sectors.

The above research suggests that supply chain disruptions, especially when widespread and prolonged, can drive up prices in affected sectors and contribute to broader inflation. In light of these findings, this study will assess the extent to which global supply chain pressures impacted U.S. inflation early in the pandemic and whether this effect persisted over time.

The Debate over the Causes and Persistence of the 2021-24 Spike in Inflation

During the COVID-19 pandemic, all of the theoretical potential causes of inflation were in play—rapid increases in the money supply, rapid increases in government debt, and supply restrictions caused by worldwide government shutdowns of large portions of the world economy. This provides researchers an opportunity to examine to what extent monetary expansion, public debt expansion, and supply chain disruptions each contributed to the inflation of 2021-24.



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For example, Borio et al (2023) found that the rapid expansion of the money supply in 2020 played the primary role in the inflationary surge of 2021-22 across various countries, even when controlling for factors such as economic rebounds and fiscal stimulus. Conversely, Brooks and Pringle (2023) highlight the importance of both monetary and fiscal policy responses during the pandemic, showing that inflationary pressures were driven by the demand-pull forces of both expansionary fiscal and monetary policies.

In addition, some scholars emphasize that supply chain issues and labor market disruptions during the pandemic also significantly contributed to inflation. Blanchard (2021) contends that while monetary expansion undoubtedly added to inflationary pressures, the primary drivers of inflation were supply-side constraints and bottlenecks that reduced the availability of key goods and services. Similarly, Bai et al (2024) found that initial inflationary pressures during the pandemic were driven by supply chain shocks, but by 2022, constraints on productive capacity, such as labor shortages, became the primary driver of inflation.

Some researchers at the Federal Reserve System seem to split the difference between those who think government policy was the primary cause of inflation and those who blame supply side issues. Cai et al (2022) explore the sources of inflation during the pandemic using the New York Fed's dynamic stochastic general equilibrium (DSGE) model. They find that supply chain disruptions and rising energy prices were the primary drivers of inflation in 2021, while accommodative monetary policy and fiscal stimulus also contributed.

Was COVID-19 Inflation Transitory? The Summers-Krugman Debate

Beyond academia, one of the most prominent debates during the COVID-19 pandemic concerned the nature of the inflation that emerged in the U.S. and other advanced economies. This debate, largely centered around the question of whether inflation was "transitory" or a longer-lasting problem, was particularly embodied in the popular press by the contrasting views of renowned economists Lawrence Summers and Paul Krugman.

Summers was one of the earliest public voices to sound the alarm about the risk of sustained inflation due to the significant fiscal and monetary responses to the pandemic. In early 2021, Summers warned that the \$1.9 trillion fiscal stimulus package introduced by the U.S. government, combined with already accommodative monetary policy, could "set off inflationary pressures of a kind we have not seen in a generation" (Summers, 2021). Summers' argument was based on the scale of the stimulus, which he believed would create excess demand in an economy still constrained by supply-side disruptions. He suggested that the rapid expansion of the money supply and the aggressive fiscal spending were likely to overheat the economy, leading to persistent inflation that would not easily subside without significant central bank intervention.

Paul Krugman took an opposing stance, arguing that the inflationary pressures were likely to be transitory, driven primarily by temporary supply chain bottlenecks and the relatively brief shutdown of large portions of the economy. According to Krugman



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(2021), much of the price increases during the pandemic were attributable to short-term disruptions in the global supply chain, particularly in sectors like semiconductors, housing, and automobiles. He argued that these disruptions would ease as COVID-era restrictions were relaxed, allowing inflation to subside as supply-side issues were resolved. Krugman maintained that there was little evidence of the kind of wage-price spirals that typically lead to sustained inflation. He also emphasized that the inflationary effects of fiscal and monetary stimulus were likely to be short-lived, particularly as the economy adjusted to new demand levels.

The Summers-Krugman debate represents the larger divide in economic thinking about the drivers of inflation during the pandemic. Summers' warnings became more prescient as inflation persisted into 2022. By contrast, Krugman acknowledged that inflation had lasted longer than he anticipated but remained convinced that it was primarily due to supply-side factors that would eventually normalize.

Data and Methodology

These debates over the causes of pandemic-era inflation are the primary impetus for our study, which examines the relationship between the inflation rate and three other variables—the increase in the monetary base, the increase in the public debt, and the change in the global supply chain pressure index.

Data

This study utilizes monthly data spanning from January 2020 to August 2024. The dataset includes the following variables:

U.S. Monetary Base: This measure, sourced from the Federal Reserve Economic Data (FRED) database, encompasses currency in circulation and reserves held by banks at the Federal Reserve. It reflects the Federal Reserve's influence on the money supply and provides a foundation for understanding monetary policy effects on inflation.

U.S. Federal Debt: Total Public Debt: Retrieved from a U.S. Department of the Treasury dataset, this variable includes the total outstanding federal debt, capturing both privately held and intragovernmental holdings. It measures the government debt accumulation resulting from fiscal responses to the COVID-19 pandemic.

U.S. Global Supply Chain Pressure Index (GSPCI): This index, developed and maintained by the Federal Reserve Bank of New York, quantifies pressures on global supply chains. It is constructed from a range of transportation cost measures and manufacturing indicators, providing insight into supply chain disruptions that may influence price levels.

U.S. Personal Consumption Expenditures Price Index (PCEPI): Obtained from FRED, the PCEPI is a broad measure of U.S. consumer prices for goods and services. It is widely used by policymakers as an inflation gauge and will serve as the sole measure of inflationary impact in our analysis.



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Each of these variables will be analyzed to assess the relationships of monetary base expansion, public debt increases, and supply chain pressures on inflation, as reflected by changes in the PCEPI.

Methodology: Cumulative Effects Analysis

Cumulative effects analysis is a method used to examine the impact of changes in key variables over time by capturing both immediate and lagged responses within a rolling period. This approach is useful in macroeconomic research, where the effects of policy actions, market shifts, and external shocks often unfold gradually rather than quickly.

For our purposes, cumulative effects analysis is well-suited for assessing the inflationary impact of monetary expansion, public debt accumulation, and supply chain disruptions during the COVID-19 pandemic. Each of these factors is theorized to impact inflation through different channels and with varying time lags. For instance, monetary base expansion is expected to influence inflation with a longer lag, as increased liquidity takes time to circulate through the economy. Conversely, public debt-driven fiscal expansion may exert more immediate demand-side pressures on prices. Supply chain disruptions, with their direct impact on production costs and availability of goods, can lead to sudden but potentially short-lived inflationary effects.

By applying cumulative effects analysis with specific rolling periods tailored to each variable—12 months for monetary expansion, 6 months for public debt, and 3 months for supply chain pressures—this study captures these differing temporal dynamics.

The choice of a 12-month lag period for monetary expansion reflects an approximate midpoint of estimates reported in empirical studies examining its lagged effect on inflation. McCandless and Weber (1995), using data on 110 countries over a 30-year period, observed that inflationary responses to changes in the monetary base typically occur within a range of approximately 9 to 18 months, aligning with the patterns observed in our analysis.

A 6-month lag is chosen for public debt because fiscal interventions, such as government stimulus spending, have a more immediate impact on aggregate demand and consumer prices compared to monetary policy. Reinhart and Rogoff (2010) highlight that direct government spending, financed by borrowing, quickly boosts economic activity and exerts upward pressure on prices as funds are rapidly disbursed to households and businesses.

The 3-month lag for supply chain pressures reflects the immediate effects of disruptions on production costs and the availability of goods. Santacreu and LaBelle (2022) note that supply chain stress directly impacts prices within weeks or months, as observed during the early pandemic period, distinguishing these effects from the broader mechanisms of monetary and fiscal factors.

Overall, this gradated cumulative effects analysis is an appropriate tool for this research because it aligns with the complexity of inflationary processes, where multiple



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factors with varied timelines converge. This method allows for an integrated assessment of how these variables collectively shaped inflation during a period of tremendous economic intervention and disruption, offering insights valuable to policymakers and others seeking to understand inflation dynamics in similar crisis contexts.

Results

Cumulative Effects Analysis of the Monetary Base and PCEPI

In analyzing the cumulative relationship between changes in the U.S. monetary base and the PCEPI, we investigate the impact of monetary expansion on inflation over a rolling 12-month period. Given that inflationary pressures are theorized to follow changes in the monetary base with a delay, a cumulative percentage change model was applied to both variables from January 2020 to August 2024.



Figure A: Cumulative 12-Month Percent Change in Monetary Base vs. PCEPI

Figure A displays the cumulative 12-month percentage changes for both the monetary base and the PCEPI, providing a visual representation of the lagged relationship between these variables. The data reveal an initial sharp increase in the monetary base during early 2020, with cumulative growth reaching over 50% by early 2021. This substantial expansion corresponds with the Federal Reserve's unprecedented monetary interventions to mitigate the economic impact of the COVID-19 pandemic. During this period, however, the PCEPI shows only modest cumulative growth, indicating a lagged response in consumer prices to the surge in the monetary base. The delayed impact supports economic theories suggesting that liquidity from



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monetary base increases permeates the economy gradually, eventually driving up demand and exerting upward pressure on prices.

As expected by monetarists, the cumulative change in the PCEPI begins to rise significantly after several months, notably in mid-2021, when cumulative inflationary growth accelerates. This pattern suggests that the inflationary effects of monetary expansion are not immediate but unfold over time, as increased liquidity translates into higher consumer spending and demand. Even as the cumulative growth in the monetary base starts to stabilize by mid-2021, cumulative PCEPI growth remains elevated and continues to rise into 2022, indicating a prolonged inflationary response.

Periods of divergence between the monetary base and PCEPI cumulative changes are also observed. For instance, while the monetary base stabilizes, cumulative PCEPI growth continues, suggesting that other factors, such as supply chain disruptions, fiscal stimulus, and shifts in demand, may contribute to sustaining inflationary pressures. These observations highlight the complexity of inflation dynamics, where monetary policy is a key but not sole driver of price changes.

This cumulative analysis implies that large-scale monetary expansion during economic crises can result in prolonged inflationary pressures, even as monetary growth normalizes. Consequently, policymakers must carefully consider both the timing and scale of interventions, as well as complementary factors such as supply shocks and government deficit spending, to manage the inflationary consequences of monetary expansion effectively.

Cumulative Effects Analysis of Public Debt and PCEPI

This section examines the cumulative relationship between U.S. public debt and the PCEPI to assess the impact of fiscal expansion on inflation over a rolling six-month period. Given the theory that public debt influences inflation with a shorter lag compared to the monetary base, a cumulative percentage change model was applied to both variables from January 2020 to July 2024.

Figure B displays the cumulative six-month percentage changes for both public debt and the PCEPI. The data reveal that during the early stages of the COVID-19 pandemic, rapid accumulation in public debt corresponds closely with increases in the PCEPI with a several-month lag, particularly around early 2021. This period aligns with significant fiscal interventions aimed at supporting economic recovery, including stimulus packages and other relief measures. These actions likely exerted immediate upward pressure on consumer demand, translating more quickly into inflationary effects than the increase in the monetary base examined earlier.

In contrast to the observed lag with monetary base effects, the shorter delay between public debt increases and PCEPI growth aligns with fiscal dominance theories. These theories suggest that fiscal policy, when characterized by large increases in public debt, can influence inflation directly through increased government spending, which impacts demand sooner than liquidity-driven effects of monetary expansion. By mid-2021, as public debt accumulation begins to stabilize, the cumulative PCEPI growth



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remains elevated, indicating that inflationary effects persist even after fiscal expansion moderates.





Periods of divergence between cumulative changes in public debt and the PCEPI suggest that other contributing factors, such as ongoing expansionary monetary policy and supply chain constraints, may have also played a role in sustaining inflation. These observations underscore the nuanced role of fiscal policy in driving inflation during the 2020-24 period, where significant public debt accumulation can generate immediate and sustained inflationary pressures, yet it is clear that public debt expansion is not the only cause of inflation.

This cumulative analysis implies that fiscal expansions during economic crises can exert swift effects on inflation. For policymakers, these findings, combined with the evidence that monetary policy also contributes to inflation, emphasize the importance of timing and scale in fiscal interventions, and coordination with the monetary authority, to balance economic stabilization with inflation control.

Cumulative Effects Analysis of the GSPCI and PCEPI

This section examines the cumulative relationship between the Global Supply Chain Pressure Index (GSPCI) and the PCEPI. The GSPCI quantifies global supply chain stress, integrating data on transportation costs, manufacturing delivery times, and other logistics indicators across multiple countries. To evaluate the impact of supply





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chain pressures on inflation, a cumulative percentage change model was applied over a rolling three-month period from January 2020 to July 2024.

Figure C displays the cumulative three-month percentage changes for both the GSPCI and the PCEPI. During the early months of the COVID-19 pandemic, the GSPCI shows a large cumulative increase (in fact, it is the largest 3-month increase in the history of the GSPCI), reflecting the intense disruptions in supply chains caused by global lockdowns and production delays. This initial spike aligns with the period when consumer goods prices began to rise, suggesting that supply chain pressures had an early and immediate impact on inflation.



Figure C: Cumulative 3-Month Percent Change in GSPCI vs. PCEPI

However, as the GSPCI stabilizes and even decreases somewhat by mid-2021, the cumulative PCEPI growth remains elevated and continues to rise. This divergence implies that while supply chain disruptions may have initially contributed to inflationary pressures, their influence on consumer prices became less significant over time. Instead, the other factors we have examined—the expansion of the monetary base and the increase in the public debt—may have increasingly driven inflation after the early pandemic period.



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Discussion of Results

The cumulative effects analyses for the monetary base, public debt, and supply chain pressures reveal distinct relationships between each factor and inflation. These analyses provide insights into the relative contributions of monetary expansion, fiscal debt accumulation, and supply chain disruptions to inflationary pressures in the context of the COVID-19 pandemic.

The analysis of *monetary base expansion* demonstrates a delayed yet prolonged impact on inflation. During the initial months of the pandemic, the monetary base experienced significant cumulative growth as the Federal Reserve enacted expansive monetary policies to stabilize the economy. This increase in liquidity permeated the economy gradually, with cumulative inflationary effects emerging after a lag of several months. Even as growth in the monetary base began to stabilize, inflationary pressures continued, suggesting that liquidity-induced inflation may sustain over time once it begins. This observation aligns with established monetary theory, which highlights the lagged but persistent effects of liquidity on price levels.

In contrast, the analysis of *public debt increase* indicates a shorter lag between fiscal expansion and inflationary pressures, suggesting a more immediate effect on consumer prices. Public debt rose sharply as the government implemented large-scale fiscal interventions to support households and businesses. This rapid fiscal response led to an immediate increase in demand, contributing to inflationary pressures more quickly than monetary expansion alone. The inflationary effect of public debt persisted even as the rate of debt accumulation stabilized, implying that fiscal expansion can result in sustained price increases by directly boosting demand. These findings are consistent with fiscal dominance theories, which posit that substantial public debt can lead to inflation through increased government spending that stimulates demand directly.

The analysis of *supply chain disruptions* suggests that supply chain pressures contributed to inflationary spikes early in the pandemic but had a more temporary impact relative to monetary and fiscal factors. The GSPCI showed an immediate and strong positive relationship with inflation during the early pandemic months, a period marked by severe global logistics constraints. This initial alignment between the GSPCI and PCEPI indicates that supply chain disruptions contributed to short-term inflationary pressures. However, as global supply chains began to recover and GSPCI values decreased, the connection with cumulative PCEPI growth weakened, implying that other factors, including sustained monetary and fiscal interventions, played a more substantial role in maintaining inflation levels. This pattern suggests that while supply chain issues can lead to short-term inflationary spikes, their influence on long-term inflation is more limited.

In summary, these analyses indicate that *monetary base expansion and public debt increases* played a more significant role in sustaining inflation throughout the pandemic period, while *supply chain disruptions* had an immediate but largely transitory effect. These findings underscore the importance of both monetary and fiscal policy in



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driving inflation dynamics, particularly during crises when both policy tools are heavily utilized. For policymakers, these insights highlight the roles that liquidity expansion, fiscal debt, and supply chain conditions play in shaping inflationary trends, emphasizing the need for a balanced, coordinated approach when employing these tools to manage economic stability and inflation control.

Monetization of the Public Debt

Indeed, it may be a chimera to consider monetary policy independent from fiscal policy. During the pandemic, the Federal Reserve significantly increased its holdings of U.S. Treasury securities, which contributed to a substantial expansion of the money supply—in effect, monetizing a major portion of the massive increase in the public debt. Although there was no direct coordination between fiscal and monetary policymakers, there may exist an overwhelming implicit desire by the monetary policy to ensure that large increase in government deficit spending are not disruptive to financial markets that are already shaken by private sector economic shocks.

Therefore, although a primary cause of inflation was the rapid increase in the money supply, it could be argued that the large federal budget deficits and government stimulus spending were indirectly responsible for inflation as they created a need for the Fed to expand its balance sheet to absorb the new debt. This form of fiscal dominance, where the central bank's actions are influenced by the government's fiscal policy, can lead to inflationary outcomes, especially when large fiscal interventions coincide with supply-side disruptions, as seen during the pandemic (Andolfatto, 2020).

Indeed, research suggests that the combination of aggressive fiscal stimulus and the accompanying accommodative monetary policy may have led to the inflation spike observed in 2021-2022, as the Fed monetized a large portion of the massive budget deficits (Allen, 2021). The significant increase in government debt and its financing through monetary expansion may have combined to create a surge in aggregate demand that fueled price increases, making this an important consideration when analyzing the causes of inflation during this period.

Limitations of the Research

While this research provides insights into the relationships between monetary expansion, public debt, supply chain pressures, and inflation, several limitations should be acknowledged to ensure a reasonable interpretation of the results.

One limitation arises from the methodological constraints associated with using cumulative percentage changes. While the cumulative approach allows for the observation of lagged effects, it may oversimplify complex, nonlinear relationships among the variables. Inflation dynamics are influenced by an intricate interplay of factors, including monetary and fiscal policy, supply chain conditions, and labor market dynamics. These interdependencies are challenging to fully capture in a cumulative effects analyses, and therefore our results may not entirely account for the multifaceted nature of inflationary processes.



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Additionally, potential endogeneity concerns exist within the relationships explored. For instance, public debt and monetary base expansions are often implemented as policy responses to economic downturns, which themselves can influence inflation. Although this research treats these factors as independent drivers of inflation, the endogenous nature of policy decisions complicates the isolation of their effects on inflation. Future research might consider using econometric models that control for endogeneity or employ exogenous shocks to more precisely capture the causal effects of these variables on inflation.

Finally, this study focuses on a limited set of explanatory variables. While monetary base expansion, public debt, and supply chain pressures are significant factors, inflation is inherently multifactorial and may also be influenced by other determinants, such as labor market conditions, global commodity prices, geopolitical events, and evolving consumer expectations. A broader model incorporating these additional factors could enhance the robustness of the findings, although data limitations and the complexity of inflation forecasting pose major challenges for such an approach.

Conclusion

This study investigated the inflationary impact of three key factors during the COVID-19 pandemic: monetary base expansion, public debt accumulation, and supply chain disruptions. Using cumulative effects analyses, we assessed the influence of each factor on inflation, to capture both immediate and delayed responses. The findings suggest that while each factor contributed to inflation, their impacts differed in timing and persistence.

Monetary base expansion exhibited a delayed but sustained effect on inflation, consistent with traditional monetary theory, which posits a lag between increases in the money supply and consumer price rises. Public debt accumulation, on the other hand, had a more immediate impact on inflation, likely due to the direct demand-stimulating effects of large-scale government spending. Meanwhile, supply chain disruptions contributed to short-term inflationary pressures at the onset of the pandemic but had a more transient effect as global supply chains gradually stabilized.

These results highlight the multifaceted nature of inflationary pressures in times of crisis, where monetary, fiscal, and supply-side dynamics interact to shape price levels. For policymakers, the findings underscore the need to balance fiscal and monetary interventions carefully to manage inflation effectively. The study also suggests that while supply chain pressures can drive inflation in the short term, long-term inflationary trends are more likely influenced by sustained fiscal deficits and monetary expansion.

Future research could build on these findings by exploring other factors contributing to inflation, such as labor market dynamics, energy price volatility, and international trade shifts. Understanding these complexities is essential for designing effective economic policies that can maintain price stability during periods of economic upheaval characterized by major supply shocks.



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