THE KEYNESIAN STIMULUS MODEL: STIMULATING ECONOMIC ACTIVITIES WITH STIMULUS PAYMENTS

by

Christopher Osuoha

Liberty University

A Dissertation Presented in Partial Fulfilment

Of the Requirement for the Degree

Doctor of Philosophy

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ABSTRACT

Governments use cash transfers as a fiscal measure to stimulate economic activities during shocks. As COVID-19 continues to ravage economies globally, governments worldwide have responded with fiscal and monetary policies to manage its economic impact. In addition, the U.S government has intervened with direct transfers to provide liquidity to prevent a prolonged shock. However, opinions are divided on the efficacy of the Keynesian stimulus policy to generate enough of a multiplier to stimulate economic activities compared to the monetarist approach. This study analyzes the classical Keynesian model and compares it with the monetarist model to provide insight for policymakers into the stimulus policy outcomes of the Coronavirus Aid Relief and Economic Security (CARES) Act of 2020 and subsequent policies used to manage the COVID-19 shock. This study used a mixed-method research design to collect and analyze relevant data. Monthly time-series data from the Bureau of Economic Analysis (BEA), Bureau of Labor Statistics (BLS), and the Federal Reserve Bank (the Fed) from July 2019 to May 2022 of the percentage changes in GDP, disposable personal income (DPI), and personal consumption expenditure (PCE), as well as unemployment rates (UR), interest rates (INT), and inflation rates (IFL) were collected and analyzed. The study uses multiple regression (MR) to empirically examine the variables' relationships to ascertain the model's short-term efficacy. The evidence in the Keynesian model suggests that DPI, PCE, and UR significantly predicted the percentage change in GDP, whereas, in the monetarist model, UR, INT, and IFL did not substantially predict the change in GDP. The study finds that the Keynesian theory is more practical in managing shocks, but combining both models could yield a more desirable long-term outcome.

Keywords: COVID-19 shock, cash transfers, the Keynesian and monetarist models, fiscal vs. monetary policy, changes in GDP

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Dedication

First, this dissertation is dedicated to my Lord and Savior, Jesus Christ, for His mercies, blessings, and grace. I especially want to dedicate this dissertation to the memory of my father, Eze Livinus Osuoha. He inspired me to seek more profound knowledge rather than superficial knowledge, and my mother, Mrs. Eunice Chioma Osuoha, for instilling a solid work ethic in me.

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I am grateful to God for assembling a team of highly cerebral and supportive professors who played a critical role in helping me accomplish this goal. I would like to immensely express my gratitude to the Committee Chair, Dr. Steven Manley, for his invaluable support, timely feedback, and advice throughout this journey. To Dr. Jennifer Purvis, my committee's reader, I appreciate your insightful guidance, support, and firm stance on excellence. Furthermore, I am grateful to Dr. Ronald Rodgers for accepting to be a part of the committee, sharing his experience, and making invaluable contributions. I want to thank my family, my wife, Patria, my children, and all my siblings for their unconditional support and love throughout this rigorous journey.

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CHAPTER ONE: INTRODUCTION

Overview

When the Coronavirus disease (COVID-19) first emerged in Wuhan, Hubei Province of China, the global concern was focused on its public health impact and the threat to human life. Governments worldwide implemented many measures to contain the spread of the virus. Apart from the daily increase in deaths and hospitalizations, these restrictive measures and recommended health protocols culminated in an economic shock. The U.S. government responded with a fiscal stimulus package to prevent the economy from sliding into another Great Depression after the painful recession experienced a decade earlier. This study analyzes the Keynesian model to ascertain how fiscal transfers stimulate economic activities. The study seeks to illuminate how such transfers could boost economic activities to address the economic impacts of COVID-19. The pandemic caused unemployment, panic, and a decline in consumer confidence. Keynes (1957), Baker et al. (2020), and Baqaee and Farhi (2021) noted that increased liquidity sustains personal consumption expenditure (PCE) and disposable personal income (DPI) because of the multipliers it produces.

However, monetarists believe that expansionary monetary policy could produce the desired outcome of stimulating economic activities in the long run. Milton Friedman (1968) argued that monetary policy could offset severe economic disturbances from other sources in the long run. Mankiw and Reis (2018) disagreed with Friedman's classical long-run theme and its centrality on expectation. In their words, "The long run is a misleading guide to current affairs" (Mankiw & Reis, 2018, p. 87). Keynes argued that "in the long run, we are all dead" (Keynes, 1937). This study analyzes the fiscal stimulus applied during the ongoing pandemic compared with an alternative policy to illuminate the efficacy of Keynesianism.

Background

The origin of COVID-19 is traceable to Wuhan, Hubei Province in China. Park et al. (2020) and Ren et al. (2020) explained that COVID-19, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), first appeared in Wuhan in December 2019. The early COVID-19 cases were diagnosed in December 2019; by February 2020, the virus had spread to an alarming proportion of the world and quickly became a global pandemic. In March 2020, COVID-19 began ravaging New York, spreading rapidly to other big cities in the United States, including Chicago, Seattle, and Miami, and becoming an unprecedented public health crisis. Baker et al. (2020) and Benzeval et al. (2020) documented many measures that federal and state governments used to contain the spread of the virus, including travel restrictions, shelter-in-place orders, and the closure of non-essential businesses. These measures caused many economic hardships, such as massive job losses, declines in consumer confidence, and a significant strain on national output. Ren et al. (2020) noted that fear and misinformation about the virus caused panic and disrupted the free flow of people, goods, and services. They emphasized the psychological effect of the fear of a deadly infectious disease on society and insisted that people feel unsafe, uneasy, and anxious (Ren et al., 2020). Ordinarily, when such fear and uncertainty grip society, people are compelled to be cautious of others in order to protect themselves. However, such precautionary health safety measures have severe economic consequences and distort the market dynamics for non-essential products and services. Literature, including that of Baker et al. (2020), Chetty et al. (2020), and Baqaee and Farhi (2021), supported the notion that the adverse effects of fear or stigma constrain consumer confidence and severely depress demand.

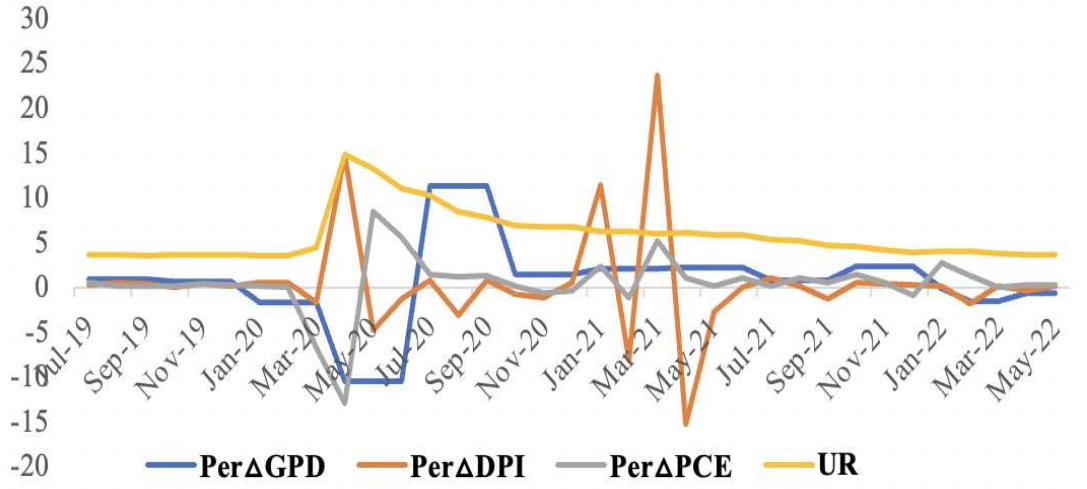
The U.S. government responded with fiscal stimulus, a Keynesian approach that President Franklin D. Roosevelt (FDR) used to implement the New Deal to revive consumer confidence and

stabilize the economy during the protracted Great Depression of the 1930s. Gravelle, Hungerford, and Labonte (2009) explained that fiscal policy temporarily stimulates the economy but increases the budget deficit, raising government spending through direct or consumption spending by the recipients of tax cuts or cash transfers. The justification of the stimulus proponents is that direct cash transfers are a quick method to sustain household consumption and stimulate aggregate demand (AD). Dender, O'Reilly, and Perret (2020) argued that policies that provided liquidity support to vulnerable small businesses and families relieved them of the economic hardship caused by the containment measures. However, the stimulus transfers aimed to alleviate the pandemic's severe effects on social outcomes and stimulate AD through the multiplier effect of government transfers. Baker et al. (2020) discussed the rationale for the stimulus extensively. They offered valid evidence that "the effect of these payments relies on the household's marginal propensity to consume (MPC), out of the stimulus transfers" (Baker et al., 2020, p. 2). Their findings showed that MPCs are essential to public policy and economic theory because the MPCs from transfers produce multipliers in many policy models (Baker et al., 2020). Therefore, if the economy is expected to be hit by a severe shock, proactive policies become indispensable to insulate the economy from that shock. The significant rise of PCE after each round of the transfers supports Keynes's view on government intervention.

The trend shown in Figure 1 on page 17 reemphasizes the Keynesian theory, suggesting that the main barrier to economic activities is contracting income due to the COVID-19 threat, leading to inadequate personal income and declining personal consumer spending; hence, the $600 payment of the second fiscal stimulus in January 2021 caused a rise in both DPI and PCE. Casado et al.(2020), Chetty et al. (2020), and Fornaro and Wolf (2020) found a link between the Keynesian

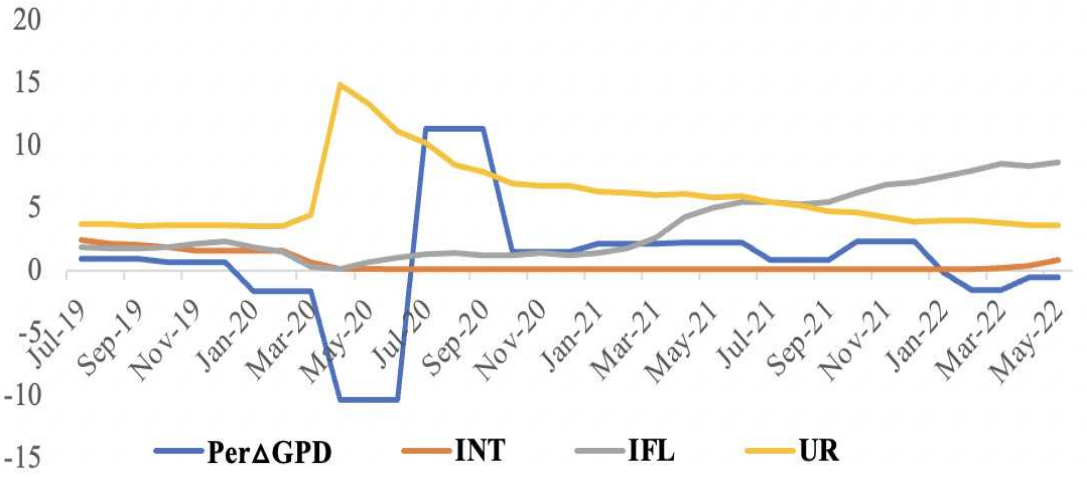
theory and their empirical results. Moreover, they constructed various indices from different data sources to establish relations with the theoretical foundations.

Figure 1: Percent change in GDP, DPI, PCE, and UR from preceding month, Jul 2019 - May 2022



Source: BEA, BLS, & FRED

Figure 2: Percent change in GDP, INT, IFL, and UR from preceding month, Jul 2019 - May 2022



Source: BEA, BLS, & FRED

As shown in Figure 2 on page 17, the lowering of the interest rate in February 2020 caused a significant decline in the inflation rate; thus, inflation neared 0% in April 2020 and then maintained an upward trajectory. The inflation rate reached a 40-year high of 7.9% in February 2022 and has continued to rise since. While interest rates remained at their lowest from April 2020 until March 2022, the Federal Reserve Bank (Fed) raised interest rates from 0.20% in March 2022 to 1.21% in June 2022. The changes in GDP fluctuated significantly between March and October 2020. The GDP growth was unstable from June to October 2021 despite the Fed maintaining stable interest rates. The unemployment rate consistently declined from April 2020 to January 2022. Figure 2 suggests that starting from January 2022, the Taylor rule could not hold, thus reinforcing Guerrieri et al.'s (2020) view on monetary policy; therefore, the interest rates were adjusted in tandem with the rise in the inflation rate without considering the decline in GDP.

Carvalho and Rezai (2016) argued that changes in income distribution affect AD, which supports Keynes's theory that increased liquidity leads to higher output and a greater multiplier from consumer spending. Keynesians, including Chetty et al. (2020) and Baqaee and Farhi (2021), admit that the COVID-19 shock requires a stimulus to maintain household consumption and provide a higher MPC to restore macroeconomic equilibrium. However, critics of the Keynesian stimulus solution to shocks expounded the Hayekian free-market idea to reemphasize Freidman’s claim that the money supply has an enormous effect on the national output. Krugman and Wells (2017) and Mankiw and Reis (2018) argued that fiscal stimulus was effective in confronting the Great Depression of the 1930s and the last Great Recession in 2008 despite the debate in the policy arena that trailed the outcomes of the New Deal policy and the American Recovery and Reinvestment Act (ARRA). The belief that fiscal stimulus was successful in those instances

emboldened the federal government to proactively pass the legislation to ameliorate the hardship and contain the economic effects of the pandemic.

On March 25, 2020, the CARES Act was passed as a comprehensive policy response to the economic hardship caused by the pandemic. The evidence from Baker et al. (2020) and Chetty et al. (2020) suggests that the $2 trillion stimulus program under the CARES Act, including the cash transfer of $1,200 per adult, an additional $500 per child under the age of 17 years, and the payroll protection assistance to small businesses, stimulated AD. The U.S. government provided two more rounds of the stimulus in 2021, with $600 and $1400 transfers, respectively. The argument that dominated the policy arena among mainstream economists is whether the size of the transfers was large enough to generate the expected multipliers and if the timings were consistent with the desired policy outcome. Although the pandemic continues, looking at the time horizon of the analysis of the policy measures is critical, as observed by Mankiw and Reis (2018). They argued that "Milton Friedman viewed the long run as the timeframe under which we should apply principles of classical economics, especially monetary neutrality" (p. 84). Their view was that regardless of the actions taken by the Fed, unemployment would, over time, reach its natural rate, which implies that the time horizon is a misleading guide to current affairs. Hence, this research focuses on the short run. The policy assessment of the past pandemics in the last century, including the 1918 Influenza, the 1957 H2N2 virus, the 1968 H3N2, and the 2009 H1N1 Swine Flu, shows that the time horizon shapes the dominant reactionary policies.

Problem Statement

As the Coronavirus continues to ravage economies worldwide, its impacts are profoundly felt. Economists have a near consensus that the pandemic is the most severe global health crisis since the 1918 Influenza that claimed 50 million lives worldwide. Keynes (1936) and free-market

economists, including Fredrich Hayek (1944) and Milton Freidman (1968), agreed that shocks have severe impacts on the economy, hence the use of economic policy to manage them and stimulate the economy. To address the 2008 Great Recession, the Fed complemented the U.S. government's fiscal measures with expansionary monetary policy. The combination of both approaches constrained the ability to ascertain each policy's efficacy empirically. Consequently, this constraint created a gap in the existing literature due to the lack of proper instrumentations to compare the effects of the distinct policy measures using the two models. Therefore, this research proposes using the Keynesian and monetarist models to investigate the outcome of the policy interventions applied to manage the impact of COVID-19.

This study measures the effects of the explanatory variables, including the percentage changes in the DPI, PCE, and the unemployment rate (UR), as proxies of the dependent variable, the percentage change in GDP in the Keynesian model. In contrast, the monetarist model uses the federal funds rate, inflation rate, and UR as independent variables to predict the changes in the GDP. Both models used the UR as a variable because the Keynesian and monetarist models aim to stimulate the economy, close the recessionary gap, and restore full employment to reduce the UR. Therefore, the UR measures the outcome of fiscal as well as monetary policies. Baker et al. (2020), Chetty et al. (2020), and Baqaee and Farhi (2021) found that consumption (C) and investment (I) are additive components of spending. However, Fiebiger and Lavoie (2018) and Pollitt et al. (2021) found that the Taylor rule provides intertemporal coordination to stabilize AD in the long run. This study compares the two models' outcomes to ascertain whether the Keynesian stimulus offers a better policy solution to the COVID-19 shock or whether monetary expansion is a more practical alternative.

Purpose Statement

The purpose of this research is to examine the direct stimulus payments by the U.S. government using the Keynesian model and the variations in the interest rates by the Fed using the monetarist model to determine their efficacy in stimulating economic activities during the COVID-19 pandemic. This study identifies relevant variables and employs similar procedures as those employed by Casado et al. (2020), Chetty et al. (2020), Fornaro and Wolf (2020), and Baqaee and Farhi (2021) to gather time series data from the beginning of the pandemic from primary sources. Monthly time-series data were collected from the Bureau of Economic Analysis (BEA), Bureau of Labor Statistics (BLS), and the Fed from July 2019 to the most recently available data of the percentage changes in GDP, DPI, and PCE, as well as the UR, federal funds interest rate, and inflation rate. The percentage changes in the DPI, PCE, and UR are the explanatory variables in the Keynesian Model. In the alternative monetarist model, the independent variables are the federal funds rate, inflation rate, and UR. In both models, the explanatory variables predict the percentage change in GDP as the dependent variable. The study uses 120 data points from the data collected to provide insight into the problem and answer the research questions.

Significance of the Study

The study is significant in that it addresses the concerns about the efficacy of the Keynesian stimulus policy in the aftermath of the Covid-19 pandemic. Apart from contributing to the growing body of literature on stimulus transfers during shocks such as the Covid-19 pandemic, this study is of practical and theoretical significance by filling the gaps in the literature and providing new evidence in the Keynesian and monetarist models using actual data. From a theoretical perspective, it provides evidence that the Keynesian model's new variants are consistent with the classical Keynesian theory. Keynes (1936) noted that "the transition from lower to a larger scale of activity

involves an increased demand for liquid resources" (p. 668). Studies have shown that intervention increases demand, which induces firms to increase their investment, thus sustaining the consumers' expectation for future income with the resultant effect of unleashing the animal spirit that drives consumption (Baker et al., 2020; Baqaee & Farhi, 2021; Bernanke et al., 2005; Casado et al., 2020; Fornaro & Wolf, 2020). However, these studies did not compare the evidence under the fiscal and monetary models to provide clear evidence of the comparative outcomes. This study tests the theory with new data.

The evidence from Fornaro and Wolf (2020) suggests that monetary intervention to sustain demand produces a multiplier that reverses the supply-demand loop. Altig et al. (2020) contested this view by finding that a high level of uncertainty does not bode well with monetary policy for rapid recovery because firms and consumers are cautious; it retards investments, hiring, and consumer spending on durable goods. This study seeks to provide valuable analytical and empirical evidence to help policymakers and analysts evaluate the effectiveness of economic stimulus and decide on the appropriate stimulus size to deliver the desired outcome. Fornaro and Wolf (2020) argued that to restore full employment, "the Fed needs to inject further monetary stimulus" (p. 4). The size and number of rounds of the stimulus have been the subject of policy debate. The proponents of the stimulus argued that more rounds of stimulus yield a desirable result, whereas the critics insisted that more stimuli will increase the national debt. The existing literature did not indicate whether the policy measures should target households' and firms' incomes. This study seeks to prove whether fiscal measures divert spending from consumer goods to savings.

Research Questions

To fill the gaps in the literature, this study aims to gain insight into the efficacy of the stimulus model. The study investigates the outcomes of the measures implemented by the U.S.

government to manage the impact of the Covid-19 pandemic to ascertain whether the Keynesian stimulus or the monetarist approach delivers a more desirable outcome in the short run. The desirable outcome is the increase in economic activities measured as the percentage change in the real GDP. The Keynesian theory postulates that fiscal stimulus provides liquidity to support consumers' spending on goods and services (Keynes, 1936). Keynes argued that declining consumption and investment spending depress the economy and lead to a recessionary gap, underemployment of labor, and disequilibrium in potential output. The research question of this study is whether the fiscal measures under the CARES Act and the subsequent stimulus yielded the desired result of stimulating economic activities than monetary expansion. Therefore, to address this question, it is pertinent to investigate the policy response to the COVID-19 pandemic beyond the findings of Baker et al. (2020), Chetty et al. (2020), Casodo et al. (2020), Fornaro and Wolf (2020), and Baqaee and Farhi (2021) to choose the best. Thus, the following sub-questions provide the conceptual and empirical imperative to evaluate using the Keynesian model to address the Covid-19 shock.

RQ1: How much, if at all, does the change in DPI from direct government transfer payments raise the GDP?

RQ2: To what extent does the increase in PCE correlate with the changes in economic activities?

RQ3: To what extent does the unemployment rate correlate with GDP change?

RQ4: To what extent does the absence of government intervention lead to increased economic activity?

Monetarists, including Milton Freidman (1968) and Fiebiger and Lavoie (2018), argued that reducing interest rates to increase the money supply makes borrowing attractive and stimulates

consumption and investment spending. Freidman's monetary expansion idea is to "restate theoretically, apply empirically and enunciate the policy implications of the quantity theory of money" (White, 2012, p. 320). Freidman (1968) and Feibiger and Lavoie (2018) explained that the essence of monetary expansion is to induce a long-term AD by varying lending rates, injecting reserves, and altering the reserve requirements to boost the stock of money growth rate. In addition, "the Fed needs to be open to a rational discussion of alternative monetary rules in attempting to improve the monetary regime" (Dorn, 2019, p. 592). These views make it imperative to empirically examine the monetarist theory to provide further insight by analyzing these research questions that pertain solely to the monetarist model.

RQ1: To what extent does the interest rate (INT) reduction induce growth in the GDP?

RQ2: To what extent does the UR resulting from money injection and altering the reserve requirements correlate with a change in GDP?

RQ3: To what extent does the inflation rate correlate with GDP change?

RQ4: To what extent does the absence of monetary policy intervention or free-market approach in the short run lead to increased economic activities?

Definitions

1. *Cash Transfers* – Cash payments to vulnerable households or individuals to reduce economic hardship, alleviate poverty, improve health conditions, and achieve other socioeconomic outcomes (Heise, Lutz, & Ranganathan, 2013).
2. *Coronavirus* – Coronavirus or COVID-19 is a highly contagious disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that was first diagnosed in Wuhan, China in December 2019 (Park et al., 2020; Ren et al., 2020).

3. *Fiscal Policy* – The use of government spending and tax to influence macroeconomic conditions (Keynes, 1936; Mankiw, 2020).
4. *Keynesian Model* – John Maynard Keynes's theory that fiscal spending effectively manages AD to stimulate a depressed economy by raising consumer confidence (1936).
5. *Monetary Policy* – The Fed's interest rates and money supply variations help steer the economy in the desired direction (Krugman & Wells, 2017).
6. *Monetarist model* – Milton Freidman's theory that reducing the interest rates and reserve requirements increases the money supply and liquidity (Freidman, 1969).
7. *Shock* – Economic contagion that severely disrupts the flow of goods and people and stalls economic activities, causing recession (Carlsson-Szlezak, Reeves, & Swartz, 2020).

CHAPTER TWO: LITERATURE REVIEW

Overview

Economic shocks are critical events that impact the economy. Shocks disrupt demand and supply in a complex and unpredictable manner, thus destabilizing the macroeconomy. Therefore, there are two types of shocks: demand and supply shocks. Severe weather, war, and labor strikes that disrupt the supply of goods and services are factors that cause a supply shock. Carlsson-Szlezak, Reeves, and Swartz (2020) noted that supply shocks damage the supply side of the economy and thus, disrupt credit mediation, stunt capital formation, and slow recovery, which forces workers to leave the workforce and leads to the loss of vital skills and a decline in economic activities. However, increasing prices, loss of income, and an extensive drop in consumer and investor confidence constrain the animal spirit and cause demand shock. The impacts of shocks on the economy could be drastic. They can affect micro-level demand and supply changes, culminating in significant changes in AD and aggregate supply (AS). The COVID-19 pandemic is a severe health crisis of global magnitude. Andolfatto (2021) argued that this pandemic fits the bill of a supply shock because as the pandemic surges, it severely affects society's ability to produce goods and services. Barret et al. (2020) observed that economists see COVID-19 as a supply shock but reasoned that a supply shock could create a demand shock. Additionally, considering the nature of the economic effects of the COVID-19 shock, it is appropriate to place it within the Keynesian context as a demand shock because the demand aspect appears more dominant than the supply aspect. Keynes (1936) identified the 1930s Great Depression as a demand-side problem caused by liquidity constraints that weakened consumer confidence and depressed AD. A supply shock is easier to correct by boosting suppliers' production ability.

The Coronavirus precipitated the economic contagion that continues to spread as the virus mutates into different variants. Baker et al.'s (2020) view was consistent with Chetty et al.'s view that the preventive health protocols to contain the spread of the virus severed market dynamics, stalled economic growth, and posed the potential threat of an epic recession on a global scale. Their views resonate with that of Carlsson-Szlezak, Reeves, and Swartz (2020), who argued that the pandemic's trajectory imposes a higher economic cost, making the prediction of its path nearly impossible as multiple dimensions of the pandemic are unprecedented and unknowable. Moreover, health authorities contend that the virus has been mutating into many variants and has now reached an endemic stage. Therefore, developing an appropriate policy response to mitigate the severity of its economic impacts is necessary. Recently, relevant works have examined the economic effects of the pandemic and policy interventions to reduce them. Notable among the literature are the studies by Baker et al. (2020), Chetty et al. (2020), and Baqaee and Farhi (2021), which used the Keynesian fiscal policy approach to analyze the pandemic's impact, and the studies by Dorn (2019), Fornaro and Wolf (2020), Casado et al. (2020), and Pollitt et al. (2020), which used the monetarist approach. Data constraints were a significant limitation in these studies that created gaps due to the ongoing nature of the pandemic and its antecedent economic impacts. For example, Dorn (2019) used the federal fund's rates to test the modern monetary theory (MMT) to investigate the efficacy of monetary theory. Fornaro and Wolf (2020) estimated the intertemporal effect of interest rate. In contrast, Baqaee and Farhi (2021) calibrated their model and data in a quantitative input-output model to test the impact of the stimulus on output, employment, and inflation.

New data will uncover fresh evidence and trends that may support or refute the findings in the earlier literature. However, the evidence available in the literature is valuable in developing the theoretical and empirical framework for this study. First, the information available in the

related literature helps contextualize the problem, identify the research gaps, and develop an appropriate research design to fill the gaps. For example, Chetty et al. (2020) suggested that stimulus transfers rely on the MPC and the multipliers they produce, reinforcing the Keynesian classical theory that liquidity unleashes the propensity to consume. In addition, this study conceptualizes the research inquiry under the Keynesian and monetarist models to address the policy problems identified in the research questions by reviewing the methods and exploring the gaps in the related literature. For example, Baker et al. (2020) identified PCE and DPI as variables to measure the relationship between the $1200 cash stimulus and MPC. Also, Fornaro and Wolf (2020) estimated the effect of nominal interest rate based on spending to stabilize output around its potential level and manage Friedman's temporary trade-off between inflation and employment. Second, the theoretical constructs of this study help address the research questions with the policymakers and researchers as the target audience to provide the rationale for addressing severe shocks such as COVID-19 with these policy approaches.

Benzeval et al. (2020) found that the pandemic's shock affected different individuals and households disproportionately. As Nakamura and Steinsson (2018) identified, the choice of policy approach depends on the exogenous variations, such as structural shocks and their causal effects. Chetty et al. (2020) isolated monetary expansion and focused on the Keynesian model. Fornaro & Wolf (2020) and Casado et al. (2020) argued that comparing both models helps to determine a better policy approach. However, data limitations constrained Baqaee and Farhi (2021) in their attempt to address this problem. Therefore, it is essential to compare the outcomes of the

Keynesian fiscal stimulus and monetary expansion to rigorously evaluate the application of the Keynesian model to the COVID-19 shock.

The Conceptual Framework

The Keynesian Model

John Maynard Keynes's fiscal multiplier is the conceptual foundation of economic stimulus policy. Keynes (1936) claimed to discover the practical flaws of the free-market approach to shocks during the Great Depression and posited that increased government spending to stimulate the economy is critical in reviving the depressed demand. The idea behind this is that fiscal spending effectively manages the AD to stimulate a depressed economy by raising consumer confidence. In Dender, O'Reilly, and Perret's (2020) view, while fiscal measures could stimulate demand, fiscal policy could incentivize behavior congruent with the desired public health goals. Therefore, fiscal policy should target the macroeconomy and not individual consumers' financial burdens, which can divert income to non-consumable spending. The classical Keynesian goal of the stimulus is to reinvigorate economic activities, restore consumer confidence, and close the output gap to bring employment to its full potential. The positive shift in consumer expectations drove the recovery from the 1930s Great Depression and the 2008 Great Recession. Even Eggertsson's (2005) evaluation of FDR's fiscal approach to the Great Depression in a dynamic stochastic general equilibrium (DSGE) model showed that expanded government actual and deficit spending caused a significant shift in consumers' expectations. He argued that "the key to the recovery was the successful management of expectations about future policy" (Eggertsson, 2005, p. 4). However, Sergent (1983) and Temin and Wigmore (1990) offered a counternarrative: FDR's removal of the policy dogma to combine fiscal and monetary policies increased demand during the Great Depression.

FDR heeded Keynes's advice in designing the New Deal policy, thus rejecting the classical economists' orthodoxy and opening a new frontier for economists to manage shock. Keynes (1936) refuted Friedrich Hayek's free-market theory and argued that the free market is incapable of self-correction. Keynes (1937) further argued that without intervention, it is difficult for the market to adjust itself in the long run during persistent contraction of AD; instead, the economy would reach a new equilibrium characterized by slow growth, a high unemployment rate, and a recessionary gap. Thus, the central idea of classical Keynesian theory is that direct stimulus transfers provide liquidity that increases consumption spending. Keynes's approach has been validated in recent literature. The evidence in Baker et al. (2020), Chetty et al. (2020), and Baqaee and Farhi (2021) validated the classical Keynesian theory because the cash transfers to households and small businesses increased consumption spending among low-income families, nearly restoring pre-COVID-19 consumer spending. However, the results from Fornaro and Wolf (2020), Casado et al. (2020), and Pollitt et al. (2020) provided incomplete evidence of cash transfers increasing DPI. Fornaro and Wolf's (2020) estimate of the intertemporal substitution effect of nominal interest following the new standard Keynesian model proposed by Gali (2009) showed a demand-driven slump and supply-demand doom loop that may last longer than the pandemic and can cause a pessimistic animal spirit, the unwillingness of consumers to spend. These findings support the view that the cash transfers stimulated consumer spending, alleviated the pandemic's hardship, and stimulated the economy.

The long debate among economists on the role of government tends to draw the line at the choice of interventionist policy to manage the economy. Adam Smith (1776) made a clear case for limited government involvement in his thesis, "The inquiry into the causes of the wealth of nations." He laid out the free-market principle that profit motive and competition align private

interest with the public interest. Smith (1776) brought to bear the idea that government should not control the private sector. However, more than a century later, Adolph Wagner (1883) found a positive correlation between fiscal spending by the government and economic growth. Hence, the increased public demand for government intervention for regulatory and protective purposes, particularly during shocks. Keynes (1937) argued that the free market fails to achieve the optimal allocation of resources; hence, the government's role is to disrupt the competitive market process to alter the distribution between individual consumers with intervention measures. Keynes's idea is that the government's increase in fiscal spending and the tax cuts will increase disposable income, drive consumption, and boost private sector investment. Hayek's view, which reflects the monetarist concern, is that fiscal stimulus has the long-term consequence of a higher inflation rate.

Keynesian theorists believe that stimulus spending increases disposable income and output, thus causing an increased demand for money. However, Mankiw (2011) showed that the effect of the stimulus on production and employment depends on the investment-savings (IS) and liquidity preference-money supply (LM) curves. He explained that the IS curve, which represents equilibrium in the goods market, and the LM curve, which represent equilibrium in the money market, jointly determine interest rates and national income in the short run (Mankiw, 2011). Thus, the consumption function assumes the following form:

$$C = \overline{C} + c\ (Y+\overline{TR} - tY)\ c>o \qquad \text{(Eq.1)}$$

where $\overline{C}$ is the autonomous consumption, c is the marginal propensity to consume, Y is income, $\overline{TR}$ is transfer payment (stimulus), t is the tax rate, and $c>o$ shows the direct relationship between consumption and disposable income. Assuming that the private investment function is:

$$I = \overline{I} - bi \quad b>0. \qquad \text{(Eq.2)}$$

where *b* measures the interest rate elasticity of investment, $\overline{I}$ is the autonomous investment, which is not dependent on the federal funds rate and consumers' income. However, Baker et al. (2020), Chetty et al. (2020), and Baqaee and Farhi (2021) noted that transfer payment could cause a substantial shift in the AD curve. Hence, Cheng (2015) derived the AD curve as follows:

$$AD = C + I + G + NX = [\overline{C} + c\overline{TR} + c\,(1-t)\,Y] + (\overline{I} - bi) + \overline{G} + \overline{NX}$$

$$= \overline{A} + c(1\text{-}t)\,Y\text{-}bi \qquad \text{(Eq.3)}$$

where $\overline{A} = \overline{C} + c\overline{TR} + \overline{I} + \overline{G} + \overline{NX}$ represents the level of autonomous spending needed to maintain equilibrium in the goods market. Therefore, Eq.3 can be modified to meet the requirement for the market to clear as:

$$Y = AD = \overline{A} + c\,(1\text{-}\,t)\,Y - bi \qquad \text{(Eq.4)}$$

However, from Keynes's (1937) idea of government-increased fiscal spending, the IS curve can be derived as the function of the multiplier fiscal spending produces. Thus,

$$AD = C + I + G + NX = [\overline{C} + c\overline{TR} + c\,(1-t)\,Y] + (\overline{I} - bi) + \overline{G} + \overline{NX}$$

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$$Y = AD = \overline{A} + c\,(1\text{-}\,t)\,Y - bi \qquad \text{(Eq.4)}$$

$$\mathrm{i} = \frac{\overline{A}}{b} - \frac{[1-c(1-t)]Y}{b} = \frac{\overline{A}}{b} - \frac{Y}{aGb} \qquad \text{(Eq.5)}$$

where $\frac{1}{aGb}$ is the slope of the IS curve and $\alpha_G = \frac{1}{1-c(1-t)}$ is the multiplier of fiscal spending. This implies that the IS curve is determined by the multiplier of fiscal spending α_g and the interest elasticity of private investment *b*.

Fadul's (2021) finding reemphasized the power of the government spending (*G*) multipliers discussed in Blanchard and Perotti (2002) as a post-estimation transformation that helps to appraise the ratio of response of economic activity to fiscal spending. Blanchard and Perotti (2002) estimated the spending multiplier as the ratio of the GDP response at the time horizon *k* to the initial variation of government expenditure at horizon *0*, dividing it by the average share of government spending in GDP to stimulate economic activities (Fadul, 2021). Thus, the multiplier is derived as follows:

$$impact\ (k) = \frac{\Delta y_0}{\Delta g_0} \frac{1}{g/y} \qquad \text{(Eq.6)}$$

where $k = 0$ denotes the impact multiplier. This implies that for any 1% increase in government spending, the GDP will rise by the percentage calculated in Eq.6. However, Montford and Uhlig (2009) proposed a cumulative multiplier of fiscal measures to estimate the changes in GDP and *g* using their discounted present values. They modified Blanchard and Perotti's (2002) multiplier as a summation of responses in output *y* and the summation of the current value of the changes in *g* for both time horizons *t* from *0* to *T* as follows:

$$\text{cumulative } (T) = \frac{\sum^{T}_{t=0} (1 + i)^{-t} \Delta y_t}{\sum^{T}_{t=0} (1 + i)^{-t} \Delta g_t} \frac{1}{g/y} \qquad \text{(Eq.7)}$$

The shortcomings of this measure, as noted by Gordon and Krenn (2010) and later by Ramey (2019), are two-dimensional. First, the variation in GDP is calculated as a marginal effect of *g* on *y* relative to the marginal impact of *g* on itself, which is contradictory in the absence of innovation generated by *g*. Second, the equation assumes that the fiscal spending to GDP ratio (*g/y*) is constant, which Ramsey (2019) argued makes the multipliers counter-cyclical compared to the actual pattern. This study estimates the impacts of the stimulus using the Keynesian approach

and compares it to the outcome from the monetarist model to avoid this problem in measuring the effect on GDP.

Considering GDP as a national accounting system, all the components of its equation rely on liquidity to expand. Thus:

$$GDP = C + I + G + NX \quad (Eq.8)$$

where C is consumption spending, I is investment spending, G is government spending, and NX is net export, $NX = (EX\text{-}IM)$. This implies that the GDP growth depends on the increase in these component variables. The Keynesian theorists believe that liquidity drives AD and AS; hence, fiscal intervention effectively stimulates the economy during shock. Regardless of the source of liquidity, an increase in liquidity raises households' and individuals' income and stimulates consumption spending. Gwartney et al. (2018) explained that "an increase in the supply of money will lead to a proportionate increase in the price level" (p. 285), which means that price (P) will drive output (Y), catalyzing higher private-sector productivity measured in the real GDP. The multiplier of consumption spending (M) will induce a higher velocity (V) of money that places the economy on a faster recovery path in the short run. Thus, operationalizing the quantity theory of money to demonstrate the effectiveness of the money transmission mechanism expressed as $PY = GDP = MV$ in Gwartney et al. (2018) shows the relationship between monetary policy and increased private sector spending. From the Keynesian perspective, fiscal intervention after the CARES Act of 2020 was expected to significantly increase households' income. Indeed, the effect produced a significant rise in DPI and PCE, as shown in Figure 1.

However, the critical policy question remains unanswered: To what extent does fiscal transfer stimulate demand compared to monetary expansion? Thus, this crucial question touches on the fundamental assumption that raising household consumption spending translates into

increased economic activities, as Keynes (1936) emphasized and Baker et al. (2020) reemphasized. The premise of these submissions provides the Keynesian stimulus model's conceptual framework and this research's theoretical foundation. The new Keynesians have modified the classical Keynesian construct of liquidity to show that the efficacy of transfer payments relies on the household's MPCs that influence the consumers' behavior (Baker et al., 2020; Baqaee & Farhi, 2021). The CARES Act of 2020 was passed based on the envisioned liquidity it would provide consumers and the multipliers arising from the spending. Parker et al. (2013) explained that the limitations of traditional monetary policy were the rationale for the Obama Administration's preference for fiscal policy to stabilize the economy during the 2008 Great Recession. Stilwell and Primrose (2010) held a similar view, namely, that social spending during a severe economic shock reestablishes investor and consumer confidence to boost AD in the short run. The theoretical quagmire was recently raised by Andolfatto (2021) in his study of the problem of monetary-fiscal policy coordination using three policy parameters: nominal interest rate, budget deficit, and money growth rate. Andolfatto (2021) noted that the money growth rate determines inflation in a steady state. Still, during shocks, the fiscal authority decides the money supply, making long-run inflation a fiscal phenomenon (Andolfatto, 2021). For a pragmatic solution in dire situations, such as the COVID-19 shock, policymakers often turn to relevant policy models. Keynes (1937) recognized the link liquidity provides between demand and consumption and posited that "the transition from a lower to a larger scale activity involves an increased demand of liquid resources" (p. 668). The main criticism against Keynesianism is its enormous budget deficit consequences.

The pandemic challenged researchers to channel considerable efforts to identify the policy impact of fiscal transfers on economic aggregates—specifically, the effect of government spending during a severe shock. Opinions are still divided on whether increased government spending

during the pandemic helped boost the U.S. economy and avert significant contraction. Keynesian theorists, including Baker et al. (2020), reemphasized Barro's (1981) position that temporary spending affects GDP more than a permanent purchase. In contrast, Dender, O'Reilly, and Perret (2020) contended, from a neoclassical perspective, that permanent purchases provide more remarkable results than temporary purchases. It implies that there is a considerable distinction between temporary and permanent changes in government spending. Hence, this study focuses on the short-run impact of the fiscal stimulus rather than the long-run effect. However, Baqaee and Farhi (2021) looked at fiscal spending multipliers differently. They grouped the fiscal multipliers into local and national types using cross-sectional panel data and econometric methods to estimate the impact (Baqaee & Farhi, 2021). The approach did not consider the possible implications of monetary policy. This study finds it critical to evaluate the direct effects of fiscal stimulus using multiple regression (MR) to seek a causal relationship between the aggregates of fiscal spending and changes in GDP and compare it to the outcome of monetary expansion.

The Monetarist Model

The conceptual foundation of the monetarist model is that reducing interest rates and reserve requirements increase the money supply and liquidity. Bordo and Rockoff (2013) argued that "lowering interest rates is more effective in managing the aggregate demand and supply to stimulate private-sector spending" (p. 8). The idea is that varying interest rates and money supply help steer the economy in the desired direction. Krugman and Wells (2017) noted that the broad definition of money comprises cash in circulation, current account balances, savings account balances, other near monies such as travelers' checks, and certificates of deposits used in regulating the economy. Like fiscal policy, "monetary policy can serve as contractionary and expansionary measures in the short run" (Krugman & Wells, 2017, p. 552). Expansionary monetary policy

manages shocks such as the Coronavirus by lowering interest rates to make borrowing attractive and expand the aggregate money supply through the open market operation (OMO). Cochran et al. (2015) explained that the central bank could buy or sell government bonds to regulate the economy by injecting or withdrawing money from circulation to contract or expand liquidity. Seidman and Lewis (2015) explained that monetary policy could stimulate the economy during a severe recession without significantly increasing the budget deficit, which implies that the monetarist model does not affect the budget deficit; thus, stimulus-without-debt is preferable. Hamilton and Herrera (2001) noted that OMO directly regulates liquidity because of the shorter time lag of added liquidity, estimated at seven months. In Hamilton and Herrera's (2001) view, "for a modest and unanticipated expansion in aggregate demand, the liquidity effect of monetary policy dominates" (p. 7). The time lag found in Bernanke, Gentler, and Watson (1997) raised concern about whether lowering interest rates and increasing the money supply can raise the GDP growth rate. If it can, to what extent does it stimulate economic activities?

The policy lag found in Bernanke, Gentler, and Watson (1997) brings to bear the concern about the effectiveness of monetary expansion in managing shocks such as the COVID-19 pandemic. Recall that during the 2008 Great Recession, Bernanke applied quantitative easing (QE) in the trenches to maintain a steady money supply growth. On the other hand, the monetarists argued that fiscal measures alone could not address the severe shocks sufficiently. This argument resonates with the policy question posed by Fornaro and Wolf (2020) about what constitutes the optimal economic policy. Moreover, such a policy concern resonates with the research questions and reinforces the study's purpose of finding an appropriate metric for gauging the optimality of the Keynesian and monetarist models in addressing the Coronavirus shock. In a severe crisis like the COVID-19 pandemic, determining optimal endogenous variables such as inflation rate,

unemployment, and GDP often presents a public policy challenge, making trade-offs between policy goals critical. For example, the CARES Act of 2020 and other relief policies prioritized liquidity over fiscal deficit because of limited government resources and competing spending demands. Schmitt-Grohe and Uribe (2005) considered this and proposed that interest rates and OMO are the best tools to regulate the economy. In their words, "the central goal of optimal monetary policy is price stability, and an optimal inflation rate of 0.5 percent with the volatility of 1.1 percent" (Schmitt-Grohe & Uribe, 2005, p. 393). Their position raised a new challenge of policy phases the government must undergo beyond the initial response to COVID-19 to relax measures, enact economic support recovery, and restore public finances after the pandemic (Dender, O'Reilly, & Perret, 2020). However, if these views are correct, how can monetary expansion maintain a stable price level and simultaneously stimulate AD without significant changes in the DPI and PCE during the pandemic?

There have been concerns about the utilization of government monetary expansion during shock and the potential antecedent inflation. Alpanda (2019) and McLeay and Tenreyo (2020) noted that the Phillips curve describes the trade-off between monetary policy utilization and inflation. Watson (2007) and Coibion and Gorodnickenko (2015) argued that the Phillips curve had maintained a flatter trend in the short run, implying that inflation has become significantly insensitive to standard measures of monetary policy utilization such as unemployment. In recent studies, including that of Kan (2021), the slope of the Phillips curve and the Fed's welfare loss function jointly determined optimal monetary policy. Therefore, it is vital to understand the slope of the Phillips curve and the factors that cause it to flatten. Policymakers must correctly interpret the dynamics of the Phillips curve and its application to address the COVID-19 shock to reach policy optimality. The rationale is that shocks, particularly cost-push shocks resulting from the

pandemic, should capture the trade-off between inflation and GDP growth in policymaking. Guerrieri et al. (2020) observed that the shock represents the labor market conditions in the ongoing pandemic. If monetary expansion causes the inflation rate to rise, then monetary policy is optimal in the short term. Thus, Guerrieri et al. (2020) modified the Phillips curve to:

$$\pi_{A,t} = \beta\varepsilon_t\{\pi_{A,t} + 1\} + k_\gamma y_t + \Omega_t + \mu_t \quad \text{(Eq.9)}$$

where μ_t is the cost-push shock from the pandemic, it becomes imperative to determine the optimal monetary policy. The optimal monetary policy optimizes the Fed's inflation rate, output gap, and federal lending rate at different stages of the shock. Thus, the shock moves the inflation rate and output gap in the opposite direction, representing the trade-off that faces the Fed. It implies that the optimal inflation rate, output gap, and federal funds rate are a function of the shock μ_t. The shock modifies the Taylor rule as:

$$i_t = \Phi_\Pi \pi_t + \Phi_y y_t + \Phi_u \mu_{t.} + (1 - \rho_h)ht \quad \text{(Eq.10)}$$

Taylor's rule shows that the optimal inflation rate will rise. The argument posed by Baker et al. (2020), Baqaee and Farhi (2021), and Guerrieri et al. (2020) is that the Phillips curve would generate a smaller rise in inflation and more loss in output. Guerrieri et al. (2020) argued that inflation is less responsive to changes in interest rates when the slope of the Phillips curve is low, making the monetary policy less effective. The combination of the cost-push shock and weak personal consumption expenditure due to the COVID-19 containment measures depressed consumers' confidence in a manner that variation in interest rate could not stimulate economic activities enough to cause changes in the level of economic activities. Baker et al. (2020) and Guerrieri et al. (2020) explained that the variations in the expectation of inflation have a feedback effect on the output gap, which dampens AD.

Gravelle, Hungerford, and Labonte (2009) argued that fiscal stimulus is effective if it drives AD. On the one hand, monetarists argue that fiscal stimulus diverts transfers from domestic consumption spending to savings or leakages in the form of remittances to recipients abroad, which reduces the spending multipliers. On the other hand, Jomo and Chowdhury (2020) argued that the unprecedented nature of the Coronavirus pandemic generated uncertainties and discouraged household spending and business investment, as apprehension compels the holding of cash savings for future exigencies. Thus, they argued that "resources made available by the government in rich countries were spent because of the uncertainty about the future and reduced spending options, resulting in a situation similar to a Keynesian liquidity trap" (Jomo & Chowdhury, 2020, p. 232). However, Fornaro and Wolf (2020) offered a counternarrative that monetary policy could only do little because the policy rate is constrained by the zero lower bound; hence, aggressive fiscal intervention can avert stagnation and expand AD. These divergent views and research gaps inspired the undertaking of this study to empirically analyze the COVID-19 stimulus using the Keynesian and monetarist models to compare their outcomes.

Related Literature

The results in recent literature, including those of Baker et al. (2020), Chetty et al. (2020), and Casado et al. (2020), support the classical Keynesian theory. However, the full effects of the stimulus on economic activities remain inconclusive because of the ongoing nature of the pandemic. The authors' evidence suggests that the automatic stabilizers, countercyclical policies, and Ricardian equivalence are not effective short-term panacea to the COVID-19 shock. Hence, this study empirically explores these research gaps and ascertains the link between the transfer programs and DPI, PCE, and UR to determine if the free-market approach is a viable alternative

to the Keynesian model. A plethora of evidence of the successful application of the Keynesian theory to manage shocks exists in the literature.

Nevertheless, it is appropriate to check if the new dataset supports the outcomes of the ideas in the literature. In addition, the study also checks if the stimulus amount and number of rounds are adequate to yield a similar effect to past experiences. Zacharias, Masterson, and Kim (2008) and Gravelle, Hungerford, and Labonte (2009) discussed the rationale extensively, noting that the Obama Administration used ARRA as a fiscal measure to address the 2008 Great Recession, combine transfers and tax cuts to provide relief to low-income families, and bailed out distressed firms to stimulate aggregate demand. For example, Parker et al.'s (2013) evidence indicates that the 2008 stimulus program lasted three months and raised PCE by 2.3%, shifting the partial equilibrium of demand for nondurable goods from $33 billion to $80 billion in the second quarter of 2008.

Keynes's (1936) evidence shows that stimulus models rely on fiscal authorities, whereas that of Friedman (1968, 1982) indicates that monetary expansion depends on variations in interest rates, money supply, and debt management. Keynes (1936, 1937) posited that liquidity unleashes the animal spirit, the propensity that drives personal consumption expenditure, thus forming the Keynesian theory's conceptual foundation. Alternatively, Freidman reinforced Hayek's free-market view that lowering interest rates to increase money supply will increase liquidity (Freidman, 1982). Bordo and Rockoff (2013) found that "lowering the interest was more effective in managing the aggregate demand and supply shock to boost private-sector demand" (p. 8). Thus, they buttressed the monetarists' view that fiscal measures cannot provide the desired panacea for the COVID-19 shock. For example, Fornaro and Wolf (2020) found that the monetarist model could sustain demand and generates multipliers that reverse the supply-demand loop. A near

consensus among monetarists is that changing nominal interest variables increases higher demand for liquidity which stimulates investment spending, sustains consumers ' expectations for future income, and boosts consumers' confidence (Baker et al., 2020; Baqaee & Farhi, 2021; Bernanke et al., 2005; Casado et al., 2020; Fornaro & Wolf 2020). Altig et al. (2020) contested these views by finding that a high level of uncertainty does not bode well with monetary policy for rapid recovery because firms and consumers are cautious and curtail investments, hiring, and spending on durable goods.

Suppose the economic impact of COVID-19 is unequal among economies and groups, as found in Susskind and Vines (2020), Elgin, Basbug, and Yalaman (2020), and Savalanli (2021). In that case, it is imperative to consider factors that affect these groups before choosing a policy approach. Fornaro and Wolf (2020) explained that keeping money cheap would attract more investment, increase AD, and incrementally increase economic activities. They reinforced Freidman's (1982) position on monetarist restraints to maintain fiscal discipline (Fornaro and Wolf, 2020). The monetarist model hinges on the premise that "an increase in the supply of money will cause a proportionate increase in the price level" (Gwartney et al., 2018, p. 285). It implies that price (p) drives output (y), stimulating higher private-sector activity. In addition, the higher multiplier of consumer spending (M) produces a higher velocity (V) in the monetary transmission mechanism, thus pushing the economy to the path of fast recovery in the short run. However, "money becomes a veil, and monetary policy is neutral in the long run" (White, 2012, p. 315; Krugman, 1997). Thus, the monetary transmission mechanism assumes the form $MV = PT$.

Keynes (1936, 1937), Stilwell and Primrose (2010), and Baker et al. (2020) used various quantitative methods to show that recession creates recessionary gaps in the short run. Eggertsson (2011), Pedrosa and Farhi (2015), Krugman and Wells (2017), and Mankiw and Reis (2018)

empirically demonstrated that expansionary fiscal policy shifts the AD curve rightward to cover the recessionary gap faster than the monetary policy to restore the economy to full potential. Therefore, the Keynesian model could provide a quick growth stimulant for a depressed economy struggling with the COVID-19 shock. This evidence holds in the recent literature. Chetty et al. (2020) and Casado et al. (2020) found significant aggregate effects of the COVID-19 stimulus on spending and economic activities. For example, spending increased significantly among low-income households in May 2020 after April's first round of stimulus payments.

A careful review of various works on Keynesian and monetarist models and their applications in managing shocks, including the COVID-19 pandemic, provides a broad and valuable theoretical grounding for this study. In addition, the related literature offers the framework for the research design and methods of analysis to address the research questions under the two models. The Keynesian perspective on managing the COVID-19 pandemic is founded on Keynes's (1936) theory that fiscal stimulus provides liquidity to stimulate demand. The Keynesian idea is that cash transfers and the injection of money into the economy boost AD and consumer confidence, as expected from the CARES Act. Parker et al. (2013) noted that "in the winter of 2007–2008, facing an increasingly severe financial crisis and limitations of traditional monetary policy, Congress and the Administration turned to fiscal policy to stabilize the U.S. economy" (p. 2530). Stilwell and Primrose (2010) explained that increased spending during an economic crisis reestablishes investor and consumer confidence and stimulates AD in the short run. Figure 3 in the Appendix illustrates that the pandemic needed a stimulus to increase DPI and PCE to generate higher MPCs to increase AD significantly. Baker et al. (2020) explained that the U.S. government projected the $2 trillion CARES Act of 2020 to produce a double multiplier effect.

In contrast, the monetarist model is rooted in Freidman's theory that reducing interest rates and reserve requirements increase the money supply and liquidity. These controversies between the Keynesians and monetarists could be solved empirically using the finite difference method from Chen, Liu, and Burrage (2008) to solve the boundary difference between the two models. Mankiw and Reis (2018) and Nakamura and Steinsson (2018) suggested using the structural shocks and their causal effects to investigate how the multipliers translate into economic activities and identify plausible exogenous variations. This study used the relevant research questions to measure the causal impact of the explanatory variables on the dependent variable.

Summary

The COVID-19 pandemic, a severe health crisis, continues to cause micro-level demand and supply changes, culminating in significant changes in AD and AS. The pandemic exhibits the combined features of both demand-side and supply-side shocks. It severely affects society's ability to produce goods and services (Andolfatto, 2021). The pandemic disrupted the global supply chain operations, an explicit feature of a supply shock. Barret et al. (2020) described the nature of the COVID-19 shock as a supply shock that created a demand shock. Regardless of the theoretical purview, there seems to be a consensus among analysts that the pandemic constrained liquidity, weakened consumer confidence, depressed AD, and affected suppliers' productivity. Thus, it imposed higher economic costs on vulnerable individuals, households, and firms (Baker et al., 2020; Baqaee & Farhi, 2021; Carlsson-Szlezak, Reeves, & Swartz, 2020; Chetty et al., 2020). Therefore, it is expedient to use appropriate policy responses to mitigate the severity of the pandemic's economic impacts. The Keynesian idea is that fiscal spending can stimulate the economy by raising consumer confidence. Still, the findings of O'Reilly and Perret (2020) suggest that fiscal measures could encourage demand and incentivize behavior congruent with the desired

policy goal. The monetarists believe that varying interest rates and money supply help steer the economy in the desired direction (Krugman & Wells, 2017). The monetarist argument is that monetary policy can serve as a contractionary and expansionary measure in the short run. Yet the evidence in Kan (2021) shows that the COVID-19 shock is a cost-push shock with a trade-off between inflation and output in policymaking. The monetarists are skeptical that fiscal measures alone can sufficiently address severe shocks. Their argument resonates with Fornaro and Wolf's (2020) policy question of what constitutes the optimal economic policy. This study seeks to use appropriate metrics for gauging the optimality of the Keynesian and monetarist models for addressing the issues raised in the research question.

CHAPTER THREE: METHODS

Overview

This study used a mixed method research design under the positivist paradigm to test the Keynesian and monetarist models' COVID-19 response outcomes. In Tolley et al.'s (2016) words, "positivist paradigms provide researchers with a set of unified principles and rules in conducting research" (p. 18). Denver and Frankel (2000) described the positivist paradigm as the researcher's rough sketch as the inquiry proceeds. Tolley et al. (2016) noted that positivists believe that reliable knowledge comes from direct observation or manipulation of natural phenomena through empirical or experimental means. Therefore, the positivist paradigm uses quantitative models to introduce the principles of objectivity, explanation, verification, and prediction to analyze observations. The quantitative analysis utilized secondary data from relevant agencies to analyze the economic effects of the COVID-19 pandemic. A mixed method research design in a positivist paradigm makes it possible to scientifically investigate the research questions and explore the gaps in the literature. Mitchell and Jolley (2010) identified three critical criteria that help infer that a variable or set of variables causes a change in another variable: "specifically, you must establish covariation, temporal precedence and changes are not due to something other than the suspected cause" (p. 505).

A mixed method research design satisfies these criteria by combining quantitative and qualitative methods in a self-supporting way, as Specht (2019) described. Reinforcing Creswell's (1999) view, Specht (2019) noted that "combining quantitative and qualitative methods in a way in which they support each other help you reach a more concrete conclusion" (p. 138). A mixed method design avoids the problem of obscuring the conceptual distinction between the scientific investigation tool and the principles that determine how to deploy and interpret it. Creswell (1999)

explained that triangulation, a unique feature of the mixed method study, "uncovers some unique variance neglected by a single method" (p. 467). Like most policy research, this study categorized variables of interest, then collected and analyzed relevant data. In addition, this research used a similar investigation procedure to that used by Meier, Brudney, and Bohte (2015), as modified by Baker et al. (2020), Chetty et al. (2020), and Baqaee and Farhi (2021), to develop the research design and operationalize the data to test the causal relationship between the dependent and explanatory variables. As Tolley et al. (2016) and Baker et al. (2020) suggested, a mixed-method design is valuable in combining two or more methods using triangulation and drawing a conclusion from the synthesis of the results. The mixed techniques used by Baqaee and Farhi (2021) improved the internal validity of the research process and findings.

Research Questions

The research questions aimed to provide insight into the stimulus model's efficacy in filling the research gaps in the pandemic-related literature. The study investigated the outcomes of the measures used by the U.S. government to manage the impact of the Coronavirus to ascertain if the Keynesian stimulus or the monetarist approach delivers a more desirable result. The research question driving this study is: Did the fiscal measures under the CARES Act and subsequent stimulus measures produce the desired outcome? Therefore, to address this question, the sub-questions **RQ1**, **RQ2**, **RQ3**, and **RQ4** discussed under the Keynesian model in Chapter 1 provided the conceptual and empirical imperative to evaluate the use of the Keynesian model to address the Coronavirus shock. Monetarists, including Milton Freidman (1968) and Fiebiger and Lavoie (2018), argued that reducing interest rates to increase money supply makes borrowing attractive and stimulates consumption and investment spending. White (2012) noted that the monetarists' idea is to "restate theoretically, apply empirically and explain the policy implications of the

quantity theory of money" (p. 320). Thus, it is imperative to empirically examine the monetarist theory to further elucidate its argument by analyzing the sub-questions **RQ1**, **RQ2**, **RQ3**, and **RQ4** discussed under the monetarist model in Chapter 1.

Hypotheses

The research questions were tested with a set of hypotheses to predict the relationships between the dependent variable (percentage change in GDP) and the explanatory variables to test the consistency of the theoretical conception with the empirical data in the two models. Creswell (1999), Mitchell and Jolley (2010), and Meier, Brudney, and Bohte (2015) suggested the use of an alternative or research hypothesis (H_a) to predict the relationships, while the null hypothesis (H_0) tests and indicates no effect between the dependent and explanatory variables. Therefore, the alternative or research hypothesis contradicts the null hypothesis to predict the relationships in each model to address the research questions. The research questions and related hypotheses for the Keynesian model are:

RQ1: How much, if at all, does the change in DPI from direct government transfer payments raise the GDP?

$H_0$1: There is no statistically significant relationship between DPI and the percentage change in GDP.

H_a1: There is a statistically significant relationship between DPI and the percentage change in GDP.

RQ2: To what extent does the increase in PCE correlate with the changes in economic activities?

$H_0$2: There is no statistically significant relationship between PCE and the percentage change in GDP.

H_a2: There is a statistically significant relationship between PCE and the percentage change in GDP.

RQ3: To what extent does the change in the UR due to COVID-19 correlate with economic activities?

$H_0$3: There is no statistically significant correlation between the UR due to COVID-19 and the GDP percentage change.

H_a3: There is a statistically significant correlation between the UR due to COVID-19 and the GDP percentage change.

RQ4: To what extent does the absence of government intervention lead to increased economic activity?

$H_0$4: There are no statistically significant relationships between DPI, PCE, and UR due to COVID-19 jointly and the percentage change in GDP.

H_a4: There is a statistically significant relationship between DPI, PCE, and UR due to COVID-19 jointly and the percentage change in GDP.

The hypotheses for the monetarist theory attempt to empirically examine the consistency of the expansionary monetary policy theory with data to analyze the research questions and further investigate the monetarist model. The hypotheses for the monetarist model are:

RQ1: To what extent does the interest rate (INT) reduction raise the GDP growth rate?

$H_0$1: There is no statistically significant relationship between the INT and the percentage change in GDP.

H_a1: There is a statistically significant relationship between the INT and the percentage change in GDP.

RQ2: To what extent does the UR correlate with GDP change?

$H_0$2: There is no statistically significant relationship between the UR and the percentage change in GDP.

H_a2: There is a statistically significant relationship between the UR and the percentage change in GDP.

RQ3: To what extent does the inflation rate (IFL) correlate with GDP change?

$H_0$3: There is no statistically significant relationship between the IFL and the percentage change in GDP.

H_a3: There is a statistically significant relationship between the IFL and the percentage change in GDP.

RQ4: To what extent does the absence of monetary policy intervention or free-market approach in the short run lead to increased economic activities?

$H_0$4: There is no statistically significant relationship between INT, UR, and IFL jointly and the percentage change in GDP.

H_a4: There is a statistically significant relationship between INT, UR, and IFL jointly and the percentage change in GDP.

Participants and Setting

Participants

Creswell (2013), Meier, Brudney, and Bohte (2015), and Tolley et al. (2016) noted that the research design and methodology of a study determine the setting and participants in the data collection, encoding, analysis, and interpretations. Following these procedures, this study relied mainly on a quantitative approach to obtain reliable data with sufficient validity to test the consistency of the theories, then employed qualitative data collection techniques, mainly interviews, to validate the empirical results. In addition, Tolley et al. (2016) and Wilkinson et al.

(2021) explained that the involvement of other participants in mixed method research is to assess expert views and current practices to deepen the understanding of the data through the triangulation of results from data collected from various sources.

Similarly, the study interviewed participants, including economic and policy analysis experts, about their views on the efficacy of the Keynesian and monetarist approach to the COVID-19 shock. The study maintained a high level of objectivity in collecting and analyzing the data but followed the recommendation of Creswell (2013) to integrate the phenomenological approach in selecting the five participants. Creswell (2013) recommended that the ideal sample size in phenomenology ranges from three to fifteen. Wilkinson et al. (2021) suggested that participants be purposefully selected to reflect their knowledge and strategic contribution to the field. The researcher used purposive sampling, a non-probability sampling method like that used by Baqaee and Farhi (2021) and Wilkinson et al. (2021), to select five participants. All five participants earned Ph.Ds. in economics but varied in terms of their years of experience, area of specialization, location, and practice. The reason for this choice of variety was to obtain a diverse expert opinion on the two approaches to managing the COVID-19 shock.

Three participants were interviewed in person, while the other two were interviewed through telephone calls. They were asked questions similar to the research questions under the Keynesian and monetarist models to obtain their objective assessment of the U.S. government's approach to managing the economic impact of COVID-19. Detailed notes were taken of each participant's responses to the questions, while codes were assigned to the participants to protect their identity, as indicated in Table 1.

Table 1: Description of Participants					
Pseudonym	**Degree**	**Area of Economics**	**Geographic Location**	**Years of Experience**	**Practice**
R1	Ph.D.	Applied Economics	New Mexico	> 38	Prof. / Dir. of Policy Research
R2	Ph.D.	Macroeconomics	Texas	>22	Professor / City Mayor
R3	Ph.D.	Financial Economics	Texas	>24	Professor
R4	Ph.D.	Development Economics	North Carolina	8	Director of City Economic Dev.
R5	Ph.D.	Economics and Agricultural Policy	California	14	Professor / Dir. of Ag. Policy

Setting

Expert opinion is a critical element of qualitative analysis. Following the customary practice in mixed method studies, the researcher interviewed experts knowledgeable in the diverse fields of economics and policy analysis. This research relied mainly on a quantitative approach to obtain reliable data with sufficient validity to test the consistency of the theories. The involvement of other participants is valuable and helps to compare expert views and current practices with the deductions from the data. The study maintained a high level of objectivity in collecting and analyzing the data but followed the recommendation of Creswell (2013) to integrate the phenomenological approach to select the five participants. Consistent with Creswell's (2013) recommendation, the ideal sample size in phenomenology ranges from three to fifteen. The participants were purposefully selected to reflect their knowledge and strategic contributions to the field of economic policy analysis.

Instrumentation

As mixed-methods research, this study relied significantly on a quantitative approach to analyze the critical policy concern. The study used a similar approach to Tolley et al. (2016) to collect data on the variables of interest. In addition, this research employed the procedures of

Casado et al. (2020), Chetty et al. (2020), Fornaro and Wolf (2020), and Baqaee and Farhi (2021) to gather time series data from the pre-pandemic period to the currently available data from primary sources. Monthly time-series data were gathered from the BEA, the BLS, and the Fed from July 2019 to May 2022 of the percentage changes in GDP, DPI, and PCE as well as the UR, INT, and IFL. The percentage changes in the DPI, PCE, and UR are the explanatory variables in the Keynesian Model.

In contrast, the monetarists model's independent variables are INT, IFL, and UR. The percentage change in GDP is the dependent variable in both models. As in Creswell (2013) and Meier, Brudney, and Bohte (2015), the data was collected, coded, and run using MR as a parametric test. The interview responses of the participants selected through a purposive non-probability sample were analyzed and compared with the empirical results under the two models.

Procedures

The study followed the critical steps suggested by Mitchell and Jolley (2010) and Creswell (2013) to develop empirical models to test Keynesian and monetarist theories. First, the identified variables were defined and operationalized before testing the empirical models' consistency with the data since correlation does not imply causation, and data without theory is treacherous. Thus, the empirical model provided the quantitative imperative to establish the link between the theory and the data. Like the approach of Dorn (2019), Baker et al. (2020), and Fornaro and Wolf (2020), the variables' conceptual and operational definitions helped to explain the predictability of the change in economic activities caused by these explanatory variables. The conceptual and operational definitions helped to establish consistency between the theory and the data.

Moreover, MR helped determine the causal relationship between the monthly percentage change in GDP and the explanatory variables in both models. MR describes the linear relationship

between multiple predictor variables and the dependent variable to explain their causal effects on the changes in the single dependent variable. For example, in Shine et al. (2018), fiscal variables such as tax cuts and increased government spending significantly impacted the GDP growth rate. In contrast, the evidence in Benzeval et al. (2020) suggests that fiscal measures had a significant effect in 2020 compared to the pre-COVID-19 baseline. The primary regression equation (Eq.11) is the empirical framework used to test the Keynesian and monetarist theories. The basic MR equations took the form expressed below:

$$Y = c + b_1 * x1 + b_2 * x_2 \ldots\ldots + e_i \quad \text{(Eq.11)}$$

where Y is the estimated dependent variable, c is the intercept, b is the regression coefficient of the predictors x (independent variables), and e is the error or stochastic term. Therefore, Eq.11 provides the standard theoretical form to fit the MR model's specification for the two theories. Next, a normality test was carried out to ensure that the data were normally distributed and had no outliers. No outliers were detected; hence, using any quantitative measure for corrections was unnecessary. After completing the normality test, the Keynesian Model was modified and augmented as:

$$Per\triangle GPD = C + b_1 * Per\triangle DPI_1 + b_2 * Per\triangle PCE_2 + b_3 * UR_3 + E_i \quad \text{(Eq.12)}$$

where $Per\triangle GPD$ is the percentage change in GDP, C is the intercept, $per\triangle DPI$ is the percentage change in the DPI, $Per\triangle PCE$ is the percentage change in PCE**,** UR is the unemployment rate, and E_i is the random or stochastic error.

Augmentation of the basic empirical model is necessary to avoid methodological issues associated with policy evaluation. Taylor (2011) noted that "estimated macroeconomic models used for policy evaluation have basic mechanism built in them" (p. 687). The reason for augmenting Eq.11 is that empirical models differ significantly in their predictions of policy

outcomes due to different assumptions about MPC, expectations, the extent of consumption, and the unintended effects such as the speed of price adjustment and the crowding-out impact of government spending. For example, augmenting the historical Keynes-Hansen-Samuelson multiplier-accelerator model by incorporating a life-cycle savings model reduced the stagnation effect quantitatively. However, it did not negate the quantitative intuitions of Hansen and Keynes **(**Samuelson, 1988**)**. Recent literature, including research by Baker et al. (2020) and Chetty et al. (2020), considered the conceptual idea of the Keynesian countercyclical fiscal policy that a depressed AD caused by a decline in investment can be offset by increasing government spending or temporary transfer stimulus. Like the Keynesian model, the alternative monetarist model was modified and augmented as:

$$Per\triangle GPD = C + b_1 * INT_1 + b_2 * IFL_2 + b_3 * UR_3 + E_i \qquad (Eq.13)$$

where INT_1 is the monthly federal fund interest rate, IFL_2 is the monthly inflation rate, UR_3 is the monthly unemployment rate, and E_i is the random or stochastic error.

These modified empirical models provided the quantitative framework to evaluate the Keynesian argument that stimulus payments raise DPI and stimulate consumption to prevent a recession or fast-track recovery. In addition, the modified models helped to examine the monetarists' counterarguments arising from doubts about the reliability and stability of fiscal measures when the stimulus is temporal. Furthermore, the research design provided the appropriate methodology to test the Keynesian and monetarist hypotheses. Finally, the empirical results helped to articulate and interpret the economic impact of the COVID-19 pandemic. The null hypothesis for the Keynesian model was that there is no statistically significant predictive relationship between the percentage change in GDP and the percentage changes in DPI, PCE, and UR. The

alternative hypothesis was that there is a statistically significant predictive relationship between the percentage change in GDP and the percentage changes in DPI, PCE, and UR. The null hypothesis for the monetarist model was that there is no statistically significant relationship between the percentage change in GDP and INT, IFL, and UR. The alternative hypothesis was that a statistically significant predictive relationship exists between the percentage change in GDP and INT, IFL, and UR.

Data Analysis

Definition, Description, and Sources

This section of the study focuses on the data of the percentage change in the real GDP and the percentage changes in DPI and PCE, UR, INT, and IFL. The theoretical foundations of the Keynesian and monetarist models, as well as evidence in the literature, including the studies by Baker et al. (2020), Chetty et al. (2020), and Baqaee and Farhi (2021), influenced the choice of the six variables selected for this study. The variables are the percentage change in the real GDP, percentage change in DPI, percentage change in PCE, the unemployment rate, the federal fund interest rate, and the inflation rate. In addition, secondary data was collected from different primary sources, including the BEA, the BLS, the Fed, and the Coin News U.S. inflation calculator. The electronic retrieval of the primary data made the fieldwork associated with quantitative data collection a reliable and straightforward process. Quantitative datasets were downloaded from the relevant internet web pages of the primary sources. The data of the variables had a population size (*N*) of 31, totaling 124 pooled data points for each model. The data collected were monthly time series data from July 2019 to January 2022, the most recent, for the analysis of the Keynesian and monetarist models.

Table 2: Variable, Definition, Form, Description, Units, and Sources of Data				
Variable	Form	Description	Units	Source
Per△GPD	percent	The average of the percentage change in GPD from previous quarter	US ($'Billion)	BEA
Per△DPI	percent	The percentage change in DPI from previous month.	US ($)	BEA
Per△PCE	percent	The percentage change in PCE from previous month.	US ($)	BEA
UR	percent	The monthly rate of unemployment	Scale of 0 to 100 percent	BLS
INT	percent	The monthly federal funds interest rate	Scale of 0 to 100 percent	The Federal Reserve Bank (Fed)
IFL	percent	The monthly inflation rate	Percentage	The Fed and the Coin News U.S. inflation calculator

Table 2 provides detailed information about the variables, including the data description, forms, the units used to measure the data, and the data sources. The study used the percentage change in the monthly real GDP to measure economic activity changes after the first COVID-19 case was diagnosed in the U.S. and the interventions to mitigate its economic impact. The study used percentage change in GDP as the dependent variable in both the Keynesian and monetarist models. The explanatory variables in the Keynesian model were the percentage change in DPI, the percentage change in PCE, and the UR. Their data exist in standard forms that explain how fiscal measures caused economic activity changes. The independent variables for the monetarist model are the UR, the federal fund interest rate, and the inflation rate. These datasets exist in the same standard form and do not require transformation. The data enabled the researcher to determine the impact of monetary expansion on economic activity.

The data for these variables were collected directly in their standard forms from reliable primary sources, tabulated, and organized as a pooled time series dataset. The dataset was

organized correctly and visualized, as shown in Tables 3 and 4 in the Appendix and Figures 1 and 3. The data was used to measure the two policy approaches' direct effect on the Keynesian fiscal measures and monetary expansion. Using the dataset of variables unique to the Keynesian and monetarist models helped test both models' conceptual frameworks with actual data. For example, Nakamura and Steinsson (2008) showed that using model-specific variables can help isolate the effect of the outcome of one model compared to the result of the other. A similar approach was used in Taylor (2011) and Benzeval et al. (2020) to avoid using dummy variables to explain the behavior of two variables under different methods. The datasets appropriately measured the outcomes of the two policy approaches and compared them to assess their relative efficacy. Moreover, evaluating the Keynesian model's unique features made it possible to compare the results with those of an alternative model.

Data Collection and Analysis Procedures

The study collected the monthly time series data from July 2019 to the most recently available data in May 2022 to measure the effects of fiscal transfers and monetary policy on economic activities during the ongoing COVID-19 pandemic. The data are presented in Tables 2 and 3 in the Appendix and visualized in Figures 1 and 2. The percentage change in GDP (***Per⊿GPD***) was computed by comparing the size of GDP to the previous quarter (BEA, 2021). However, the average for the three months was taken as the monthly percentage change. BEA used this method to measure the federal recovery program because it reports the quarterly real GDP data. The percentage change in GDP measures the policy impact on economic activities. Therefore, change in economic activities is measured as the percentage change in real GDP. Baker et al. (2020) used the average quarterly reported data to avoid calibrating demand and supply shocks. Baqaee and Farhi (2021) noted that the intertemporal and intersectoral elasticities of

substitution from the realized short-term spending from BEA statistics fit well in models of the demand shock.

The percentage change in DPI measured the effect of the multipliers from the stimulus that households and small businesses received. This study identified the payments under the CARES Act and subsequent stimulus programs, including tax refunds, deposits, government income, and credits, to measure their effect on the DPI of people and small businesses. Pollitt et al. (2020) and Baqaee and Farhi (2021) acknowledged that the percentage change in DPI estimates the extent of the liquidity fiscal and monetary policies provide to stimulate the economy. Therefore, the changes were measured on a scale of 1%–100%. In addition, BEA calculated the percentage change in DPI to identify the changes that occurred in DPI the preceding month.

The unemployment rate (UR), which measures the number of unemployed civilian workers aged 16 years and above, was generated from the monthly data reported by the BLS. The BLS computes national unemployment statistics from its Current Population Survey (CPS), which surveys households monthly and uses jobless insurance benefit claims to produce monthly unemployment data (BLS, 2021). The BLS measures the unemployment rate as the percentage change in the unemployed workers compared to the labor force. However, the BLS considers those actively seeking jobs as a criterion for measuring employment and excludes discouraged workers. The UR shows the relationship between the policy interventions and employment in both models. This study relied on the BLS employment data to avoid confounding problems and self-selection bias. The study strictly employed the BLS data for an objective assessment.

Interest rate (INT) measured the effect of the Fed's monthly federal funds interest rate variations on monetary expansion. The dataset was downloaded from the Federal Reserve Bank of St. Louis website. The federal funds rate is the interest rate at which depository financial

institutions trade their balances held by the Fed (Federal Reserve Bank of St. Louis, 2021). The federal fund's interest rate determines the rate at which banks with excess liquidity lend to other banks that need to raise liquidity quickly. The Fed measures the interest rate on a scale of 1%–100%. Thus, the interest rate measures monetary policy's effect on the liquidity supply for investment and consumption spending.

The inflation rate (IFL) is a variable that gauges the increase in the general prices of goods and services over time (The Federal Reserve Bank of St. Louis, 2021). The Fed uses price indexes to measure price changes in a group of goods and services. The inflation rates were downloaded from the Federal Reserve Economic Data (FRED) and the Coin News U.S. inflation calculator websites. The Fed reports the inflation rate monthly using a well-known indicator, the CPI, which measures the percentage change in the price of the basket of goods and services households consume. In the monetarist model, the inflation rate measures the extent to which monetary expansion causes a rise in the general price level.

CHAPTER FOUR: FINDINGS

Overview

The results of the MR were interpreted and used to address the research questions and test the hypotheses for the two models. The data analysis in the Appendix suggests that the two models' outcomes are consistent with their conceptual framework. The findings of the Keynesian model are compatible with the results in Baker et al. (2020) and Chetty et al. (2020) but provide new evidence that suggests a potential leakage in the transfer that could divert spending from consumer goods and services to forced savings. The result shows that the percentage change in DPI declined a month after the round of stimulus payments, whereas the percentage change in PCE significantly rose a month afterward. From December 2020 to June 2021, after two rounds of stimulus transfers, the percentage changes in DPI and PCE showed a positive correlation. In the monetarist model, interest rate and inflation showed a stronger negative correlation after November 2020; inflation rose significantly while the interest rate remained stable. In March 2021, the inflation rate and change in GDP diverged and maintained that trend until December 2021, when they seemed to begin to converge.

The empirical results of the Keynesian model are consistent with the theoretical framework; consistency between the theory and empirical statements strengthens a policy research's validity. Further data from July 2021 to January 2022 provided insight into the need for proper targeting of stimulus, thus raising the concern of whether the transfer's effects on DPI have minimal behavioral effects. The COVID-19 shock is not yet over; the economic impact is still ongoing, new data are becoming available, and the time lag of policy reveals new outcomes. As more data becomes available, trends from observations will provide a qualitative imperative to complement the recent empirical evidence to provide a broad perspective to look at the efficacy of

the Keynesian model stimulus and monetary expansion from a multidimensional spectrum. The quantitative result is expected to reinforce the qualitative evidence and support the relationships among the variables. Therefore, analyzing the empirical results and the participants' responses will help to assess the efficacy of the transfers in the Keynesian model and help to evaluate the impact of the increase in the money supply in the monetarist model to improve the study's internal validity.

Descriptive Statistics

Descriptive statistics summarize the dataset used in the estimations in both models. Meier, Brudney, and Bohte (2015) described descriptive statistics as the numbers used to summarize a group of data. They noted that descriptive statistics help restructure data to understand the mean in a frequency distribution (Meier, Brudney, & Bohte, 2015). George and Mallery (2018) explained that descriptive statistics provide information about the distributions of the variables. The descriptive statistics of the Keynesian model in Table 3 provide detailed information about the percentage changes in GDP, DPI, PCE, and the UR. In the monetarist model, the descriptive statistics provide detailed information about the percentage change in GDP and the explanatory variables, including the INT, IFL, and UR. Table 3 shows that the variables in both the Keynesian and monetarist models have positive mean, standard deviations, and variance values. However, the minimum values of the variables in both models were negative except for the positive unemployment rate, implying that during economic shocks such as COVID-19, percentage changes in GDP, DPI, and PCE experience broad fluctuations, creating a recessionary gap in the national output. Baqaee and Farhi (2021) explained that the volatility in the values of these variables rationalizes the need for pragmatic policy intervention to stabilize the economy.

Table 3: Descriptive Statistics of the Variables

Variables	N Stat.	Minimum	Maximum	Mean	Std. Deviation	Variance	Std. Error
The Keynesian Model							
PerΔGDP	31	-10.40	11.27	.9965	4.9791	24.791	.421
PerΔDPI	31	-15.30	23.60	.5581	6.4522	41.631	.421
PerΔPCE	31	-12.90	8.50	.4455	3.4808	12.116	.421
UR	31	3.50	14.80	6.042	2.8912	8.359	.421
Valid N	31						
The Monetarist Model							
PerΔGDP	31	-10.40	11.27	.9965	4.97909	24.791	.421
INT	31	-15.30	23.60	.5581	6.45222	41.631	.421
IFL	31	-12.90	8.50	.4455	3.48077	12.116	.421
UR	31	3.50	14.80	6.042	2.89123	8.359	.421
Valid N	31						

Source: Author's Multiple Regression Estimation in IBM SPSS with data from BEA – GDP, DPI, and PCE Outlays July 2019 – Jan. 2022. FRED, and Coin News, USA.

The coefficients in Table 3 provide a brief description and summary of the data used in the MR estimation. Table 3 shows that the variables were approximately normally distributed. However, the regressions' standardized residuals plots in the Appendix show that the variables' datasets were approximately normally distributed, satisfying the normality test. A normal

distribution has a sample size of not less than 30 (Creswell, 2013; George & Mallery, 2018; Nakamura & Steinsson, 2008).

Results

The results of the MR analysis provided the empirical evidence to test the relevant hypotheses for the Keynesian and monetarist models. The MR results were analyzed to address each research question. Creswell (2013), George and Mallery (2018), and Benzeval et al. (2020) noted that the linear MR models assume (a) the independence of the residuals; (b) the normality of the residuals; and (c) the constant variance of the residuals or homoscedasticity. These three conditions were the main assumptions of the MR analysis in the Keynesian and monetarist models. The Mahalanobis test helped to identify potential outliers.

In contrast, Cooks's test helped identify more substantial undue influence in the regression model to ensure that each predictor variable contributed similarly to the predicted output to avoid one variable from dominating the MR results. As suggested by Meier, Brudney, and Bohte (2015), Tolley et al. (2016), and Wilkinson et al. (2021), the zero-order correlation was used to predict the change in GDP. The zero-order correlation measures the relationship between variables from 0 to 1, with values close to 0 indicating a weak relationship, whereas values relative to 1 show a strong relationship. It implies that the percentage change in GDP (dependent variable) is measured by the change in the explanatory variables, including changes in DPI, PCE, and UR.

Thus, $\hat{y}$, or fitted y, as the change in GDP was measured as changes in the predictor variables X_1, X_2, X_3, where X_1 = DPI, X_2 = PCE, and X_3 = UR. Therefore,

$$\hat{y} = X_1 + X_2 + X_3 + E_i \quad \text{(Eq. 14)}$$

Table 4 presents the empirical evidence of the variables that influenced the percentage change in the real GDP of the U.S. during the period selected for this study.

Table 4: The Linear Multiple Regression Results
Dependent Variable: Per△GPD

Explanatory Variables	The Keynesian Model				Explanatory Variables	The Monetarist Model			
	Coef.	Std. error	Beta	T. stat		Coef.	Std. error	Beta	T. stat
Constant	4.36**	2.088		2.08 **	Constant	11.918**	4.987		2.39**
Per△DPI	-.029	.146	-.036	-.198	INT	-3.361**	1.655	-.533	-2.031*
Per△PCE	.104	.290	.065	.360	IFL	-.611	.594	-.254	-1.029
UR	-.56**	.314	-.327	-1.80**	UR	-1.223**	.476	-.710	-2.57**
N Statistics	31				31				
Observations	124				124				
R Square	.113				.229				
F Stat	1.142**				2.679				

Note: (1) Std. error is the standard error. (2) ***, ** and * means significant at 99%, 95% and 90% levels, respectively.
Source: Author's Multiple Regression Estimation in IBM SPSS with data from BEA – GDP, DPI, and PCE Outlays July 2019 – May 2022. FRED, and Coin News, USA.

Under the Keynesian model, the result provided new evidence that stimulus diverts disposable income from consumption to forced savings. In contrast, the PCE and UR were consistent with the fiscal stimulus theory. The result of the MR analysis of the monetarist model was marginally insignificant. However, INT and UR were significantly correlated with the percentage change in GDP.

The evidence presented in Table 4 indicates that the UR correlated with the percentage change in GDP. All the predictors in the Keynesian model were unbiased and approximately normally distributed. The coefficient of the UR was -0.563 and significant at a 95% confidence level. However, the correlation between the percentage change in GDP and UR was negative. The

R Square as the coefficient of correlation was used because multiple independent variables in the model jointly explain the dependent variable's percentage change. The standardized coefficients of *beta* for the independent variables in Table 4 on page 65 are the percentage change in DPI (-0.036), the percentage change in PCE (0.065), and the UR (-0.327). Creswell (2013) and Meier, Brudney, and Bohte (2015) explained that *beta* is used to describe how much change in the dependent variable is caused by the difference in each predictor variable. Therefore, the *beta* coefficient of the UR is consistent with the Keynesian theory.

The MR result of the Keynesian model had an *R Square* value of 0.113, *F* statistics of 1.142, and a significant *p*-value (< .05). The *R Square* shows how multiple independent variables in the model jointly explain the percentage change in the dependent variable. The standardized coefficients of *beta* for the independent variables in Table 4 are the percentage change in DPI (-0.036), the percentage change in PCE (0.065), and the UR (-0.327). *Beta* describes the change in the dependent variable that emanates from the changes in each predictor variable. The *beta* coefficient of the unemployment rate is consistent with the Keynesian theory. The empirical results in Table 4 on page 65 indicate that the three predictive variables in the Keynesian model correlated with the percentage change in GDP; they are unbiased and approximately normally distributed. The UR and INT coefficients are -1.223 and -3.361, respectively. Both were significant at a 95% confidence level. However, the correlations between them and the percentage change in GDP were negative. The values of the Pearson correlation coefficient in Table 8 of the Appendix on page 109 are INT (0.315), IFL (0.141), and UR (0.036). The residual plots in Figure 11 through Figure 14 on pages 118 and 119 in the Appendix show a moderate correlation between INT and percentage change in GDP. In contrast, they show weak correlations between the dependent variable and IFL and UR, respectively. The empirical results also indicate that no variable was removed. In addition,

no multicollinearity and heteroscedasticity were present. The MR result of the monetarist model in Table 4 on page 65 has an *R Square* value of 0.229, *F* statistics of 2.679, and a *p*-value > .05. Thus, this study examined the relationship between the predictor variables and the dependent variable in the monetarist model with their *beta* coefficients. The standardized coefficients of *beta* for the independent variables for the monetarists model in Table 4 on page 65 are INT (-0.533), IFL (-0.254), and UR (-0.710). The *beta* coefficients attribute the substantial change in the percentage change in GDP to the decreasing UR and INT in the monetarist model. However, the five participants' responses gathered through face-to-face and telephone interviews provided a qualitative imperative to gauge the empirical results and help analyze the hypotheses.

Participants' Responses

The research questions were used to frame the interview questions for the participants. Accordingly, the participants were asked 10 questions, including five in each model. The four research questions in each model helped obtain the participants' expert opinions on the efficacy of the policy outcomes under the Keynesian and monetarist models. The fifth question probed their assessment of the results of the fiscal and monetary policy measures in managing the COVID-19 shock. This is a practical demonstration of triangulation to obtain expert assessments from the field to validate the empirical result. Wilson (2014) noted that "triangulation refers to using more than one particular approach when researching to get richer, fuller data or help to confirm the results of the research" (p.74). Flick (2002) was specific in describing the triangulation approach. He explained that approaching the research data with multiple theories and scholarly perspectives helps extend the possibilities for producing knowledge (Flick, 2002).

Therefore, following the triangulation approach, the participants were asked the following questions under the Keynesian model:

I. Do you think the changes in households' disposable personal income (DPI) and support to small businesses from direct government transfer payments helped raise the GDP during the COVID-19 pandemic?

II. To what extent do you think increasing personal consumption expenditure (PCE) helps boost economic activities during the COVID-19 pandemic?

III. Do you think the changes in the unemployment rate due to COVID-19 correlate with the changes in economic activities?

IV. Do you think the absence of government intervention could increase economic activity?

V. What is your overall assessment of the government's use of fiscal intervention to address the COVID-19 shock?

Finally, the participants were asked five questions in the monetarist model to obtain their views and gauge whether their perspectives align with the empirical results. The questions are as follows:

I. To what extent do you think the interest rate (INT) reduction raises the GDP growth rate?

II. Do you think the falling unemployment rate (URat) resulting from money injection and altering the reserve requirements leads to GDP growth?

III. Do you think changes in the inflation rate (IFL) could be associated with the change in GDP growth?

IV. To what extent could the absence of monetary policy intervention lead to increased economic activities?

V. What is your overall assessment of the government's use of monetary policy measures to address the COVID-19 shock?

This research articulated the participants' responses to these interview questions into a practical qualitative measure to objectively assess the consistency of the data analysis. Additionally, these responses helped in analyzing the null hypothesis tests.

The Null Hypotheses

The null hypotheses analyze each research question to provide solutions to the problem under the empirical investigation. The standard practice in statistical analysis is to base the null hypotheses test on the p-value. Aczel et al. (2018) explained that under the null hypothesis significance testing (NHST) logic, one could reject the null hypothesis when the p-value is less than or equal to the predefined threshold set at 0.05. This implies that the researcher is expected to withhold judgment at any p-value above 0.05. Cheng et al. (2019) noted that a p-value is the probability of obtaining an effect at least as extreme as the one in the sample data, which assumes the truth of the hypothesis. However, Aczel et al. (2018) argued that "the p-value does not entitle one to claim support in favor of the null hypothesis" (p. 257). However, Creswell (2013) and Harrison et al. (2020) noted that the p-values are interpreted as the error rate estimate in rejecting the null hypothesis, implying that a p-value of 0.05 indicates the type I error probability of 5%. Harrison et al. (2020) argued that the actual error rate might range from 23 to 50% when $p = 0.05$ (p. 561) in isolated studies. Therefore, this study will apply the NHST to each variable tested in the hypotheses.

Assumption Tests

The null hypotheses test assumes that three main conditions, as in Creswell (2013), George and Mallery (2018), and Benzeval et al. (2020), are critical in testing the empirical validity of the answers to the research questions. The assumptions of the null hypotheses in both the Keynesian

and monetarist models are, I. The independence of the residuals, II. The normality of the residuals, III. The constant variance of the residuals or homoscedasticity.

These assumptions will be the basis of testing the hypotheses to evaluate each research question. Some limitations of the null hypotheses identified by Harrison et al. (2020) include a simplistic dichotomous interpretation of the p-value as either significant or insignificant; thus, the incorrect interpretation of $p > 0.05$, meaning no effect, and performing multiple tests without adjusting the criterion for the p-value. As such, this study took cognizance of these limitations when testing the model's variables using the research questions. Hence, the null hypothesis of each variable will be used to predict its effect on the dependent variable.

Hypotheses for the Keynesian Model

The linear MR results are subjected to an empirical test to evaluate the research question, address the problem statement, and satisfy the purpose of this research. The factorial ANOVA with three levels will help assess each variable's effect by calculating their student t-statistics. Cronk (2018) explained that "factorial ANOVA is valuable because it allows us to assess the effects of each independent variable, plus the effect of the interaction" (p. 82). The one-way ANOVA relying on the three main assumptions stipulated above will help identify the differences among the variables. Creswell (2013) and Cronk (2018) noted that the ANOVA is subject to posthoc analysis to determine the nature of the differences among the variables. The null hypotheses for the Keynesian model are as follows:

RQ1: *How much, if any, does a change in disposable personal income (DPI) from direct government transfer payments raise the GDP?*

- **$H_0$1***: There is no statistically significant relationship between disposable personal income (DPI) and the percentage change in GDP.*

- **H_a1***: There is a statistically significant relationship between disposable personal income (DPI) and the percentage change in GDP*.

An independent-sample test and the linear multiple regression results demonstrate that the coefficient of DPI (-.029) negatively correlated to the Per△GPD. No significant difference was found (t (3) = -.198, p > .05). We fail to reject the null hypothesis $H_0$1: there is no statistically significant relationship between DPI and the percentage change in GDP. Therefore, we reject the alternative hypothesis H_a1 instead and conclude that there is no statistically significant predictive relationship between DPI and the Per△GPD. This implies that a change in disposable income from direct stimulus does not significantly raise the GDP.

RQ2**:** *To what extent does the increase in personal consumption expenditure (PCE) correlate with the changes in economic activities?*

- **$H_0$2***: There is no statistically significant relationship between consumption expenditure (PCE) and the percentage change in GDP.*
- **H_a2:** *There is a statistically significant relationship between consumption expenditure (PCE) and the percentage change in GDP.*

The results of the independent-sample test of the MR on page 65 show that the beta coefficient of PCE (.104) positively correlates to Per△GPD. No significant difference was found (t (3) = .360, p > .05). We fail to reject the null hypothesis ($H_0$2): no statistically significant relationship exists between consumption expenditure (PCE) and the percentage change in GDP. Therefore, we reject the alternative hypothesis H_a2 and conclude that there is no statistically significant predictive relationship between PCE and the percentage change in GDP.

RQ3: *To what extent does the change in the unemployment rate due to COVID-19 correlate with economic activities?*

- **$H_0$3**: *There is no statistically significant correlation between the unemployment rate (UR) due to COVID-19 and the GDP percentage change.*
- **H_a3**: *There is a statistically significant correlation between the unemployment rate (UR) due to COVID-19 and the GDP percentage change.*

The MR results on page 65 demonstrate that the UR's beta coefficient (-.563) has a strong negative correlation with the Per△GPD. We found a significant difference ($t(3) = -1.796$, $p < .05$). Therefore, we reject the null hypothesis ($H_0$3) and accept the alternative hypothesis (H_a3), concluding that there is a statistically significant correlation between the UR due to COVID-19 with the Per△GPD. Hence, this implies that a 0.56 % decrease in UR leads to a 1% increase in the GDP holding other variables constant.

RQ4: *To what extent does the absence of government intervention lead to increased economic activity?*

- **$H_0$4**: *There are no statistically significant relationships between DPI, PCE, and UR due to COVID-19 and the percentage of change in GDP.*
- **H_a4:** *There is a statistically significant relationship between DPI, PCE, and UR due to COVID-19 and the percentage of change in GDP.*

This hypothesis tests the overall significance of the Keynesian model. The MR model was statistically significant and predicted the percentage change in real GDP significantly ($F(3,27) = 1.14$, $p < .05$). Moreover, the model has a mean score of .9965 (sd = 2.09) and an R square of .113. Therefore, we reject the null hypothesis $H_0$4: there is no statistically significant predictive relationship between changes in real GDP and changes in DPI, PCE, and UR. We accept the alternative hypothesis H_a4: a statistically significant relationship exists between DPI, PCE, and UR due to COVID-19 and the percentage change in GDP. Hence, an 11.30% variation in real GDP

is attributed to changes in the DPI, PCE, and UR. Ultimately, the hypothesis test addresses the fundamental research question and confirms that the Keynesian stimulus policy helps to replace the loss of income, reduces unemployment, significantly impacts economic activities, and alleviates the hardship of the COVID-19 shock.

Hypotheses for the Monetarist Model

Regarding the monetarist model, the hypotheses examined the consistency of the expansionary monetary policy with data to analyze the research questions and further investigate the model. The three main assumptions used in testing the null hypotheses in the Keynesian model apply to the monetarist model. The hypotheses for the monetarist model are as follows:

RQ1: *To what extent does the interest rate (INT) reduction raise the GDP growth rate?*

- **$H_0$1**: *There is no statistically significant relationship between the interest rate (INT) and the percentage change in GDP*.
- **H_a1**: *There is a statistically significant relationship between the interest rate (INT) and the percentage change in GDP*.

An independent-sample test was conducted. Table 4 on page 65 shows that the standardized coefficient of INT (-.533) is negative and moderately correlated with Per△GPD. No significant difference was found (t (3) = -2.031, p = .05). We fail to reject the null hypothesis $H_0$1: no statistically significant relationship exists between INT and the percentage change in GDP. Therefore, we reject the alternative hypothesis H_a1 and conclude that there is no statistically significant predictive relationship between the INT and the percentage change in GDP, implying that varying INT and money supply do not significantly raise the GDP during the pandemic.

RQ2: *To what extent does the unemployment rate (UR) resulting from money injection and altering the reserve requirements correlate with the change in GDP?*

- **$H_0$2**: *There is no statistically significant relationship between the unemployment rate (UR) and the percentage change in GDP.*
- **H_a2***: There is a statistically significant relationship between the unemployment rate (URat) and the percentage change in GDP.*

The MR results in Table 4 on page 65 show that the standardized beta coefficient of the UR (-.710) has a strong negative correlation with the Per△GPD. A significant difference was found (t (3) = -2.570, $p < .05$). We reject the null hypothesis $H_0$2: no statistically significant relationship exists between the UR and the percentage change in GDP. Therefore, we accept the alternative hypothesis (H_a2) and conclude that there is a statistically significant relationship between the UR and the percentage change in GDP. Hence, a 0.71% decrease in the UR leads to a 1% increase in the GDP holding other variables constant.

RQ3: *To what extent does the inflation rate (IFL) correlate with GDP change?*

- **$H_0$3***: There is no statistically significant relationship between the inflation rate (IFL) and the percentage change in GDP.*
- **H_a3***: There is a statistically significant relationship between the inflation rate (IFL) and the percentage change in GDP.*

The independent-sample test of the MR shows that the beta coefficient of IFL (-.254) is negative and has a weak correlation with the Per△GPD. No significant difference was found (t (3) = -1.029, $p > .05$). We fail to reject the null hypothesis $H_0$3: No statistically significant relationship exists between the IFL and the percentage change in GDP. Thus, variation in the INT and money supply has an insignificant impact on GDP during the pandemic.

RQ4: *To what extent does the absence of monetary policy intervention lead to increased economic activities?*

- **$H_0$4**: *There is no statistically significant relationship between INT, URat, and IFL jointly and the percentage change in GDP.*
- **H_a4**: *There is a statistically significant relationship between INT, URat, and IFL jointly and the percentage change in GDP.*

This hypothesis tests the overall significance of the monetarist model to empirically ascertain its efficacy during economic shocks such as COVID-19. The comprehensive MR model was not statistically significant and could not predict the percentage change in real GDP significantly ($F(3,27) = 2.679$, $p > .05$). The model has a mean score of .9965 (sd = 4.98) and an R square of .229. Therefore, we accept the null hypothesis $H_0$4: there is no statistically significant relationship between INT, UR, and IFL jointly and the percentage change in GDP. Instead, we reject the alternative hypothesis H_a4: there is a statistically significant relationship between INT, UR, and IFL jointly and the percentage change in GDP. Overall, the empirical evidence suggests that the monetary policy alone is ineffective in managing severe shocks such as COVID-19. Ultimately, the hypothesis test addresses the fundamental research question about the absence of monetary intervention and confirms that varying interest rates and money supply during severe shocks affect changes in the GDP but do not significantly impact economic activities or alleviate hardship.

Analysis of Participants' Responses

As a mixed-method research design study, this analysis addresses a critical policy issue and gauges the empirical results using expert opinions. Flick (2002) and Wilson (2014) discussed the rationale for this investigative approach. Triangulation aims to obtain an overall specialist opinion on the issue under investigation using multiple methods to validate empirical results with qualitative information to advanced knowledge. Additionally, the analyses of the participant's

responses to the interview questions will provide the qualitative imperative to analyze the research questions in the two models.

The Keynesian Model

The study used the following questions in the Keynesian model to obtain an objective policy assessment of fiscal measures employed by the government to address the economic impact caused by the COVID-19 pandemic. A concise response from each participant was articulated into a summary to address each interview question.

Question 1: *Do you think the changes in households' disposable personal income (DPI) and support to small businesses from direct government transfer payments help raise the GDP during the COVID-19 pandemic?*

The participants' responses were as follows:

R1: No, only if the households spent the increase in DPI on consumption expenditure, but support for small businesses tends to preserve a substantial number of jobs and help reduce the unemployment rate.

R2: Households' disposable income and thriving small businesses are the engines that run the U.S. economy. An increase in DPI of households and support for small businesses help sustain consumer confidence and help to keep the local and national economies virile to prevent another severe recession.

R3: No, a misdirected stimulus will not produce a significant multiplier from increased DPI that could impact economic activities positively. Instead, it is a trade-off between inflation and increased liquidity in the short run; it is a zero-sum game in the long run.

R4: Yes, the multiplier effect from increased DPI and the Paycheck Protection Program (PPP) has helped stabilize the economy from the COVID-19 shock.

R5: Yes, it will help address economic hardship, particularly among low-income households and struggling small businesses. It will help sustain agricultural production, address increasing rural poverty from the pandemic, and prevent small businesses from shutting down.

Three participants believed that the changes in the DPI of households and support to small businesses from direct government transfer payments help to raise the GDP during severe shocks such as the COVID-19 pandemic. Two participants disagreed with the government's policy of achieving a high DPI. Their rationale resonates with the policy question in Fornaro and Wolf (2020) of what constitutes the optimal economic policy. Hence, optimal interventions should target transfers appropriately to achieve the desired policy outcome. Their responses reinforce O'Reilly and Perret's (2020) view that fiscal measures could stimulate demand, but their implementation incentivizes inconsistent behavior with the desired public health goals. This view validates the outcome of the hypotheses test for ***RQ1*** under the Keynesian model. However, the other three participants' views align with Keynes's (1936) original idea that stimulus spending increases disposable income and output, thus causing an increased demand for money. However, the efficacy of transfer payments relies on the household's MPCs that influence consumer behavior (Baker et al., 2020; Baqaee & Farhi, 2021).

Question 2: *To what extent do you think increased personal consumption expenditure (PCE) helps boost economic activities during the COVID-19 pandemic?*

The participants' responses were as follows:

R1: The multiplier from PCE stimulates aggregate demand to a great extent, which could preserve or create new jobs. An increase in PCE unleashes the animal spirit, as economists would think.

R2: Chris, the importance of high PCE is the multipliers it produces. Increased consumer spending will result in more jobs if the MPC is high enough, but when forced savings or other leakages constrain PCE, it undermines PCE and national output.

R3: In theory, I would agree with the view that high PCE would induce economic activities, but the dilemma is real. If households spend on durable goods and settlement of old debts, it will divert PCE from small businesses to big corporations and from current expenditure to past debt.

R4: One of the programs the city council adopted to alleviate the economic impact of the pandemic is to assist very vulnerable low-income households. The argument was presented to the board to complement the federal stimulus to raise the PCE of these families because consumer spending is critical for the survival of the local economy.

R5: Yes, the rationale is not unfounded. Going back to ten economic principles, the circular income flow model is explicit about PCE. A slump in PCE would exacerbate the declining economic activities, but high PCE would boost the economy or prevent a potential recession.

The participants were sure that increased personal consumption helped boost economic activities during the COVID-19 pandemic. However, one participant doubted that increasing PCE could facilitate economic activities enough to restore macroeconomic stability without complementing it with other market-driven economic approaches. This view questions Keynes's (1936) assumption that consumption spending translates into increased economic activities. However, most of the opinions aligned with the theoretical foundation of the Keynesian theory. The idea in the literature, including Cheng (2015), Barker et al. (2020), Chetty et al. (2020), and Baqaee and Farhi (2021), is that multiplier of consumption spending (M) will induce a higher velocity (V) of money, which pushes the economy on a faster recovery path in the short run.

Overall, the empirical evidence shows a positive correlation between changes in PCE and GDP; however, the correlation was weak.

Question 3: *Do you think the changes in the unemployment rate due to COVID-19 correlate with economic activities?*

The participants' responses were as follows:

R1: Certainly, I agree with that notion. The essence of expansionary economic policy is managing business cycle changes. When the economy is hit with a severe shock, such as the current pandemic, the automatic stabilizers become ineffective; policy intervention becomes inevitable to close the output gap and restore the economy to equilibrium. Such policy intervention aims to achieve full employment to keep the economy at its potential.

R2: Yes, the stimulus business is about job creation and protection. Unemployment declines when jobs are protected or created, and more labor hours are devoted to economic productivity.

R3: I agree with this notion altogether. Yes, the unemployment rate is strongly related to changes in economic activities.

R4: As a city economic development director, my principal duty is to promote job creation and attract businesses. Employment is the key to economic growth. So, yes, the unemployment rate correlates with economic activities.

R5: This question touches on one of the essential objectives of rural agricultural and urban economic development policy. Income guarantees an average worker a wage to meet the cost of living. Employment is the means to provide income for nearly 90% of the labor force. Therefore, any policy that reduces unemployment contributes to productivity.

The participants' opinions reinforced the Keynesian goal of boosting economic activities with stimulus to reduce the unemployment gap and stabilize the economy. They believe that the

interventions reduced unemployment and preserved many jobs; hence, the unemployment rate correlates strongly with economic activities. These views validate Keynes's (1936) idea that stimulus is necessary to reinvigorate economic activities, restore consumers' confidence, and close the output gap to bring employment to its full potential. Eggerston (2005) evaluated FDR's fiscal policy approach to the Great Depression and found that the key to the recovery was the successful management of expectations, in which employment played a pivotal role. The qualitative evidence was consistent with both theoretical and empirical evidence. In the null hypothesis for **RQ3** under the Keynesian model, unemployment robustly correlated with economic activities. However, the statistical predictive relationship was significant in the hypotheses test; thus, the theory, empirical results, and qualitative evidence reinforce each other.

Question 4*: Can government intervention's absence increase economic activity?*

The participants' responses were as follows:

R1: Although market solutions often generate efficient outcomes, in severe shocks such as this pandemic, contemplating not doing anything will be disastrous. One option not to consider is the absence of government intervention. We are in a different era from the classical economists.

R2: It is not an option to consider. You know what John Maynard Keynes said: we are all dead in the long run.

R3: In this situation, the government's intervention with monetary and fiscal policy is inevitable. If a government fails to correct market failure, we have government failure on our hands. No government or citizens would want that. Indeed, doing nothing will not lead to an increase in economic activities.

R4: No responsible parent can sit unperturbed to watch their child cry for help without doing anything. Responsible governments are like that. Indeed, this is not an option; a lack of policy intervention will get nothing done.

R5: No, the government's silence will cause the economy to degenerate into a depression. It could reverse centuries of economic progress and retards productivity.

These responses qualitatively evaluated the overall Keynesian model. No view was deferred from the theoretical conceptualization of stimulus and the empirical evidence. Keynes (1937), Stilwell and Primrose (2010), and Baker et al. (2020) demonstrated that recession creates recessionary gaps in the short run; hence, the primary reaction to shocks is to use policy interventions to stabilize the economy. Krugman and Wells (2017) explained that expansionary fiscal policy shifts the AD curve rightward to cover the recessionary gap faster than the monetary policy to restore the economy to its full potential. Their views validated that Keynes's intervention policy provides a quick growth stimulant for a depressed economy. The participants' views validated the data analysis and theoretical results. The MR results of the Keynesian model found statistically significant evidence. They predicted the percentage change in real GDP significantly ($F(3,27) = 1.14$, $p < .05$). The qualitative and quantitative evidence suggests that fiscal intervention produced a significant change in economic activities, validating the usefulness of policy interventions. For example, the SBA-backed PPP loans helped small businesses manage their payrolls, preserve jobs, and contribute to GDP growth.

Question 5: *What is your overall assessment of the government's use of fiscal intervention to address the COVID-19 shock?*

The participants' responses were as follows:

R1: Fiscal interventions were necessary, but the government hesitated slightly, causing significant policy lag.

R2: Fiscal intervention was remarkably effective in supporting small businesses. The problem is the politicization, particularly the divides in Congress on political and ideological lines. However, apart from the legislative appropriation process, handling the intervention, including economic and public policy measures, was decently effective.

R3: I support policy interventions, but how and when the policies were implemented was worrisome. I am not critical of government intervention; such policies' effectiveness lies in boosting consumer spending among the most vulnerable and promoting private sector investment. However, the interventions should target the most vulnerable. The stimulus should be directed to households and small businesses who desperately need the money and are willing to spend it, not families and big companies that do not need it. Recall that each round of stimulus has a price tag, which the taxpayers will pay later.

R4: The government took appropriate policy action, but the spending came late, and the rounds were unsustainable. The first round came in March 2020, and it took about nine months for the second one. So, the delay created a lag in policy outcome.

R5: Economists have a disdain for government intervention. You should agree that those guys in the Congressional Budget Office (CBO) and Council of Economic Advisers (CEA) certainly know their jobs, but the only impediment was political.

The overall assessment of the participants is that government intervention was necessary, but some participants deferred on the timing and methods of the policy implementation. All the participants' views were consistent with Keynes's view that it is difficult for the market to correct itself in the long run without intervention. During persistent aggregate demand contraction, the

economy would reach a new equilibrium with slow growth, a high UR, and a recessionary gap (Keynes, 1937). However, all the participants admitted a need for fiscal intervention but expressed concern that misdirected fiscal intervention could produce counterproductive outcomes. The unsettled argument remains on what constitutes optimal stimulus and how it can generate optimal results if the impact of the pandemic differs across households and small businesses. Susskind and Vines (2020), Elgin, Basbug and Yalaman (2020), and Savalanli (2021) explained that the impact of COVID-19 differs across households due to some factors such as household income, dependency, and chronic illnesses that require a substantial part of the families' resources to manage. It is imperative to consider these factors before choosing a policy approach. Therefore, a targeted intervention is likely to generate a better policy outcome.

The Monetarist Model

In this study, the participants were asked five questions in the monetarist model to obtain their expert opinions about using monetary expansion to manage the COVID-19 shock. As Wilson (2014) noted, the essence of the interview is to use the participants' responses to help gauge the consistency of the theory and data results. The interview responses from the participants will be used to determine whether the monetary policy approach to managing the shock aligns with the empirical results. Accordingly, this study asked the participants five questions to obtain an objective policy assessment of the monetary policy measures used to respond to the economic impact of the COVID-19 pandemic. The questions were as follows:

Question 1: *To what extent do you think the interest rate (INT) reduction raises the GDP growth rate?*

The participants' responses were as follows:

R1: I think the Fed's lowering of the federal funds rate between 0% to 0.25% helped sustain credit flow to curb the pandemic's impact.

R2: It helped small businesses to access credit and helped the labor market rebound.

R3: Monetary policy intervention was critical in the recovery effort to a great extent, using quantitative easing (QE) to support the functioning of the financial market.

R4: It helped the labor market tremendously and helped to reduce job loss.

R5: It helped small businesses, particularly rural farmers with limited access to credit, secure loans at lower rates. The reduction of interest rates helped most farmers to keep their farms.

All the participants expressed similar views that reducing the interest rates helped limit job losses and enabled small businesses to access credit to sustain or expand their operations. These views are consistent with the monetary expansion theory and align with the results of the data analyses. For instance, Bordo and Rockoff (2013) found that reducing interest rates is more effective in stimulating private-sector spending. Furthermore, the independent-sample test in the monetarist model in Table 4 on page 65 indicates that INT has a standardized coefficient of -.533 that correlated with Per△GPD moderately.

Question 2: *Do you think the falling unemployment rate (UR) leads to GDP growth?*

The participants' responses were as follows:

R1: Yes, the falling unemployment rate contributes significantly to GDP growth. You can see from the Small Business Administration (SBA) PPP loan that many small businesses were able to keep their workers.

R2: During shocks, any economic policy aims to create jobs and prevent income loss from unemployment.

R3: The essence of the Fed's relaxing regulatory requirements, promoting direct lending, and supporting loans to small and medium-sized businesses is to reduce the unemployment rate because it is negatively and directly related to the GDP growth rate.

R4: The mantra during the recession is jobs and more jobs. Creating new jobs and protecting the existing ones reduces the unemployment rate and increases productivity.

R5: Yes, reducing unemployment increases consumers' liquidity and causes a significant shift in aggregate demand. You know, aggregate demand can be used to estimate national output.

All the participants agreed that the falling UR resulting from monetary expansion contributes to GDP growth. Guerrieri et al. (2020) found that the COVID-19 shock represents the labor market conditions. It implies that falling unemployment restores national output to its full potential. This view is consistent with empirical results. The MR results show that the UR strongly correlates negatively with the Per△GPD. The participants' responses reinforce the theoretical framework and empirical findings. Policymakers expect intervention programs to reduce the UR, implying that a reduction in unemployment must increase the GDP.

Question 3: *Do you think changes in the inflation rate (IFL) could be associated with the change in GDP growth?*

The participants' responses were as follows:

R1: One of the goals of monetary expansion during shocks is to raise the inflation rate in the short term. Inflation can rise till the labor market attains full or maximum employment.

R2: Changes in the inflation rates are consistent with the monetary policy's desire to keep liquidity flowing during this pandemic. That is not a problem during shocks because the Fed targets it.

R3: Of course, inflation and the unemployment rate have trade-offs. If you want to achieve growth in GDP and a substantial decrease in the unemployment rate, you must stop worrying about the inflation rate.

R4: No, in a situation like the COVID-19 pandemic, the focus should be on economic growth, not inflation.

R5: Yes, a temporary rise in inflation is critical in sustaining aggregate demand and consumers' confidence.

Four participants agreed that the IFL is associated with changes in GDP growth, whereas one participant differed. However, Alpanda (2019) and McLeay and Tenreyo (2020) found that the Phillips curve describes the trade-off between monetary policy utilization and inflation. The qualitative evidence was consistent with the empirical findings. The regression results demonstrate that inflation has a negative and weak correlation with Per△GPD, implying that variation in the INT and money supply has an insignificant impact on GDP during economic shock.

Question 4*: *To what extent do you think the absence of monetary policy intervention could lead to increased economic activities?

The participants' responses were as follows:

R1: As I said earlier, it will have no positive effect except if an alternative or fiscal policy is used.

R2: It will worsen the economic conditions and slow down growth.

R3: As much as the government has its preferred policy choice, a no policy cannot proffer any solution. It is challenging for the market to adjust itself, as Keynes said during the Great Depression.

R4: A sick person needs medicine to survive during illness. A sick person that fails to seek treatment may die. The shock could be protracted if monetary policy is not applied.

R5: It is not a choice for the government in the U.S.

All participants disagreed that the absence of monetary policy intervention could lead to increased economic activities, implying that reliance on the free money market and automatic stabilizers will not address the shock. If doing nothing is an option, the debate of what constitutes an optimal policy would not arise among policymakers. Fornaro and Wolf (2020) raised the policy question of what constitutes the optimal economic policy. However, the evidence obtained from the interview supports the theoretical framework. It is a standard monetary practice to close the recessionary gap by increasing the money supply.

Question 5: *What is your overall assessment of the government's use of monetary policy measures to address the COVID-19 shock?*

R1: Keeping money cheap would be the post-pandemic inflation effect. In the short run, the optimal inflation rate is suitable for economic growth but is a hydra-headed monster to tame in the long run. I think the Fed has done well, but it must continue to target the optimal inflation rate.

R2: Reopening the service-based small businesses was critical to the national economy. The Fed helped stabilize the short-term funding markets, keeping the economy running again. The only downside of monetary expansion is that many small businesses could still not access the funds, particularly in rural areas.

R3: The monetary policy measure did not cost the taxpayers anything; it did not result in a fiscal deficit, unlike the fiscal policy. The Fed was excellent in safeguarding the market functioning with the open market operation (OMO). Additionally, the Fed took supervisory and regulatory actions to encourage banks to dip into their capital and liquidity buffers to extend credit to borrowers affected by COVID-19. It provided relief to many low-income households.

R4: Monetary policy was necessary for revitalizing the private sector. The only concern I have about monetary policy is that it does not directly impact poor households.

R5: I am satisfied with the robustness of the monetary policy approach, particularly the agricultural credit extended to the farmers through the USDA Assistant Program.

All participants expressed substantial satisfaction with the Fed's handling of the monetary policy measures. They admitted that the Fed could use monetary expansion to keep a steady flow of liquidity. A particular participant expressed concern that monetary policy does not directly impact low-income families. All the participants admitted there was a trade-off between monetary policy and inflation. They implied that inflation during economic shocks does not harm economic growth in the short run. However, Alpanda (2019) and McLeay and Tenreyo (2020) admitted this view in their description of the Phillips curve as the trade-off between monetary policy utilization and inflation. For instance, Watson (2007) and Coibion and Gorodnickenko (2015) found that the Phillips curve had maintained a flatter trend, implying that inflation has become increasingly insensitive to standard measures of monetary policy utilization, such as unemployment. The participants' views were consistent with the monetarist's theory; however, the reality is that since the last quarter of 2021, the IFL has consistently maintained an upward trajectory.

CHAPTER FIVE: CONCLUSIONS

Overview

The Keynesian and monetarist theories aim to stimulate economic activities during severe shocks such as COVID-19 despite their different methods. The Keynesian model depends on the multipliers from fiscal spending to boost consumers' demand and cause a rise in aggregate demand. In contrast, the monetarist model relies on the changes in monetary variables, including INT, reserve requirements, and money supply, to provide liquidity to induce investment spending and employment. Thus, both models support the interventionist policy to manage the COVID-19 shock. The analysis of the research questions and the hypotheses tests provided empirical evidence to evaluate the efficacy of each model.

Furthermore, the expert views obtained through the interviews with the participants served as the qualitative measure to validate the theoretical and empirical evidence. In the Keynesian model, empirical evidence suggests that DPI, PCE, and UR jointly and significantly predicted the percentage change in GDP. Unfortunately, INT, IFL, and UR did not jointly and significantly predict the percentage change in GDP. However, a strong correlation was found between the UR and the percentage change in GDP and between inflation and the percentage change in GDP. The details of the empirical findings are analyzed extensively in the discussion.

Discussion

This research aims to examine the direct stimulus payments under the Keynesian model and the variations in the INT and money supply in the monetarist models to determine their efficacy in stimulating economic activities during the COVID-19 pandemic. The study evaluated the outcome of the policy interventions to manage the COVID-19 shock under the two models. The study modified the basic empirical equations and augmented them to assess the empirical

statements under the two models to identify causal relationships between the dependent and explanatory variables. The study modified the basic regression model in Eq. 11 into the empirical models in Eq. 12 and Eq. 13 to predict the percentage change in GDP following the method in Creswell (2013) and Baker et al. (2020). The study uses the empirical evidence obtained from the linear multiple regression results to test the hypotheses as an imperative to evaluate the research questions in each model.

The Keynesian Model

RQ1: *How much, if any, does the change in disposable personal income (DPI) from direct government transfer payments raise the GDP?*

The null hypotheses provide a practical solution to the research questions in the Keynesian model. The null hypothesis for **RQ1** suggests no statistically significant relationship between DPI and the percentage change in GDP (Per△GPD), implying that a change in disposable income from direct stimulus does not significantly raise the GDP. This finding was consistent with results from Chetty et al. (2020) and O'Reilly and Perret (2020). Baker et al. (2020) admitted that an increase in DPI from transfers diverts income to forced savings. O'Reilly and Perret (2020) found that fiscal measures could stimulate demand; however, their implementation incentivizes behavior inconsistent with the desired public health goals. The expert opinion in the qualitative assessment validates this finding. However, the efficacy of transfer payments relies on the households' MPCs that influence consumer behavior (Baker et al., 2020; Baqaee & Farhi, 2021).

RQ2**:** *To what extent does the increase in personal consumption expenditure (PCE) correlate with the changes in economic activities?*

The null hypotheses test for **RQ2** was insignificant. The study did not find any statistically significant predictive relationship between PCE and the percentage change in GDP. This finding

contradicts the evidence reported by Barker et al. (2020) and Chetty et al. (2020); however, the linear MR result indicates a weak positive correlation between changes in PCE and GDP. This result contradicts Keynes's (1936) assumption that consumption spending translates into increased economic activities. Cheng (2015), Barker et al. (2020), Chetty et al. (2020), and Baqaee and Farhi (2021) ascertained that multiplier of consumption spending (M) would induce a higher velocity (V) of money, which pushes the economy on a faster recovery path in the short run. However, if the rounds of transfers are not enough, achieving the desired multiplier from consumption spending would not be easy. The finding in this study reveals new evidence that an inadequate consumption multiplier cannot induce a higher velocity of money.

RQ3: *To what extent do the change in the UR due to COVID-19 correlate with economic activities?*

The null hypothesis test for **RQ3** under the Keynesian model failed and was rejected; hence the alternative hypothesis was accepted. The null hypothesis evaluated the correlation between the UR and the change in GDP. The empirical evidence demonstrates a statistically significant correlation between the UR and Per△GPD, indicating that a 0.56% decrease in unemployment leads to a 1% increase in the GDP holding other variables constant. This result is consistent with those found in Eggerston (2005), Barker et al. (2020), Chetty et al. (2020), and Baqaee and Farhi (2021). Furthermore, the finding concerning the Keynesian model is consistent with Keynes's (1936) idea that stimulus is necessary to induce economic activities, restore consumers' confidence, and close the output gap to bring employment to its full potential. The qualitative evidence overwhelmingly validates this evidence.

RQ4: *To what extent does the absence of government intervention lead to increased economic activity?*

The null hypotheses test the overall significance of the Keynesian model. The empirical evidence indicates a causal relationship that jointly and significantly predicts the percentage change in real GDP. The null hypothesis was rejected because DPI, PCE, and UR jointly and significantly predicted the percentage change in GDP. The empirical evidence suggests that an 11.30% variation in real GPD is attributed to the changes in DPI, PCE, and UR. The result is consistent with findings from Stilwell and Primrose (2010) and Baker et al. (2020), which showed that recession creates recessionary gaps in the short run, suggesting pragmatic reactions to shocks. Keynes (1937) recommended using policy interventions to stabilize the economy. The qualitative evidence validates both the theoretical and empirical findings. A more structured equation could help to understand how factors relate to each other.

The Monetarist Model

RQ1: *To what extent does the interest rate (INT) reduction induce growth in the GDP?*

Some of the evidence in the monetarist model was consistent with the traditional monetarist theory. Unfortunately, the findings for the hypothesis for **RQ1** were not significant, implying that INT is not a good predictor of the percentage change in GDP. This evidence contradicts the conclusion of Bordo and Rockoff (2013) and the central theme of Freidman's (1982) monetary expansion. The monetarists expect that INT will display a weak response to inflation without imposing restrictions on the impact of monetary expansion on the output gap. Castelnuovo and Surico (2010) observed that the New-Keynesian models impose restrictions within the monetary policy that have a non-negative effect on INT. This study did not restrict economic expansion as Castelnuovo and Surico (2010) did because of the severe nature of the investigated policy issue. Imposing a contemporaneous zero restriction amplifies the inflation impact and makes it optimistic (Castelnuovo & Surico, 2010). Gwartney et al. (2018) explained that the central tenet of monetary

expansion is that an increase in money supply will cause a proportionate increase in the price level (p. 285), implying that varying INT and money supply does not significantly raise the GDP during the pandemic. This finding is inconsistent with the monetary expansion theory and the qualitative evidence from the participants' interviews because the current inflation trend defies the traditional monetary theory.

RQ2**:** *To what extent does the UR correlate with the change in GDP?*

There is a strong negative correlation between the UR and percentage change in GDP, but the monetarists model has a p-value > 0.05; thus, the hypotheses test for RQ2 fails. The result of the monetarists model indicates that a 1.22% decrease in unemployment leads to a 1% increase in the GDP holding other variables constant. This implies that a significant decline in unemployment under the monetarists model is needed to realize the equivalent change in GDP in the Keynesian model. The beta coefficient of 0.71 suggests a strong correlation between the UR and the percentage change in GDP. The result of the data analysis was consistent with the original fiscal theory of Keynes (1937) and recent studies, including Seidman and Lewis (2015), Guerrieri et al. (2020), and Fornaro and Wolf (2020). The qualitative evidence validates the theoretical and empirical evidence that the decreasing UR resulting from monetary expansion contributes to GDP growth. However, a significant decrease in unemployment in the monetarist model is required compared with the Keynesian model. For instance, Guerrieri et al. (2020) reported evidence that the COVID-19 shock represents the labor market conditions, implying that decreasing unemployment helps stabilize the national output to its full potential. Additionally, the results of the linear MR indicate that the UR has a strong negative correlation with the Per△GPD. A general expectation among monetarists and Keynesians alike is that low unemployment leads to a greater GDP. The qualitative evidence validates both the theoretical framework and empirical findings.

RQ3**:** *To what extent does the IFL correlate with the change in GDP?*

The results indicate no statistically significant relationship between the IFL and the percentage change in GDP, meaning that variation in the IFL and money supply has an insignificant impact on GDP during the pandemic. The qualitative evidence differed from empirical findings and aligned with the theory that the IFL is associated with changes in GDP growth. The empirical results contradict the conclusions of Alpanda (2019) and McLeay and Tenreyo (2020), which analyzed the behavior of the Phillips curve and described it as a trade-off between monetary policy utilization and inflation. Guerrieri et al. (2020) modified the Phillips curve to demonstrate that if the increase in money supply causes the IFL to rise, then monetary policy is optimal in the short term. Hence, the optimal monetary policy optimizes the Fed's IFL, output gap, and federal lending rate at various stages of the shock. Thus, the shock moves the IFL and output gap in the opposite directions, reinforcing the trade-off that faces the Fed, indicating that the optimal IFL, output gap, and federal funds rate jointly are the function of the shock (mt*)*. It modifies the Taylor rule in Eq. 9 and shows that the optimal IFL will rise. This finding addresses the argument of Baker et al. (2020) and Baqaee and Farhi (2021) that the Phillips curve would generate a smaller rise in inflation and more loss in output. However, the empirical and qualitative evidence in this study is consistent with the results of Guerrieri et al. (2020). They found that inflation was less responsive to changes in INT when the slope of the Phillips curve was low, making the monetary policy less effective (Guerrieri et al., 2020).

RQ4*: To what extent does the absence of government intervention lead to increased economic activities?*

This research question tested the strength of the monetarist model against the free market approach. The null hypothesis tested the causal effect of the explanatory variables on the real GDP

to ascertain its efficacy in managing the impact of the pandemic. The overall MR model was not statistically significant and could not significantly predict the percentage change in real GDP, implying that all the variables, including INT, UR, and IFL, jointly, could not predict the percentage change in GDP. The empirical evidence suggests that the monetary policy alone is ineffective in managing severe shocks such as COVID-19. The hypothesis test addresses the fundamental research question about monetary expansion and confirms that varying interest rates and money supply during severe shocks do not significantly impact economic activities or alleviate hardship. This empirical finding tends to uncover fresh evidence that suggests that leakages and policy lag could render monetary policy ineffective as intended. For example, suppose mainstream monetarists such as Milton Freidman (1968) and Fiebiger and Lavoie (2018) were confident that reducing interest rates to increase the money supply makes borrowing attractive and stimulates consumption and investment spending. In that case, contrary evidence opens a new debate in the policy arena.

However, a do-nothing approach will not protect the economy from such severe shocks. In this regard, all participants agreed that the absence of monetary policy intervention could not lead to any significant increase in economic activities. The qualitative evidence reinforces the theoretical and empirical conception of economic policy. White (2012) argued that the idea of using monetary policy is to "restate theoretically, apply empirically and enunciate the policy implications of the quantity theory of money" (p. 320). As detailed in Casado et al. (2020) and Fornaro and Wolf (2020), the COVID-19 stimulus payment displayed a critical and significant effect on spending and economic activity. The findings in this study have policy implications and address the research questions, suggesting that the Keynesian stimulus theory is still practical if applied appropriately.

Implications

The empirical test reinforced the theoretical foundation of the Keynesian stimulus theory that direct cash payment and support for small businesses directly impacted by the COVID-19 shock can stimulate economic activities. The empirical evidence provides insight into the rationale of the CARES Act, highlighting the politics of economic stimulus and the cost benefits of its implementation. The pandemic impacts AD, and the expected future growth may not be affected and may not preclude the shock's adverse outcomes. Fornaro and Wolf argued that drastic policy intervention, including monetary and fiscal intervention, might be needed to forestall the negative supply shock from severely affecting employment and productivity (Fornaro & Wolf, 2020). Baker et al. (2020) noted that "the more cash arrives with agents that have high MPCs, the higher the fiscal multipliers" (p. 23). The empirical results and evidence reported by Fornaro and Wolf (2020) and Baker et al. (2020) suggest that direct government transfer payments significantly raise DPI and increase PCE, which correlates with increased economic activities, including a decrease in the UR. The findings in this study challenge the orthodoxy of DPI's positive correlation with the change in GDP.

The efficacy of the Keynesian stimulus depends on several factors that have to do with the size, scope, and frequency of the payment in the pandemic period. It raises concern and questions the rationale for the resistance of some policymakers who think that policy comes at an exceedingly high cost. Casado et al. (2020), Baker et al. (2020), and Weible et al. (2020) raised the question of leadership in policy decisions because choices impose different social and economic costs and benefits, which generates heightened public attention and policy impacts. Considering the relevant economic indices, whether the CARES Act was used for politicking rather than an economic panacea to avoid a recession, the policy concern should be whether the

stimulus payment produced the desired outcome and long-term implications. The strong negative relationship between the coefficients of change in real GDP and the DPI demonstrates that DPI from direct cash transfer diverts to forced savings. This evidence suggests that policymakers should reevaluate the application of fiscal measures and target them appropriately. The evidence in Casado et al. (2020), Baker et al. (2020), and Chetty et al. (2020) suggest that transfers are more effective if they are used to replace the lost income of disengaged workers and help small businesses better manage their payroll cost to stop further job losses. This implies that policymakers should target stimulus transfers at households that need it to produce the desired multiplier effect. Wrongly targeting transfers would turn Keynes's idea of economic stimulus during recessions on its head and becomes counterproductive to the predictable Keynesian result. Poor fiscal and monetary policy timing often produces outcomes more diminutive than the Ricardian equivalence. The interest and rent-seeking propensities of the policymakers should not superimpose the stimulus policy's goals.

Ultimately, the findings imply that the Keynesian theory is practical as part of the intervention approach, and the economic consequences of the COVID-19 pandemic are unavoidable without an objective interventionist policy. Policymakers can use this research's findings to evaluate the outcome of earlier stimulus policies to improve the policy effectiveness if the shock lingers longer. Another critical implication is that policymakers can use this study's findings to target unemployment benefits and reconsider the BLS definition of unemployment, emphasizing an individual's willingness to actively seek employment for the stimulus policy's purpose. The correlation coefficients in both Keynesian and monetarist models indicate that unemployment strongly predicts increased economic activity. The general notion of public policy hinges on Fischer's reconceptualization of Dye's (1984) idea that public policy is "whatever

governments choose to do or not to do" (p. 2). The dire situation of COVID-19 requires interventionist actions involving making the adjustment process reliant on the timing and inherent choices associated with reactionary policy decisions that focus on reducing the UR.

In severe shocks such as the COVID-19 pandemic, using each policy approach in isolation from the other tends to undermine the goal of stabilizing the economy faster. Keynes's (1936) conceptualization is that stimulus relies on fiscal authorities, whereas Friedman (1968, 1982) posited that monetary expansion depends on variations in interest rates, money supply, and debt management. The Keynesians have continued to follow Keynes's (1936, 1937) tradition that liquidity unleashes the animal spirit, which has remained the Keynesian theory's conceptual foundation. Conversely, Freidman reinforced Hayek's free-market principle that lowering the interest rates to increase money supply will increase liquidity (Freidman, 1982). These claims and counterclaims run deep into the policy choice to manage shocks. For instance, Bordo and Rockoff (2013) found that lowering interest rates boosts private-sector demand. Thus, the monetarists argued that fiscal measures could not provide the desired panacea for the COVID-19 shock. In another study, Fornaro and Wolf (2020) found a counter result: the monetarist model alone could not sustain demand and generate multipliers that reverse the supply-demand loop. Many studies have produced different results.

However, earlier results in Bernanke et al. (2005) provided a middle ground to combine the Keynesian and monetarist models to achieve the goal of economic policy. Bernanke et al. (2005) found that changing nominal interest variables combined with fiscal measures increases higher demand for liquidity. This stimulates investment spending, sustains consumers' expectations for future income, and boosts consumer confidence. The significant implication of the results in this study is that the Keynesian and monetarist models reinforce each other. Keynes

and Friedman may have said the same thing but in different economic languages. When investigated in isolation, the monetarist model was marginally insignificant at the p-value of 0.06. If the effects of the variables in both models are measured jointly, the variables may become better predictors of change in real GDP.

Limitations

The major limitation encountered in this research is the high level of data disaggregation on the impact of COVID-19 on different jurisdictions, including states, counties, metropolitan statistical areas (MSA), and regions. Each of these jurisdictions' economies differs, and the pandemic affected each differently. However, BEA estimated their data for COVID-19 and the impact from estimates of payment card transactions of daily spending by industry. The study used aggregated national data of the relevant variables to predict GDP in each model. Due to the pandemic's ongoing nature, new data emerge that most researchers calibrate data, construct the indexes, or use proxies to impose constraints that fit their models. This study addressed critical policy issues and relied on actual data of the variables at the aggregated form at the national level, such as DPI, PCE, UR, IFL, and INT. However, measuring a phenomenon requires collecting the correct data from the appropriate source (Creswell, 2013; Meier, Brudney, & Bohte, 2015).

The delays in releasing the official data remain a substantial limitation on any empirical research. For instance, BEA released the official GDP data for the first quarter of 2022 in May 2022. There is a possibility that a new set of data can change the outcome of an empirical test or result. If the study had added more data, the sample size (N) would have been five times greater than N (31) used in both models. As noted in the literature, including Creswell (2014) and Meier et al. (2015), the central limit theory stipulates that a normal or approximately normal distribution has a sample more significant than 30.

Another major constraint is the difficulty of tracking the participants for interviews to obtain their opinions on the investigated issues. The constraint on traveling to get their responses were worth the time and resources committed to it because face-to-face interviews allowed for visually observing the facial expressions and mannerisms of the participants during the interviews. The problem of self-bias is common in qualitative research due to personal and ideological factors; hence, the questions were crafted objectively to minimize the influences of personal biases. Still, some respondents did not respond directly to the questions because they wanted to express their opinions freely. Creswell (2014) and Nakamura and Steinsson (2018) advised that researchers should use a straightforward design of questionnaires to align the interview questions to the main research questions. Despite these constraints, the research followed a standard empirical process in collecting the data, encoding them, entering them into the computer system, and following the appropriate practical steps in obtaining and analyzing the outputs.

Recommendations for Future Research

Further work must illuminate gray areas and provide insight into how best to appropriately design stimulus to target consumption and DPI with minimal behavioral effects. We are not yet out of the pandemic's shock; the economic impact is ongoing, and data constraints are still challenging to policy research because of the time lag associated with policy outcomes. Further research could uncover fresh evidence on whether unemployment benefits during the shock prolonged unemployment durations. As more data become available, research into a recovery plan that utilizes fiscal recovery rebates for about six months can generate and sustain the multipliers that drive DPI and PCE to restore the economy to its full potential. Future works that look at the indirect impact and the influence of uncertainties in individual and household decisions can help understudy the shock's microeconomic effects on individual and family behavior. These will

provide a broad perspective to mirror the efficacy of the Keynesian stimulus from a multidimensional spectrum.

Answers to the following research questions could contribute to furthering this study:

i. Does poor stimulus payment targeting undermine the outcome of the Keynesian stimulus policy?

ii. What is the appropriate size and scope of direct stimulus payment?

iii. Does the stimulus program prolong unemployment duration and discourage household savings?

iv. How can the Keynesian stimulus program be redesigned not to undermine intergenerational equity while dealing with the ramifications of a short-term shock?

The researcher welcomes opportunities to further this study to provide post-pandemic answers to these policy questions. Additionally, post-pandemic research will provide broader data to measure the full extent of the impacts of the COVID-19 pandemic under the Keynesian and monetarist models.

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APPENDIX

Table 5: Percent change from preceding month

Time	*Per⊿GPD*	*Per⊿DPI*	*Per⊿PCE*	*UR*
Jul-19	*0.93*	*0.3*	*0.5*	3.7
Aug-19	*0.93*	*0.6*	*0.1*	3.7
Sep-19	*0.93*	*0.4*	*0.2*	3.5
Oct-19	*0.63*	*0*	*0.2*	3.6
Nov-19	*0.63*	*0.4*	*0.4*	3.6
Dec-19	*0.63*	*0.2*	*0.3*	3.6
Jan-20	*-1.70*	*0.6*	*0.2*	3.5
Feb-20	-1.70	0.5	0	3.5
Mar-20	-1.70	-1.7	-6.7	4.4
Apr-20	-10.40	14.8	-12.9	14.8
May-20	-10.40	-4.8	8.5	13.3
Jun-20	-10.40	-1.3	5.6	11.1
Jul-20	11.27	0.8	1.5	10.2
Aug-20	11.27	-3.1	1.21	8.4
Sep-20	11.27	0.8	1.3	7.8
Oct-20	1.5	-0.7	0.2	6.9
Nov-20	1.5	-1.2	-0.6	6.7
Dec-20	1.5	0.6	-0.4	6.7
Jan-21	2.10	11.4	2.4	6.3
Feb-21	2.10	-8.1	-1.1	6.2
Mar-21	2.10	23.6	5.2	6.0
Apr-21	2.23	-15.3	1.1	6.1
May-21	2.23	-2.7	0.1	5.8
Jun-21	2.23	0	1.1	5.9
Jul-21	0.77	1.1	0.1	5.4
Aug-21	0.77	0.1	1	5.2
Sep-21	0.77	-1.3	0.6	4.7
Oct-21	2.30	0.5	1.4	4.6
Nov-21	2.30	0.4	0.5	4.2
Dec-21	2.30	0.3	-0.9	3.9
Jan-22	2.00	0.1	2.7	4.0

Source: BEA – GDP, DPI, and PCE Outlays July 2019 – Jan. 2022. FRED, and Coin News, USA.

Table 6: Percent change from the preceding month

Time	*Per△GPD*	*INT*	*IFL*	*UR*
Jul-19	*0.93*	2.40	1.8	3.7
Aug-19	*0.93*	2.13	1.7	3.7
Sep-19	*0.93*	2.04	1.7	3.5
Oct-19	*0.63*	1.83	1.8	3.6
Nov-19	*0.63*	1.55	2.1	3.6
Dec-19	*0.63*	1.55	2.3	3.6
Jan-20	*-1.7*	1.55	1.8	3.5
Feb-20	-1.70	1.58	1.5	3.5
Mar-20	-1.70	0.65	0.3	4.4
Apr-20	-10.40	0.05	0.1	14.8
May-20	-10.40	0.05	0.6	13.3
Jun-20	-10.40	0.08	1	11.1
Jul-20	11.27	0.09	1.3	10.2
Aug-20	11.27	0.10	1.4	8.4
Sep-20	11.27	0.09	1.2	7.8
Oct-20	1.5	0.09	1.2	6.9
Nov-20	1.5	0.09	1.4	6.7
Dec-20	1.5	0.09	1.2	6.7
Jan-21	2.10	0.09	1.4	6.3
Feb-21	2.10	0.08	1.7	6.2
Mar-21	2.10	0.07	2.6	6.0
Apr-21	2.23	0.07	4.2	6.1
May-21	2.23	0.06	5	5.8
Jun-21	2.23	0.08	5.4	5.9
Jul-21	0.77	0.10	5.4	5.4
Aug-21	0.77	0.09	5.3	5.2
Sep-21	0.77	0.08	5.4	4.7
Oct-21	2.30	0.08	6.2	4.6
Nov-21	2.30	0.08	6.8	4.2
Dec-21	2.30	0.08	7	3.9
Jan-22	2.00	0.08	4.7	4.0

Source: BEA – GDP, DPI, and PCE Outlays July 2019 – Jan. 2022. FRED, and Coin News, USA.

Table 7: Descriptive Statistics of the Keynesian Model

	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
PerΔGDP	31	-10.40	11.27	.9965	4.97909	24.791	-.355	.421
PerΔDPI	31	-15.30	23.60	.5581	6.45222	41.631	1.524	.421
PerΔPCE	31	-12.90	8.50	.4455	3.48077	12.116	-1.656	.421
UR	31	3.50	14.80	6.0419	2.89123	8.359	1.653	.421
Valid N	31							

Table 8: Correlations

		Per△GPD	Per△DPI	Per△PCE	UR
Pearson Correlation	Per△GPD	1.000	-.064	.050	-.327
	Per△DPI	-.064	1.000	-.016	.082
	Per△PCE	.051	-.016	1.000	.046
	UR	-.327	.082	.046	1.000
Sig. (1-tailed)	Per△GPD	.	.366	.393	.036
	Per△DPI	.366	.	.466	.330
	Per△PCE	.393	.466	.	.403
	UR	.036	.330	.403	.
N	Per△GPD	31	31	31	31
	Per△DPI	31	31	31	31
	Per△PCE	31	31	31	31
	UR	31	31	31	31

Table 9: Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	UR, Per△PCE, Per△DPI[b]	.	Enter

a. Dependent Variable: Per△GPD

b. All requested variables entered.

Table 10: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.336[a]	.113	.014	4.94410

a. Predictors: (Constant), URat, Per△PCE, Per△DPI
b. Dependent Variable: Per△GPD

Table 11: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	83.749	3	27.916	1.142	.0350[b]
	Residual	659.992	27	24.444		
	Total	743.741	30			

a. Dependent Variable: Per△GPD
b. Predictors: (Constant), URat, Per△PCE, Per△DPI

Table 12: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	4.356	2.088		2.086	.047	.071	8.640
	Per△DPI	-.029	.146	-.036	-.198	.844	-.329	.271
	Per△PCE	.104	.290	.065	.360	.722	-.490	.699
	UR	-.563	.314	-.327	-1.796	.084	-1.207	.080

a. Dependent Variable: Per△GPD

Table 12: Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-5.3267	2.3935	.9965	1.67082	31
Std. Predicted Value	-3.784	.836	.000	1.000	31
Standard Error of Predicted Value	.906	4.438	1.544	.892	31

Adjusted Predicted Value	-2.6987	15.7402	1.8879	2.95257	31
Residual	-9.12484	12.52667	.00000	4.69039	31
Std. Residual	-1.846	2.534	.000	.949	31
Stud. Residual	-2.329	2.676	-.060	1.103	31
Deleted Residual	-26.14021	13.96871	-.89140	7.34387	31
Stud. Deleted Residual	-2.557	3.063	-.051	1.209	31
Mahal. Distance	.039	23.210	2.903	5.366	31
Cook's Distance	.000	5.632	.247	1.024	31
Centered Leverage Value	.001	.774	.097	.179	31

a. Dependent Variable: Per△GPD

Table 13: Descriptive Statistics of the Monetarist Model

	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
PerΔGDP	31	-10.40	11.27	.9965	4.97909	24.791	-.355	.421
INT	31	.05	2.40	.5500	.78957	.623	1.266	.421
IFL	31	.10	7.00	2.7581	2.07055	4.287	.790	.421
UR	31	3.50	14.80	6.0419	2.89123	8.359	1.653	.421
Valid N	31							

Table 14: Descriptive Statistics

	Mean	Std. Deviation	N
PerchGDP	.9965	4.97909	31
INT	.5500	.78957	31
IFL	2.7581	2.07055	31
UR	6.0419	2.89123	31

Table 15: Correlations

		PerchGDP	INT	IFL	URat
Pearson Correlation	Per△GPD	1.000	-.090	.200	-.327
	INT	-.090	1.000	-.294	-.519
	IFL	.200	-.294	1.000	-.418
	UR	-.327	-.519	-.418	1.000
Sig. (1-tailed)	Per△GPD	.	.315	.141	.036
	INT	.315	.	.054	.001
	IFL	.141	.054	.	.010
	UR	.036	.001	.010	.
N	Per△GPD	31	31	31	31
	INT	31	31	31	31
	IFL	31	31	31	31
	UR	31	31	31	31

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	UR, IFL, INT[b]	.	Enter

a. Dependent Variable: PerchGDP
b. All requested variables entered.

Table 16: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.479[a]	.229	.144	4.60722

a. Predictors: (Constant), UR, IFL, INT
b. Dependent Variable: PerchGDP

Table 17: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	170.627	3	56.876	2.679	.067[b]
	Residual	573.114	27	21.226		
	Total	743.741	30			

a. Dependent Variable: PerchGDP
b. Predictors: (Constant), UR, IFL, INT

Table 18: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	11.918	4.987		2.390	.02	1.685	22.151
	INT	-3.361	1.655	-.533	-2.031	.05	-6.758	.035
	IFL	-.611	.594	-.254	-1.029	.313	-1.831	.608
	UR	-1.223	.476	-.710	-2.570	.016	-2.199	-.247

Table 19: Coefficients [a]

Model		Correlations			Collinearity Statistics	
		Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)					
	INT	-.090	-.364	-.343	.414	2.414
	IFL	.200	-.194	-.174	.467	2.139
	UR	-.327	-.443	-.434	.374	2.673

a. Dependent Variable: PerchGDP

Table 20: Collinearity Diagnostics [a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	INT	IFL	UR
1	1	2.847	1.000	.00	.01	.01	.01
	2	.751	1.947	.00	.30	.02	.01
	3	.385	2.719	.00	.00	.25	.07
	4	.018	12.679	1.00	.68	.72	.91

a. Dependent Variable: PerchGDP

Table 21: Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-6.4047	4.1705	.9965	2.38486	31
Std. Predicted Value	-3.103	1.331	.000	1.000	31
Standard Error of Predicted Value	1.075	2.941	1.608	.400	31
Adjusted Predicted Value	-3.6580	5.7677	1.1557	2.20703	31

Residual	-7.86758	12.91918	.00000	4.37079	31
Std. Residual	-1.708	2.804	.000	.949	31
Stud. Residual	-1.841	2.960	-.015	1.017	31
Deleted Residual	-9.14250	14.39349	-.15920	5.04843	31
Stud. Deleted Residual	-1.932	3.534	.014	1.118	31
Mahal. Distance	.665	11.254	2.903	2.192	31
Cook's Distance	.000	.250	.041	.073	31
Centered Leverage Value	.022	.375	.097	.073	31

a. Dependent Variable: PerchGDP

Figure 3: The Keynesian Model Normality Plot.

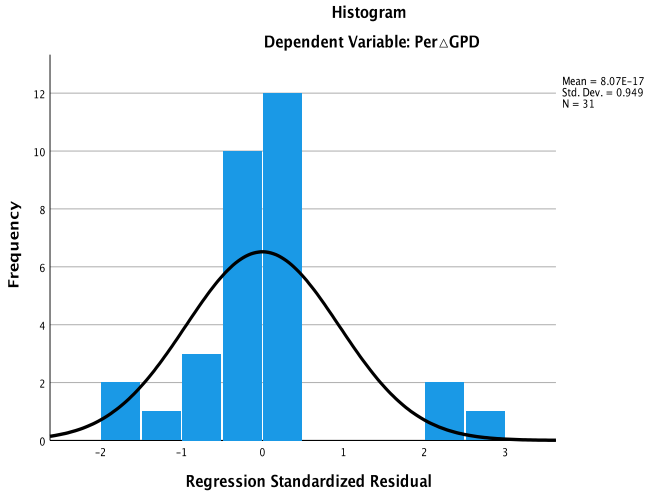

Figure 4: The Monetarist Model Normality Plot.

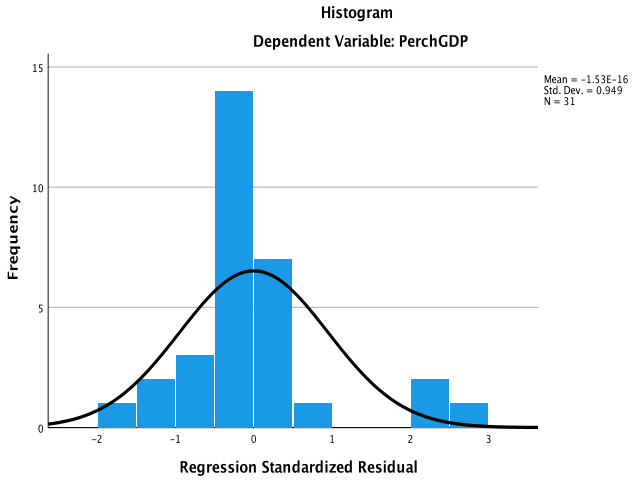

Figure 5: The Normal P-P Plot of Regression Residuals in the Keynesian Model

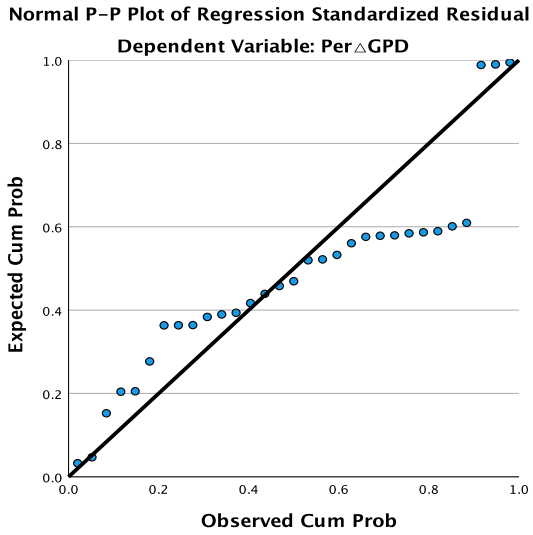

Figure 6: Scatter Plot of Dependent Variable and the Standardized predicted values in the Keynesian Model.

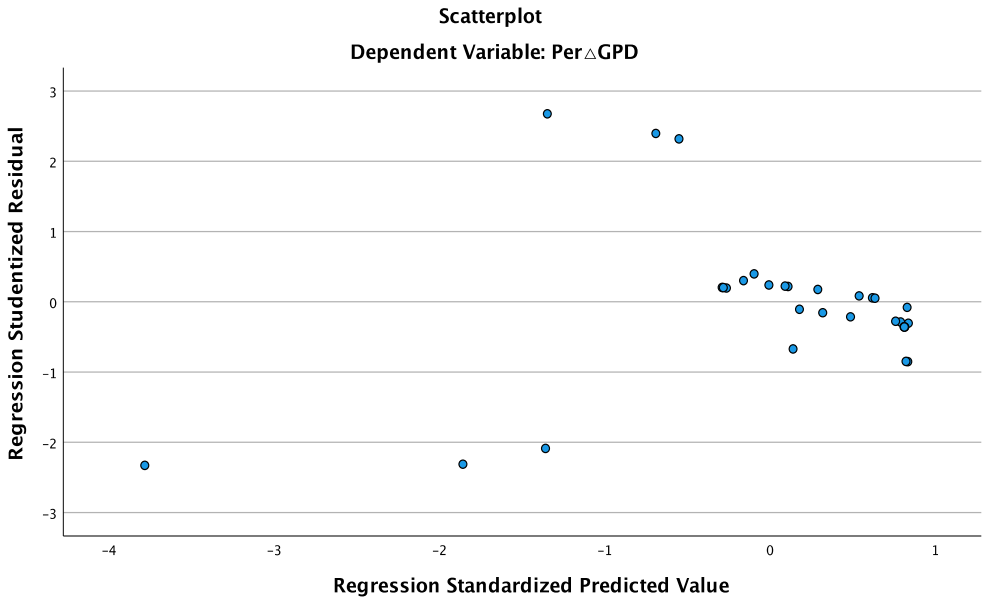

Figure 7: Partial Regression Plot of PerΔGDP and PerΔDPI.

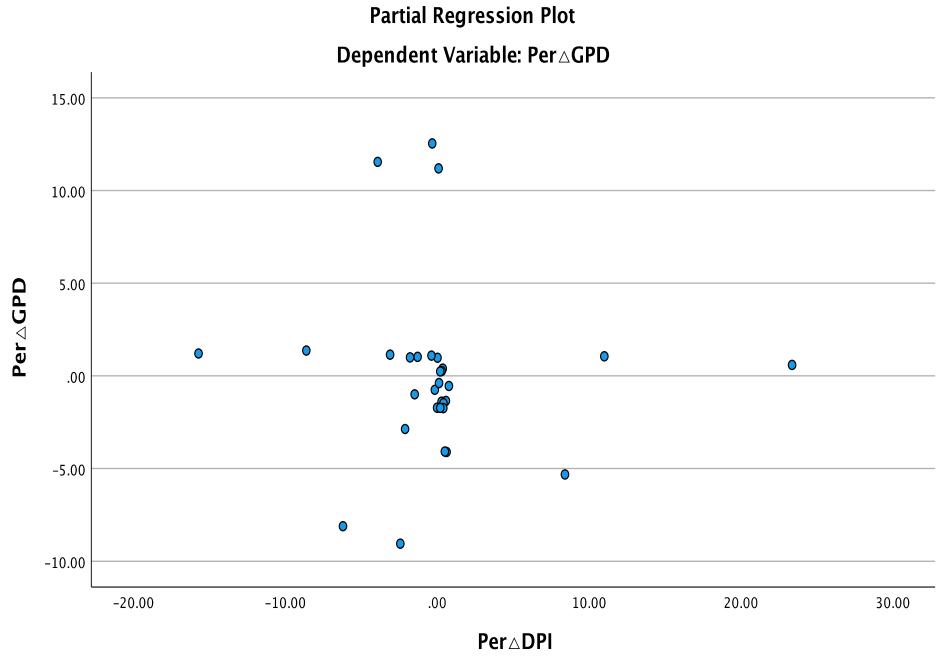

Figure 8: Partial Regression Plot of PerΔGDP and PerΔDPI.

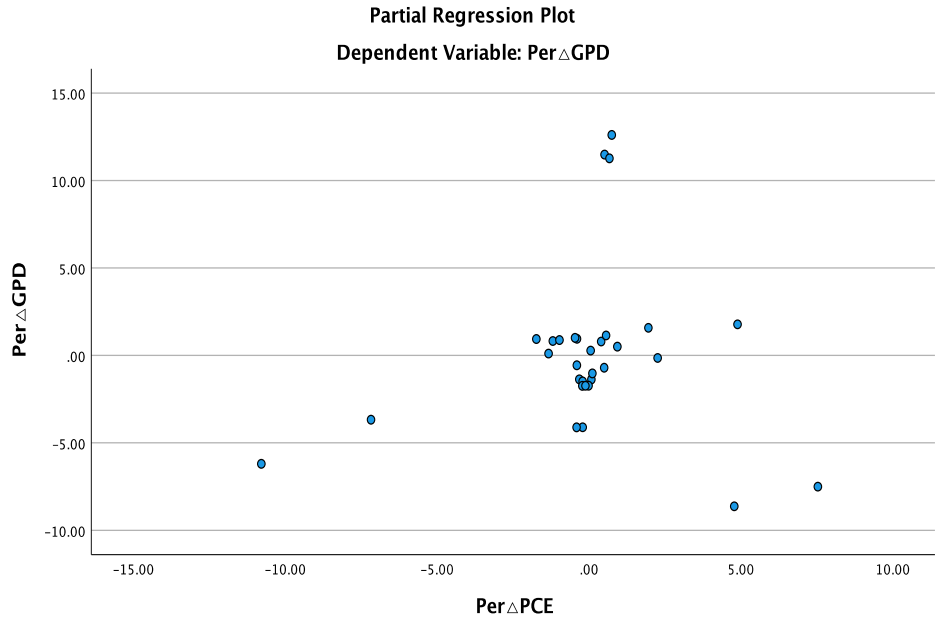

Figure 9: Partial Regression Plot of PerΔGDP and UR.

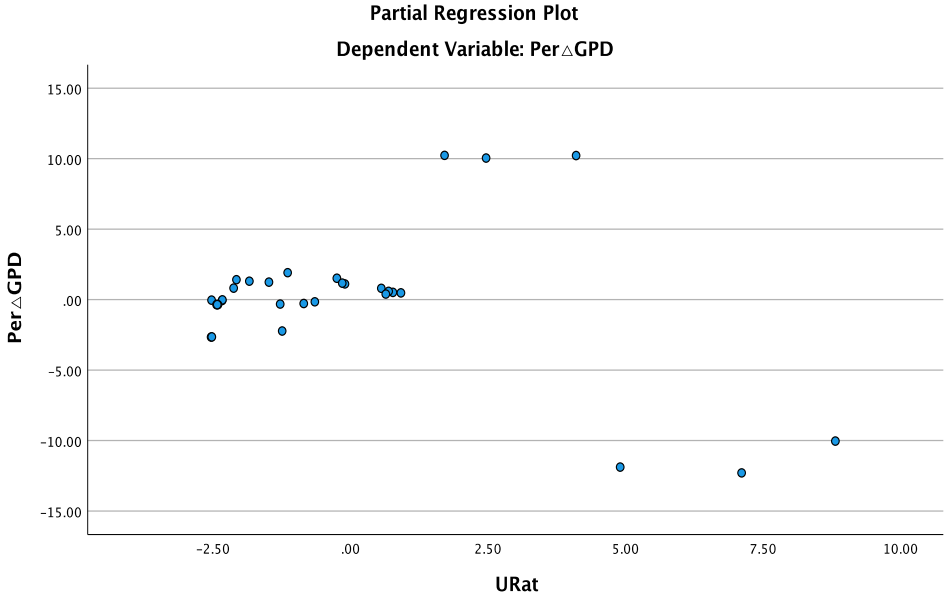

Figure 10: The Normal P-P Plot of Regression Residuals in the Monetarist Model

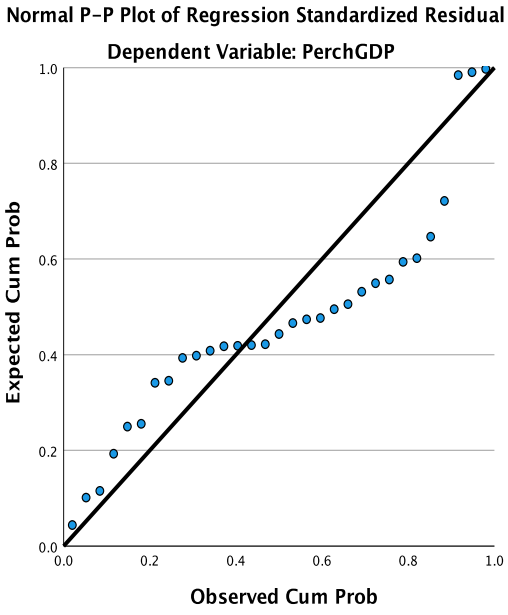

Figure 11: Scatter Plot of Dependent Variable and the Standardized predicted values in the Monetarist model.

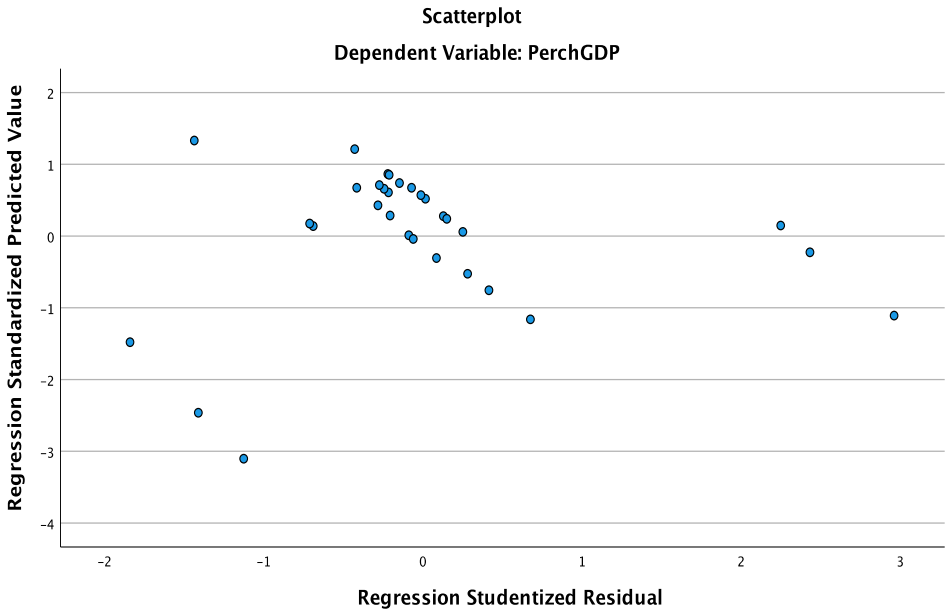

Figure 13: Partial Regression Plot of PerΔGDP and INT.

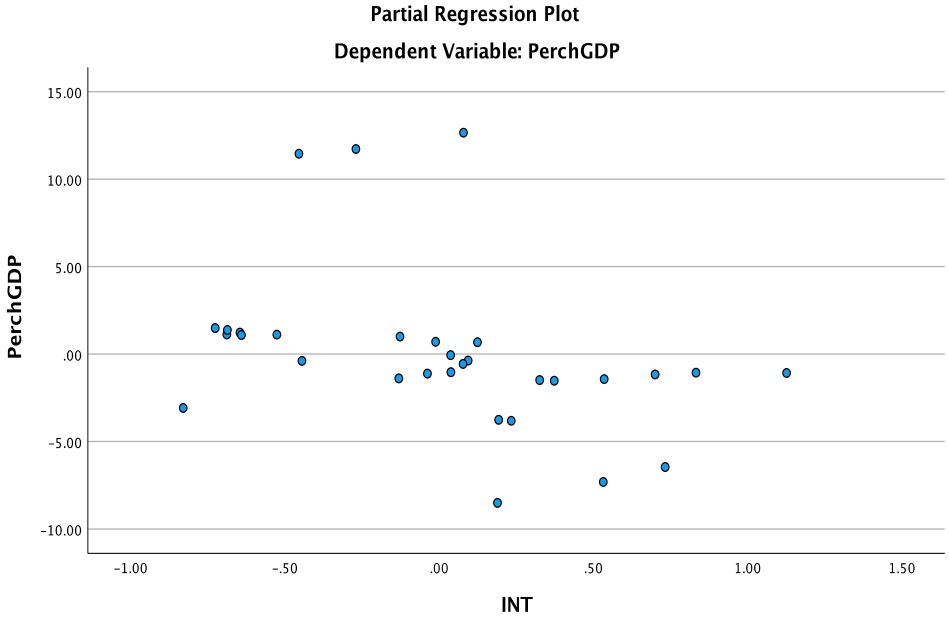

Figure 12: Partial Regression Plot of PerΔGDP and PerΔDPI.

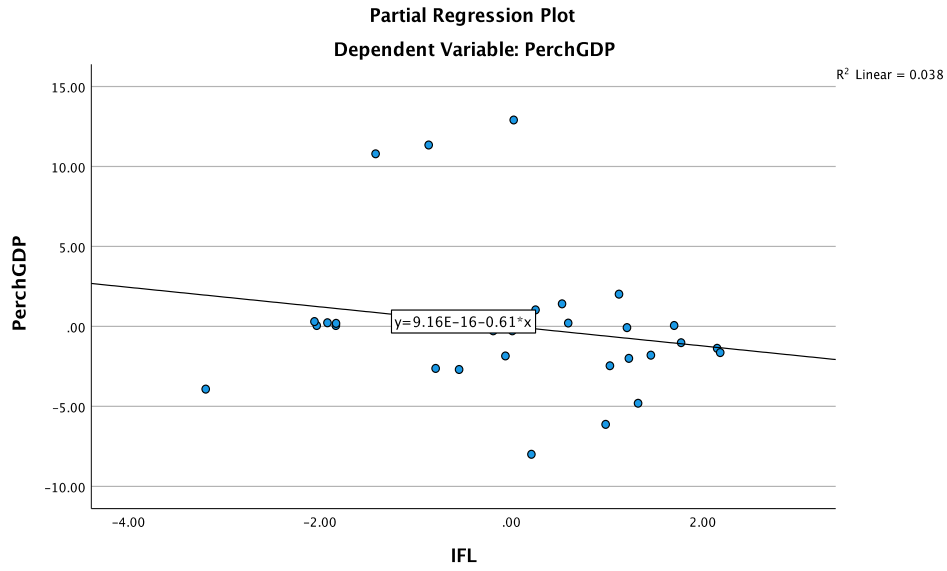

Figure 14: Partial Regression Plot of PerΔGDP and UR.

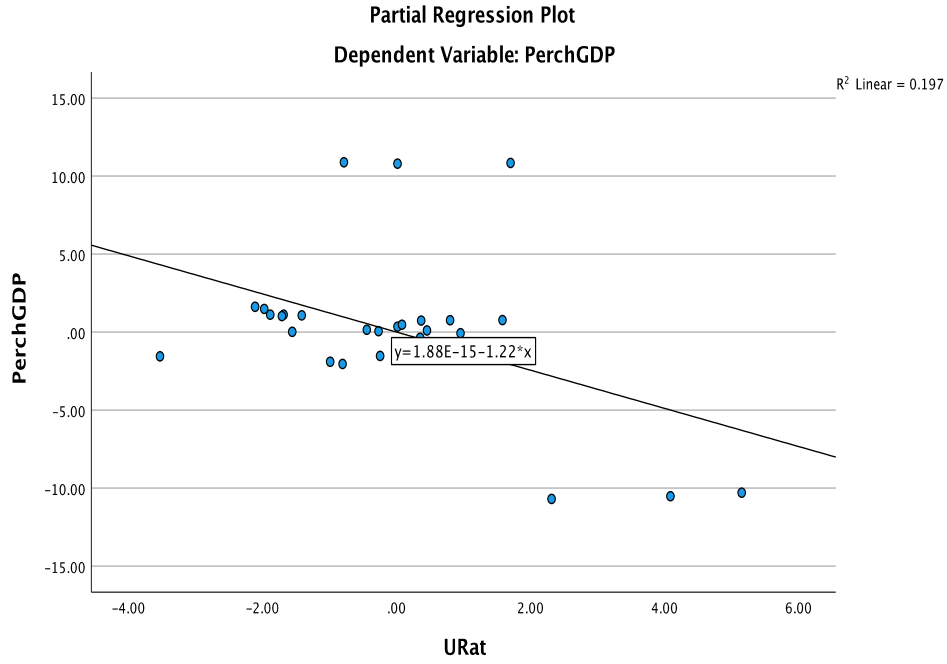

Table 22: Interview Questionnaire for Participants

Participants Name…….

Section A: The Keynesian Model

Question 1: Do you think the changes in households' disposable personal income (DPI) and support to small businesses from direct government transfer payments help raise the GDP during the COVID-19 pandemic?

Response:……

……

Question 2: To what extent do you think increased personal consumption expenditure (PCE) helps boost economic activities during the COVID-19 pandemic?

Response……

……

Question 3: Do you think the changes in the unemployment rate due to COVID-19 correlate with economic activities?

Response:……

……

Question 4: Do you think the absence of government intervention could lead to increased economic activity?

Response……

……

Question 5: What is your overall assessment of the government's use of fiscal intervention to address the COVID-19 shock?

Response……

……

Section A: The Monetarist Model

Question 1: To what extent do you think the interest rate (INT) reduction raises the GDP growth rate?

Response……

……

Question 2: Do you think the falling unemployment rate (UR) resulting from money injection and altering the reserve requirements leads to GDP growth?

Response……

……

Question 3: Do you think changes in the inflation rate (IFL) could be associated with the change in GDP growth?

Response……

……

Question 4: To what extent do you think the absence of monetary policy intervention could lead to increased economic activities?

Response:……

……

Question 5: What is your overall assessment of the government's use of monetary policy measures to address the COVID-19 shock?

Response……

……

Date: Beginning Time: Finishing Time: