

## **COMPARATIVE ANALYSIS OF MONETARY POLICY DYNAMIC DURING COVID PANDEMIC: ACROSS COUNTRY STUDY OF INDIA AND CHINA.**

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### **Abstract**

This research paper delves into a comparative analysis of monetary policy dynamics during the COVID-19 pandemic, focusing on two major Asian economies: India and China. It investigates the impact of the pandemic on these countries' monetary policies, particularly the Repo Rate in India and the Loan Prime Rate in China, and their responses to the economic challenges posed by the global health crisis. The study employs a comprehensive research methodology, combining event study analysis and regression analysis to assess the significance of the Consumer Price Index (CPI) and real Gross Domestic Product (GDP) in predicting changes in policy interest rates. The findings reveal distinctive approaches taken by India and China in response to the pandemic. India implemented rate cuts to stimulate economic growth and support financial stability, while China maintained a more restrained approach, emphasizing stability and sustainable development. Event study analysis indicates statistically significant abnormalities in policy interest rates in China, while such changes in India were found to be statistically insignificant. This research contributes to the understanding of how economic policies have been shaped by the unprecedented challenges of the COVID-19 pandemic. It highlights that monetary policy responses to unexpected events can be sporadic and may not align with theoretical models based on historical economic indicators. The study underscores the importance of adaptability and pragmatism in economic policy-making during times of crisis.

**Keywords:** Monetary Policy, COVID-19 Pandemic, Repo Rate, Loan Prime Rate, Event Study Analysis, Regression Analysis, Consumer Price Index, Real GDP, Economic Policy.

### **Background of the Study**

#### **Introduction to Monetary Policy**

Monetary policy refers to the actions and decisions a central bank or monetary authority takes to control and regulate an economy's money supply, interest rates, and credit. These measures are implemented to achieve macroeconomic objectives such as price stability, economic growth, and financial stability. The significance of money in economic life has made policymakers attach importance to monetary policy, especially to achieve macroeconomic stability (Vishwanath, 2023). The principal objective of the monetary authority in formulating and implementing monetary policy is to achieve and maintain price stability and nurture and maintain a stable financial system. Monetary policy stabilizes economic growth and controls inflation (Quốc & Huy, 2013). In times of economic downturn, such as the Covid recession, monetary policy becomes even more crucial in mitigating the negative impacts on financial markets. During recessions, when economic output declines and unemployment rises, central banks can lower interest rates or expand the money supply to encourage consumption and investment, thereby stimulating economic growth. Monetary policy tools, including both traditional (conventional) and unconventional measures, aim to achieve price stability in the economy while fostering economic growth and development. Conventional strategies involve regulating lending and bank interest rates. During economic uncertainties, policymakers strive to restore stability by reducing interest rates and facilitating credit accessibility (Li et al., 2020, [5]). This stimulates productive capacity, narrowing the output gap. Additionally, by increasing credit availability on the consumer side, there is a boost in demand, which subsequently lowers the general price level by enhancing aggregate supply.

This proactive approach to managing credit availability empowers policymakers to uphold financial and economic stability, particularly in the face of cyclical economic fluctuations. However, it is crucial to acknowledge that unforeseen events or shocks can disrupt economic operations.

### **Brief About Policy Interest Rate**

The policy interest rate refers to the rate at which central banks lend money to commercial banks, serving as a benchmark for other economic interest rates. In the case of India, the policy interest rate is determined by the Reserve Bank of India, the country's central bank. It is known as the Repo Rate in India. The Repo Rate is an instrument the Reserve Bank of India uses to implement its monetary policy. On the other hand, in China, the policy interest rate is set by the People's Bank of China, the country's central bank. The policy interest rate in China is known as the Loan Prime Rate and is used to guide lending rates in the country. The policy interest rates in both India and China play a crucial role in shaping their respective monetary policies during the COVID-19 pandemic. It is important to note that the approaches taken by India and China regarding their policy interest rates have differed in response to the pandemic. India has implemented several measures to address the impact of COVID-19 on its economy. The Reserve Bank of India has cut its policy interest rate, the Repo Rate, multiple times to provide monetary stimulus and support economic growth. These rate cuts aimed to lower borrowing costs for businesses and individuals, encouraging economic spending and investment. In contrast, China has taken a more restrained approach with its policy interest rate during the pandemic. The People's Bank of China has maintained a relatively normal monetary policy stance, avoiding excessive stimulus measures like unlimited quantitative easing or negative interest rates. China's policy interest rate, the Loan Prime Rate, has remained relatively stable during the pandemic.

### **Normal economic cycle and Its disruption by unpredictable events.**

The normal economic cycle, often called the business cycle, is a current Economic growth and contraction that economies experience over time. It typically consists of four phases: expansion, peak, squeeze, and trough. During the expansion phase, the economy grows, increasing employment, production, and consumer spending. This is the period of prosperity and optimism when businesses thrive and investments surge. However, many predicted events can disrupt this economic rhythm, including financial crises, geopolitical tensions, or natural disasters. These events can send shockwaves through the economy, altering the course of the normal cycle. Predicted events, such as a sudden increase in oil prices or an impending recession, can lead to uncertainty and disrupt business and consumer confidence. Central banks employ monetary policies to counter these disruptions and maintain economic stability. These policies can be broadly categorized into conventional and unconventional measures. Conventional Monetary Policies involve the central bank's use of tools like interest rate adjustments to control the money supply. For instance, central banks may lower interest rates during an economic downturn to encourage borrowing, spending, and investments. This conventional method aims to stimulate economic growth and stabilize prices. Unconventional Monetary Policies involve using unconventional tools, such as large-scale asset purchases and forward guidance. Central banks may resort to these unconventional measures to tackle the challenges of severe disruptions. For example, central banks may purchase government securities during a financial crisis to inject liquidity into the financial system. This aims to stabilize the banking sector and restore confidence. Predicted events can trigger the need for unconventional policies, as they require a more aggressive response to safeguard the economy. In these situations, central banks act as the stabilizing force, using unconventional tools to mitigate the impact of predicted events.

### **I. Literature Review**

The advent of the novel coronavirus originating in China heralded a global emergency, culminating in the declaration of a pandemic that profoundly impacted economies worldwide. In response to this multifaceted challenge, policymakers globally deployed monetary policies as a critical tool to navigate the economic fallout. The core objective was to manipulate the availability of funds within the financial system, thereby orchestrating changes in interest rates and asset prices.

These alterations in the financial landscape, in turn, instigated shifts in consumption and investment dynamics, thereby creating a conducive environment for economic stability and growth. This study critically examines the intricate ramifications of the COVID-19 pandemic on policies in the economies of India and China. Additionally, it sheds light on the instrumental role played by the monetary policies executed by the central banks in these nations in mitigating the adverse effects of the pandemic. The onset of the novel coronavirus originating in China ushered in a global emergency, prompting the declaration of a pandemic that had far-reaching implications for economies worldwide. This crisis significantly impacted output yields, investments across industries, and the consumption habits of households. In response to this multifaceted challenge, policymakers globally turned to monetary policies as a critical tool to navigate the economic fallout. These adjustments in the financial landscape, in turn, set off a chain reaction, leading to shifts in consumption and investment dynamics crucial for sustaining and fostering economic growth. This study critically analyzes the intricate ramifications of the COVID-19 pandemic on consumption, manufacturing, and investment in the economies of India and China. Moreover, it delves into the influential role played by the monetary policies implemented by the central banks in these nations in mitigating the adverse effects of the pandemic.

## II. Research Gap

The research currently in publication delves deeply into the effects on national economies of abrupt halts to economic activity, whether brought on by global pandemics or financial crises. It frequently emphasizes how crucial monetary easing policies are to increase the money supply during these crises to restore economic stability. However, there is a dearth of comprehensive studies on the precise implications of monetary easing policies in reducing the negative consequences of pandemics, particularly concerning economies such as India and China. Consequently, this paper aims to thoroughly analyze the direct consequences of monetary easing policies on the money supply in the economy, with a particular emphasis on pandemic scenarios and consideration of the novel and unprecedented challenge presented by the COVID-19 pandemic. While many studies have examined the more general effects of fiscal and monetary policy on economic performance, this study stands out because it uses a mixed-methodology approach to address the research questions related to the specifics of the COVID-19 issue.

## VI. Scope of the Study

The scope of the study is focused on two significant economies: India and China. It examines the changes in monetary policy decisions implemented following the COVID-19 outbreak in these countries. The study uses an event study analysis and regression analysis to evaluate the significance of the Consumer Price Index (CPI) and Real Gross Domestic Product (GDP) in predicting Repo Rate and Loan Rate Premium. On January 10, 2020, the World Health Organization (WHO) issued a set of directives to global leaders regarding the potential virus outbreak from China. This event served as a central analysis point, establishing a time frame from September 19 to May 20, covering nine months. Data were gathered over 20 years, from January 2000 to May 2020, to provide context for this examination. The study aimed to assess the impact by examining changes in Repo Rate and Loan Prime Rate compared to the shifts in real Gross Domestic Product (GDP) resulting from the announcement of this significant event.



## VII. Objective of the Study

1. Assess the Abnormalities or follow expected patterns in Monetary Policy Responses in response to the COVID-19 outbreak.

2. Examine the Significance of the Consumer Price Index (CPI) in predicting changes in the selected economies' Repo Rate and Loan Prime Rate.
3. Analyze the Role of Real GDP on monetary policy decisions in two major economies, India and China.

## VII. Research Methodology

The research examines the impact of monetary policies on mitigating the effects of the pandemic and supporting economic recovery in India and China. Each country has its unique refinancing operations rate as part of its monetary policies. The study focuses on variables that gauge economic activity, specifically the inflation rate measured through the Consumer Price Index (CPI) and the real GDP. Implementing unconventional monetary policies, including quantitative easing, is anticipated to exert upward pressure on inflation within the economy. Consequently, this is likely to influence prices. Higher inflation rates are expected to boost current expenditures due to elevated expected inflation, leading to an increase in price. This study assesses the influence of the Repo Rate and Loan Prime Rate on an economy's interest rate and real GDP during the COVID-19 pandemic.

### A. Variable and Measures

The research has been conducted concerning the monetary policies of India and China, focusing on their impact on controlling inflation, mitigating the adverse effects of the pandemic, and stimulating overall demand and consumption by moderating inflation rates. The study period spans from the fourth quarter of 2019, which marks the onset of the COVID-19 pandemic, to the third quarter of 2020, the current timeframe. The variables examined in this study include:

- Deviation of Real GDP from its target level.
- The Repo Rate and Loan Prime Rate are expressed as a percentage.
- The inflation rate over the preceding four quarters.

### Method and Tools

The study employs event study analysis and regression analysis to evaluate the impact of the COVID-19 pandemic on monetary policies. These tools are used to assess the significance of CPI and real GDP in predicting the Repo Rate and Loan Prime Rate and to draw conclusions based on the analysis.

### Event Study Analysis

The event study methodology is essentially an empirical evaluation of the abnormal shifts, whether positive or negative, in performance variables following the announcement of a specific event. In this context, the abnormal changes in the Repo Rate and Loan Prime Rate were calculated monthly throughout the event window, spanning from September 2019 to May 2020, using the formula:

$$AC_{i,t} = OC_{i,t} - TC_{i,t}$$

Where:

$AC_{i,t}$  signifies the abnormal alterations in the Repo Rate and Loan Prime Rate "i" during the month "t."

$OC_{i,t}$  represents the observed changes in the Repo Rate and Loan Prime Rate "i" during month "t" across the duration of the event window.

$TC_{i,t}$  represents the theoretical changes in the Repo Rate and Loan Prime Rate "i" during month "t" throughout the estimation window. The theoretical fluctuations in the Repo Rate and Loan Prime Rate for each country were computed based on a regression equation with the Repo Rate and Loan Prime rate as the dependent variable and real GDP as the independent variable, depicted as:

**Changes in Interest Rates,  $t = \alpha + \beta$  (Changes in Real GDP<sub>i,t</sub>)**

To gauge the alignment between our theoretical model and reality, we classify observed changes in policy interest rates into distinct categories. This categorization sets the stage for our analysis of abnormalities within the context of policy interest rates, especially in the countries under scrutiny. To methodically evaluate these abnormalities, we employ a statistical tool, namely a cross-sectional Student's t- test. This test quantifies the statistical significance of the disparities between observed and theoretical changes in interest rates, offering a rigorous means of assessing the impact of GDP fluctuation on interest rate policies. This comprehensive approach allows us to establish a theoretical foundation for understanding the relationship between real GDP and interest rates and rigorously evaluate the observed economic responses and their statistical significance in the countries of interest.

$$\text{Student's T Test}_t = \frac{\text{Cumulative Abnormal Change}_t}{\text{Standard error of the TC}}$$

$$\text{Cumulative Abnormal Change}_t = \frac{\sum_{i=1}^N AC_{i,t}}{N}$$

$$\text{Standard Error} = \frac{\sum (Y_i - Y_i')^2}{n - 2}$$

$Y_i$  denotes the values for Observed Changes, while  $Y_i'$  signifies the predicted values or the theoretical changes in the policy interest rates. The estimated values from the t-test are subsequently utilized to evaluate the statistical significance of the abnormal changes observed in policy interest rates in the two countries under examination.

**Regression Analysis**

Our research utilizes an empirical model based on Taylor's framework (Taylor, 1993) to explore the connection between the federal funds rate and key macroeconomic variables such as real GDP and inflation rates in China and India. Our analysis spans the past two decades, including the impact of the COVID-19 pandemic and government monetary policies to manage this crisis.

**Repo Rate and Loan Prime Rate(i) =  $\alpha + \beta_1$  (Consumer Price Index (CPI) in country i) +  $\beta_2$  (Real GDP index in country i)**

Where: CPI represents the Consumer Price Index, a measure of inflation. Real GDP reflects the Real Gross Domestic Product index in country i, typically obtained from open-access sources.  $\alpha$  stands for the intercept term in the equation.

**Empirical Results****Regression (Table 1)**

Table 1 reveals insights into the relationships between policy interest rates and key economic

	India	China
Intercept	6.27	3.01
CPI	0.0085	-0.0030
Real GDP	-0.1421	0.0768
R square	0.0675	0.0687

variables. In India, the intercept, representing the baseline interest rate when CPI and real GDP are zero, is estimated at 6.27.

The coefficient for CPI is 0.0085, indicating that for every one-unit increase in the Consumer Price Index, the policy interest rate is estimated to increase by 0.0085 units, suggesting a positive relationship between inflation (CPI) and interest rates.

In contrast, the coefficient for real GDP is -0.1421, signifying that for every one-unit increase in real GDP, the policy interest rate is expected to decrease by 0.1421 units. This implies a negative relationship between economic growth and interest rates, aligning with traditional monetary policy theory that posits an inverse relationship between real GDP and interest rates. The R-squared value for India is 0.0675, suggesting that the model explains approximately 6.75% of the variance in policy interest rates, indicating the presence of unaccounted factors influencing interest rates. In the context of Interest rates may be used to counteract the effects of inflation and stimulate economic growth in China. The R-squared value for China is 0.0687, reflecting that the model explains approximately 6.87% of the variance in policy interest rates, echoing the presence of unaccounted factors affecting interest rates in the Chinese context. These findings provide valuable insights into the relationship between key economic variables and policy interest rates in India and China. However, they underscore the complexity of the interest rate-setting process, with various other factors that the models do not encompass.

### **Event Study Analysis**

Compared to the cumulative interest rate data, the assessment of unusual shifts in interest rates reveals a noteworthy downward trend in estimates for India. This decline can be attributed to a consistent decrease in observed interest rates, which was prompted by policymakers in India in response to the COVID-19 outbreak. In the Chinese economy, the analysis revealed an inverse relationship between CPI and interest rates. At the same time, real GDP exhibited a positive relationship with the dependent variable. This observation aligns with established monetary policy theory, which suggests that inflation, as indicated by the Consumer Price Index, tends to have an inverse impact on interest rates. At the same time, real GDP maintains a direct relationship with interest rates. The intercept is 3.01, analogous to India, while the coefficient for CPI is -0.0030, revealing a negative relationship between inflation and interest rates. A one-unit increase in CPI results in a minor decrease in policy interest rates. The coefficient for real GDP in China is 0.0768, indicating that a one-unit increase in real GDP is associated with an increase in policy interest rates. Trend was further influenced by the deteriorating accurate GDP forecasts for these nations during the initial three months of 2020, primarily due to extensive nationwide shutdowns imposed by their respective governments. Notably, an intriguing situation arises concerning China's policy interest rates. Despite being the epicenter of the corona virus outbreak, Chinese policymakers opted not to employ monetary relaxation measures, resulting in no discernible changes in policy interest rates. Nevertheless, the Chinese economy faced considerable challenges due to restricted production activities brought on by these shutdowns.

In the case of the Indian economy, a statistical examination using a t-test of abnormal changes yielded insignificant results. This suggests that the unusual shifts in policy interest rates were not significantly influenced by the changes in real GDP brought about by the global COVID-19 pandemic. Conversely, as indicated by the t-test results for abnormal changes, the Chinese economy exhibited statistically significant findings. This leads us to deduce that the absence of variation in policy interest rates, which theoretically should respond to shifts in real GDP, resulted in an atypical pattern in policy interest rates under the current circumstances. However, this peculiarity can be explained by China's tightly controlled economic structure, evident in the consistent policy rates maintained by the country's monetary authorities. To simplify the results of the event study analysis, we can consider a fundamental macroeconomic scenario. This scenario involves the announcement of a global pandemic, expected to affect the existing labor force and the economy's productive capacity in the short term. The pandemic's impact is such that production within the country experiences a significant slowdown, and the limitations imposed by policymakers constrain the economy's demand side. Consequently, real GDP deteriorates in the months following the pandemic announcement as the economy readies itself for a shutdown. Subsequently, as economies lift the restrictions and reopen, governments lower interest rates to stimulate productive capacity and facilitate economic recovery.

This closely mirrors the current market conditions, where major global economies have lowered policy interest rates as part of their monetary expansion efforts in response to the COVID-19 pandemic.

CHINA					
Date	Observed Change%	Expected Change %	Abnormal Change%	Cumulative Abnormal Change	AR T - Test
01-09-2019	-0.038	0.04	-0.078	-0.078	-0.72768
01-10-2019	-0.07	0.04	-0.108	-0.188	-1.00997
01-11-2019	-0.1	0.04	-0.138	-0.324	-1.28823
01-12-2019	-0.12	0.04	-0.162	-0.486	-1.51871
01-01-2020	-0.13	0.04	-0.173	-0.659	-1.81524
01-02-2020	-13.7	0.04	-13.735	-14.394	-128.414
01-03-2020	15.64	0.04	15.597	1.203	145.8241
01-04-2020	-0.24	0.04	-0.276	0.927	-2.58472
01-05-2020	-0.24	0.04	-0.277	0.65	-2.58472

Table2

INDIA					
Date	Observed Change%	Expected Change %	Abnormal Change%	Cumulative Abnormal Change	AR T - Test
01-09-2019	-0.177	-0.011	-0.166	-0.166	-1.13455
01-10-2019	-0.172	-0.004	-0.168	-0.334	-1.14898
01-11-2019	-0.164	-0.011	-0.153	-0.487	-1.05058
01-12-2019	-0.156	-0.011	-0.145	-0.632	-0.99481
01-01-2020	-0.148	-0.011	-0.137	-0.769	-0.93844
01-02-2020	-0.141	-0.011	-0.13	-0.899	-0.8872
01-03-2020	-0.135	0.012	-0.147	-1.046	-1.00322
01-04-2020	-0.275	-0.011	-0.264	-1.31	-1.80783
01-05-2020	-0.275	0.003	-0.278	-1.588	-1.90524

Table3

In summary, the impact of real GDP on policy interest rate changes in India is not statistically significant. Emerging market Countries like China and India exhibit weaker regional identification of policy interest rates than developed economies. This is primarily due to the less mature nature of the policy interest rate systems in emerging countries, coupled with lower levels of marketization and a policy interest rate that has not undergone a free and complete evolutionary process. Mainly since the outbreak of the COVID-19 epidemic, the economic conditions of all countries worldwide have been significantly influenced by the pandemic's impact. Consequently, governments globally have adopted looser monetary policies to inject monetary liquidity, aiming to bolster the role of economic recovery. It is important to note that the abnormal patterns observed, particularly in China, can be attributed to China's tightly controlled economic structure, as evidenced by the consistent policy rates set by its monetary authorities. Overall, governments aim to mitigate the adverse effects of the COVID-19 outbreak on their economies by lowering policy interest rates. During this period, significant economies' lowering policy interest rates stimulated economic development and price levels. This study suggests that changes in monetary policy, prompted by unprecedented events, whether natural or artificial, tend to be sporadic and may not align with theoretical models based on historical observations of macroeconomic variables such as inflation and output.

### Conclusion

Monetary policy provides a means for policymakers to control an economy's money and credit supply, with two opposing approaches: expansionary and contractionary. In times of economic downturn, expansionary monetary policy is often employed to stimulate economic growth by injecting credit into the economy. As economies naturally progress through business cycles, which encompass recession and recovery phases, adjustments to policy interest rates in response to real GDP and inflation changes are customary. However, unforeseen events or natural disasters can disrupt these cyclical economic fluctuations with short-term consequences and potentially long-lasting effects. One such event emerged globally in January 2020 when the World Health Organization officially declared the corona virus outbreak, quickly becoming a worldwide pandemic. Policymakers responded by implementing various safety measures, including national lockdowns, travel restrictions, and curfews.

These events significantly affected production and consumption worldwide, prompting global adjustments in monetary policies to protect productive capacity and prevent economies from slipping into economic recession. This article investigates two major global economies, China and India, focusing on the changes in monetary policy decisions implemented in response to the COVID-19 outbreak.

The assessment utilizes an event study analysis and is reinforced by a regression analysis evaluating the impact of the Consumer Price Index (CPI) and real GDP on policy interest rates in each of these economies.

The event study analysis demonstrates that abnormal changes in interest rates were statistically significant in China. Conversely, these changes were found to be statistically insignificant in the case of India. This suggests that shifts in real GDP did not adequately explain the irregular patterns observed in policy interest rate changes in these economies. In certain instances, changes to interest rates were minimal, as observed in China and Japan. At the same time, in other cases, adjustments were sporadic attempts to counter the economic impacts of the COVID-19 outbreak. This leads to the conclusion that monetary policy changes triggered by unprecedented events, whether of natural or artificial origin, tend to be sporadic and may not adhere to theoretical models constructed based on historical observations of macroeconomic variables like inflation and output. Examining the long-term economic consequences of the COVID-19 crisis on global economies is an ongoing endeavor, given the event's evolving nature, the relatively short event window, and the absence of a post-event window. Future analysis will likely explore the status of monetary policy changes, driven by fluctuations in inflation rates and real GDP resulting from the global pandemic, by the close of 2020.

## References

A Neural Network Scheme for monetary Policy rate validation in Nigeria: Science Publishing Group. (n.d.).

<https://www.sciencepublishinggroup.com/article/10.11648.j.ajai.20200402.13>

Bao, N.K.Q., & Nhut, N.H.H. (2013). A symmetric Interest Rate Pass-Through in Vietnam: Role of Commercial Banks. Social Science Research Network. <https://doi.org/10.2139/ssrn.2338594>

Bernanke, B. (2020). The new tools of monetary policy. *The American Economic Review*, 110 (4), 943–983. <https://doi.org/10.1257/aer.110.4.943>

Düzakın, H., Özekenci, S.Y., & Konak, T. (2022). A NEXAMINATION OF COVID-19' SIMPACT ON BORSAIST ANBUL SECTOR RETURNS WITH A CASE STUDY. *Doğuş Üniversitesi Dergisi*. <https://doi.org/10.31671/doujournal.1061551>

Eichenbaum, M., Rebelo, S., & Trabandt, M. (2020). The Macro economics of epidemics. <https://doi.org/10.3386/w26882>

Ellison, M., & Tischbirek, A. (2014). Unconventional government debt purchases as a supplement to conventional monetary policy. *Journal of Economic Dynamics and Control*, 43, 199–217. <https://doi.org/10.1016/j.jedc.2014.03.012>

Federal Reserve Economic Data | FRED | St. Louis Fed. (n.d.). <https://fred.stlouisfed.org/>

Nath, V., & Agrawal, R. (2022). Barriers to consumer adoption of sustainable products—an empirical analysis. *Social Responsibility Journal*, 19(5), 858–884. <https://doi.org/10.1108/srj-12-2020-0495>

Quốc, B.N.K., & Huy, N.N.H. (2013). Empirical evidence of a symmetric interest rate Pass-Through in Vietnam. *Journal of Asian Business and Economic Studies*, 218, 79–93. <https://doi.org/10.24311/jabes/2013.218.04>

Sun, Y., Bao, Q., & Lu, Z. (2021). Corona virus (Covid-19) outbreak, investor sentiment, and medical portfolio: Evidence from China, Hong Kong, Korea, Japan, and U.S. *Pacific-Bas in Finance Journal*, 65, 101463. <https://doi.org/10.1016/j.pacfin.2020.101463>



Taylor, J.B. (1993). Discretion versus policy rules in practice. Carnegie -Rochester Conference Series on Public Policy, 39, 195–214. [https://doi.org/10.1016/0167-2231\(93\)90009-1](https://doi.org/10.1016/0167-2231(93)90009-1)

Tchereni, B.H.M., Makawa, A., & Banda, F. (2022). Effectiveness of the Asset Price Channel as a Monetary Policy Transmission Mechanism in Malawi: Evidence from Time Series Data.

International Journal of Economics and Financial Issues, 12 (5), 160–168. <https://doi.org/10.32479/ijefi.13405>

The Great Lock down: worst economic down turn since the Great Depression. (2020, April 14). IMF. <https://www.imf.org/en/Blogs/Articles/2020/04/14/blog-weo-the-great-lockdown-worst-economic-downturn-since-the-great-depression>

Vishwanath, M. (2023). A Neural Network Scheme for Vali dating Monetary Policy Rates in Nigeria.

A Neural Network Scheme for Vali dating Monetary Policy Rates in Nigeria. <https://doi.org/10.31219/osf.io/rk5b2>

Wynne, M.A., & Zhang, R. (2017). Estimating the natural rate of interest in an open economy. Empirical Economics, 55(3), 1291–1318. <https://doi.org/10.1007/s00181-017-1315-5>