

Investigating the relationship between inflation, interest rate and unemployment amid Covid-19

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ABSTRACT

Aim: The aim of the journal is to evaluate the relationship between inflation rate, interest rate and the unemployment rate during Covid-19.

Method: The study would proceed with secondary quantitative within which the data would be collected through the existing researches and annual reports. The data collection process would revolve around Covid-19 and the rise in inflation, interest and unemployment rate during this period. The data would comprise of 10 observations that would help to analyze through annual reports based on last five years. The outcome of journal would comprise of identifying the rise in uncertain activities during Covid-19 leading towards rise in complications.

Findings: It was found that inflation and un-employability are the dependent variables whereas interest rate is the dependent variable. The data analysis would comprise of descriptive, correlation and regression analysis which would help to identify the relation between inflation, interest rates and un-employability. The data sources would also include international monetary fund, annual reports and World Bank.

Keywords: *Inflation, interest rates, Covid-19, unemployment*

INTRODUCTION

The relationship between interest rates, inflation, and unemployment for a country has been one of the most important and highly debated subjects in policy making circles of macroeconomics (Burdeken et al., 2020). Interest rate is a key policy tool of central banks of all countries which depicts the cost of borrowing, and conversely it also represents the reward of saving capital (Agenor et al., 2018). If interest rate is high, high cost of borrowing discourages the common public as well as business organizations from borrowing from private or government lenders such as banks. Alternatively, low interest rate encourages borrowing. Consequently, interest rate is also influential on supply of money and goods in a given market scenario. Although theoretically, the relationship between interest rate and inflation is majorly understood, the recent Covid-19 pandemic has thwarted the conventional relationship (Grohe et al., 2022). The multifarious devastating impact of the Covid-19 distorted markets which were already facing the issue of shrinking investment due to a short-term recession and United States-China trade war (Sheng et al., 2021). The rate of price growth over a given time period is known as inflation. Sometimes the level of inflation is expressed in general terms, such as the net price increases or the rise in the cost of living across the board.

The requirements of a fulfilled life in human civilization is defined by attempting to acquire items more than one's basic survival needs. While this includes shelter, food, and healthcare, modern economics also include secondary requirements such as productivity, entertainment, and energy supply in this category (Kotler et al., 2019). These include both services and merchandise like workforce, recreation, and medical services as well as necessities like grain crops, metals, and fuels. They also consist of transit and electricity. The purpose of keeping an eye on inflation is to determine the overall effect of price increases for a variety of goods and services. The Phillips curve shows a consistent negative relationship between inflation and unemployment (Alisa et al., 2015). Conversely, higher unemployment results in reduced inflation. Demand rises when more people seek employment and have more expendable income. After that, price inflation happens quickly. In the 1960s, there was a widespread belief that any fiscal stimulus would boost overall demand and cause any further impacts (Alisa et al., 2015). As labor demand increases and fewer people are unemployed as a result, companies raise compensation to remain competitive and attract

talent from a smaller talent pool. Corporate payroll expenditures increase, and companies pass those costs on to customers by raising the price of goods and services.

The current research aimed at examining the influence of interest rate on monetary price inflation and unemployment amidst Covid-19 pandemic. To realize this aim, the research is based on following objectives:

- To assess the impact of central bank's interest rate on price inflation during Covid-19
- To evaluate the impact of interest rate on unemployment during Covid-19
- To examine the influence of Covid-19 on the changing dynamics among interest rate, inflation, and unemployment.

LITERATURE REVIEW

Monetary and fiscal policy tools are utilized by central banks to harness the beasts of inflation and unemployment, which can wreak havoc on a country's long term growth trajectory. Although interest rate is the most widely used policy tool in this regard, its effectiveness and sustainability of usage has been debated (Pettifor, 2017). In recent years, interest rates have progressively fallen, lately becoming negative in Europe and Japan. Monetary policies that address the extended end of the yield curve are less harmful to financial performance than those targeting the shorter end when market interest rates are negative but deposit rates are retained at zero (Summers et al., 2015). Thus, when interest rates are negative and additional monetary accommodating policies are needed, special attention must be paid to quantitative easing and yield curve adjustment. Since retail deposit rates have been kept at zero for so long, bank performance would be affected (Reis, 2020). In a scenario where interest rates are negative, further rate decreases might be detrimental to bank profitability, especially if they persist.

Central banks all around the world started to become increasingly active when the COVID-19 pandemic suddenly spread and implemented a variety of monetary measures to assist alleviate the negative shocks and rebuild the economy. Long et al. (2021) claim that the Covid-19 outbreak has made the unemployment and inflation issues worse. More importantly, even while it is unable to

diminish the shock that the Covid-19 is having on the unemployment rate, central bank intervention helps to offset the inflation pressure that the Covid-19 is starting to impose. Research by Ha et al. (2022) demonstrates that government initiatives, such as health and strict controls, to mitigate the negative consequences of the pandemic on inflation and unemployment have no effect.

The multifarious impact of the Covid-19 pandemic is complicated to quantify in terms of its macroeconomic implications. Evidence shows that economic activity started to significantly slow down at the end of the first quarter, despite the fact that there is still a great deal of uncertainty regarding the pandemic's trajectory and its effects on the global and American economies (Song et al., 2020). In addition to those who have Covid-19, others must adhere to obligatory social segregation laws and shelter-in-place orders, which invariably impede corporate operations. Due to these factors, people and companies tend to cut back on purchases of non-essential products and services. The consumer price index had its fastest 12-month price increase in more than 30 years between October 2020 and October 2021, at 6.2 percent (Lea, 2022). Since the original Covid-19 wave had the opposite impact, it may appear contradictory that the pandemic is to blame for this phenomenon. The CPI only increased by 0.1 percent between May 2020 and May 2021, as the price of oil briefly fell in April 2020 (Lea, 2022). The epidemic also affects the flow of imported products, which drives up their cost. This directly occurs as diseases and lockdowns abroad impede manufacturing; for example, a shutdown in Vietnam in August impacted the supply of computer chips. Border constraints connected to Covid may also make it more challenging to coordinate manufacturing across borders (Lee et al., 2020). These trends indicate that the pandemic has broken the fundamental understanding of the traditional economic principles, thus exposing central banks and associated governments to policy risks.

H₀₁: Interest rate has no significant relationship with inflation during the Covid-19 pandemic

H₁: Interest rate is significantly and negatively impactful on inflation amid Covid-19

The impact of Covid-19 has been felt on the conventionally stable supply and demand networks of commodities. In the United States, the work force decreased due to Covid-19, and it was more

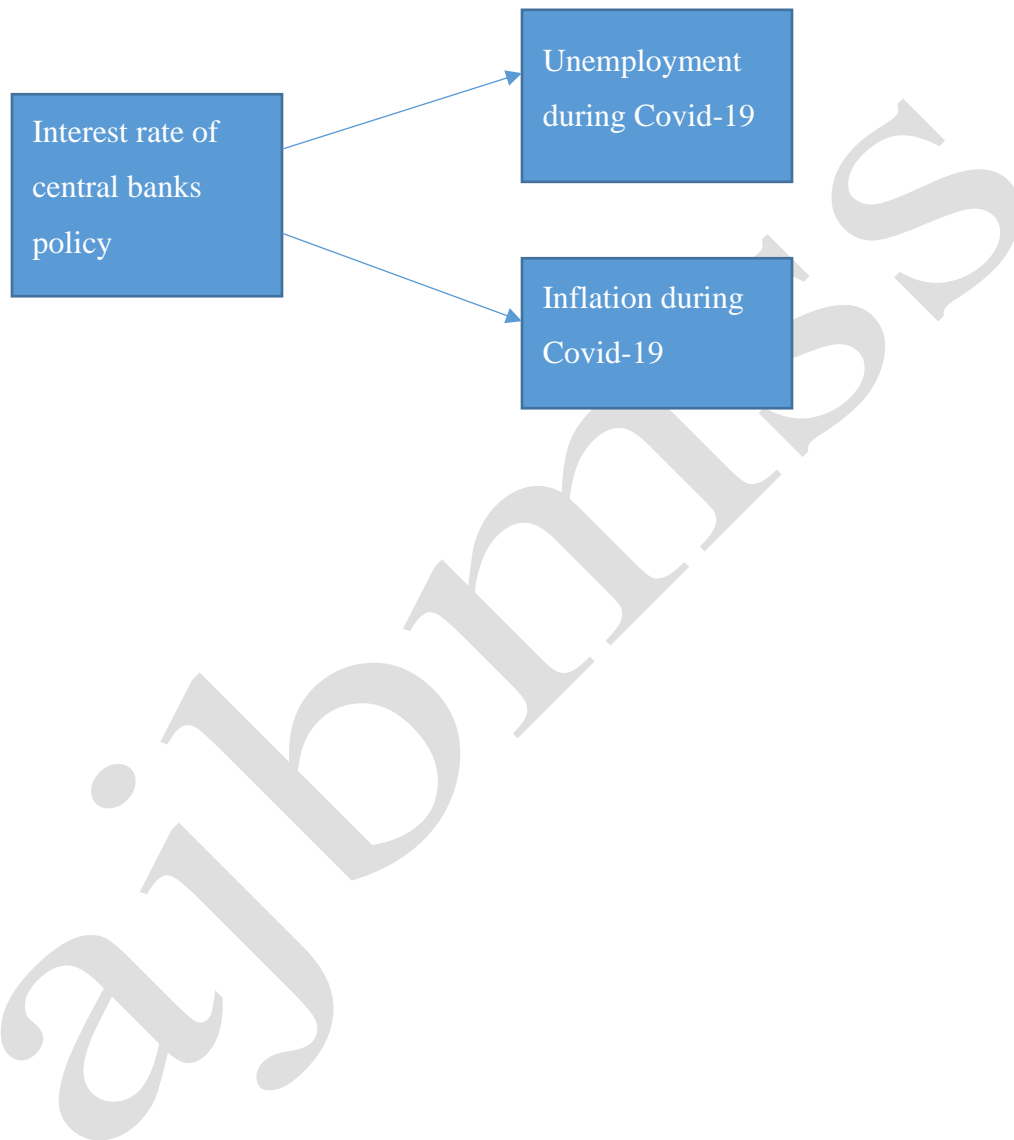
than 2 million fewer in November than it was in February 2020 (Wilensky, 2021). Some of this drop can be attributed to employees who, out of (reasonable) fear of contracting COVID at work, temporarily quit the workforce or retired. A significant rise from 48.1 percent two years prior, as of the third quarter of 2021, 50.3% of Americans aged 55 and older were retired (Auerbach et al., 2017). The number of women aged 25 to 44 who were employed decreased by 341,000 (1%) compared to only 6,000 males in the same age group (Edwards, 2020). The difficulties of pandemic parenting, being a persistent issue, may be reflected in this difference. Continuous shrinkage of the workforce not only creates a persistent problem of unemployment, it is also having repercussions for the general standard of living in both the developed and developing countries (Cristea et al., 2020). During a rapid expansion of global economics catalyzed by the multipronged phenomenon of technology-based globalization, many countries such as India, Pakistan, and United States are already facing rising inequality. This poses a direct threat to their economic growth and indirect threat to their political and social strata.

Pandemics drastically destabilize a functioning civilization. Disturbances in the economy and society have a variety of effects on people's mental and physical wellbeing (Wu et al, 2020). Additional factors that lead to an increase in mortality, such as early deaths, include health care interruptions, staying away from hospitals, and postponing scheduled medical treatment. Thebault, Tran, and Williams (2020) and Wade (2020) discovered that people of color lived in locations with disproportionately higher unemployment rates, COVID-19 mortality, hospitalization rates, and financial troubles. On the other hand, some traits boost the adaptability of people and civilizations. India's informal workers, who make up the vast majority of the working population (more than 93%), experienced prolonged periods of no work, many of whom were on the verge of starvation as a result of lockdowns and suspended transportation services that prevented them from getting to their places of employment (Eckert, 2020).

H₀₂: Interest rate has no influence on the unemployment of countries during Covid-19

H₂: Interest rate is significantly and positively impactful on unemployment during Covid-19

Conceptual framework



RESEARCH METHODOLOGY

Research Philosophy

Research philosophy is the set of principles, concepts, and ideas that serve as the foundation for conducting research and guide the researcher's choices (Zukauskas, Vveinhardt and Andriukaitiene, 2018). There are various research philosophies, including pragmatism, positivism, and realism. The positivist research philosophy is chosen for the planned study in order to adhere to empirical understanding of the topic attained via observational data (Singh, 2022). It aids in determining the connection between unemployment, interest rates, and inflation during the COVID-19 crisis. In this situation, the positivist research methodology enables the researcher to analyse social world observations. According to a study, the positivist research philosophy can assist researchers determine the best methods for analysing variables (Pham, 2018). This perspective assisted in the collection of secondary information for the current study's evaluation of the impact of interest rates on inflation and unemployment during the Covid-19 pandemic. Additionally, it aids in making thorough assessments on the study topic in order to address a particular research question. According to studies, adopting the positivist research philosophy aids in the development of a researcher's conceptual knowledge of the subject being studied, which has a favourable effect on how the research is interpreted (Synder, 2019). The positivist research philosophy is ideal for the present study to provide a comprehensive insight of the concrete context of the relationship between the key macroeconomic variables during the pandemic situation.

Research Approach

The research approach assists in appraising the research plan based on which methodology can be adopted. Inductive and deductive research strategies are the two main categories (Themelis, Sime and Thornberg, 2022). The deductive reasoning approach is employed in the planned study to analyse the relationship between the independent and dependent variables. The deductive reasoning, according to Bougie and Sekaran (2019), entails a hypothesis and assumption process by which some an inference is derived that is based on accumulated data analysis. With regard to the relationship between interest rate, inflation, and unemployment rate in the context of the Covid-19 pandemic, this approach aids in establishing a greater understanding of the facts and concepts.

According to a study, the deductive reasoning approach aids in meeting research goals that are developed from certain theories (Melnikovas, 2018). Consequently, based on this argument, it can be maintained that by utilising a deductive reasoning, the planned study's aims can be addressed by evaluating the relevant theories and findings.

Data Collection Method

According to Paradis et al. (2016), choosing the best data collecting strategy is an important step in determining how data will be gathered and what assumptions can be made depends entirely on the methodology and analytical approach. Utilizing the appropriate data gathering technique is crucial if the researcher is to use the data to accomplish the specified research aim and objectives. The secondary quantitative technique has been chosen for the current study to examine the relationship between interest rate, inflation, and unemployment during the Covid-19 pandemic. Data for ten countries was gathered for this purpose from the World Bank, IMF, and financial annual reports. The ten countries selected were the United Kingdom (UK), United States of America (USA), Turkey, Malaysia, Bangladesh, Canada, Japan, Korea, Egypt, and Australia. For the ten chosen countries, data covering the previous five years (2017–2021), including interest rates, inflation, and unemployment rates, was obtained. The rationale for secondary quantitative research is that it enables the researcher to compile already-existing data on the topic and statistically evaluate it in order to address the concerning the research question (Williams and Shepherd, 2017).

Data Analysis

Analysis is a crucial step in interpreting the data that has been acquired for addressing a research topic after the required information has been compiled. To examine the relationship between the research variables, the method of data analysis often entails analysing the data that was obtained and describing it using analytical or quantitative logic (Li, Higgins and Deeks, 2019). The interest rate was used as an independent variable for determining the variables. In contrast, unemployment and inflation were treated as independent variables. SPSS was used for data analysis. In order to analyse the data, descriptive statistics were used. The trends of interest rates, inflation, and unemployment were represented by graphs. Correlation analysis was used to examine the

relationship between interest rate, inflation, and unemployment rate. In order to assess the relationship between the dependent variables (inflation and unemployment) and the independent variable, linear regression analysis was used (interest rate).

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RESULTS

Descriptive Statistics

Table 1 shows the descriptive statistics, including means and standard deviations for the study variables that are, interest rate, inflation and unemployment

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Inflation (%)	50	-1.10	29.50	4.4380	5.85930
Interest Rate (%)	50	-.10	22.50	3.8710	5.48838
Unemployment (%)	50	2.40	13.74	5.8364	3.03001

Table 1 Descriptive Statistics for Interest Rate, Inflation and Unemployment

Given that information was gathered for 10 countries between 2017 and 2021, it is clear from the above table that there were 50 total observations, which are represented by the letter N. Regarding inflation, it can be noted that the average interest rate is 4.4380, with a standard deviation of 5.85930. According to this, the average inflation rate across the countries is currently 4.4380%, with a projected deviation of 5.85930%. The present study has also taken interest rates into account. It is clear from the data that interest rate has a mean value of 3.8710 and a standard deviation of 5.48838. It was suggested that the ten countries' average interest rates were found to be 3.8710%, with a predicted deviation of 5.48838%.

Additionally, the unemployment rate has been considered. With reference to the table above, it can be observed that the unemployment rate's average value is 5.8364 and its standard deviation is 3.03001. It demonstrates that the average unemployment rate is 5.8364%, with a probable deviation of 3.03001%.

Graphical Representation

The following graph shows that trend in inflation, interest rate and unemployment rate for the ten countries for the years 2017-2021 in the COVID-19 scenario.

Figure 1 shows the inflation, interest rate and unemployment during the years (2017-2021). The following graph depicts a surge in inflation, interest rates and unemployment during the peak pandemic years. The peak then flattens depicting how the countries were able to normalize the surges in macroeconomic variables to the pre-pandemic levels.

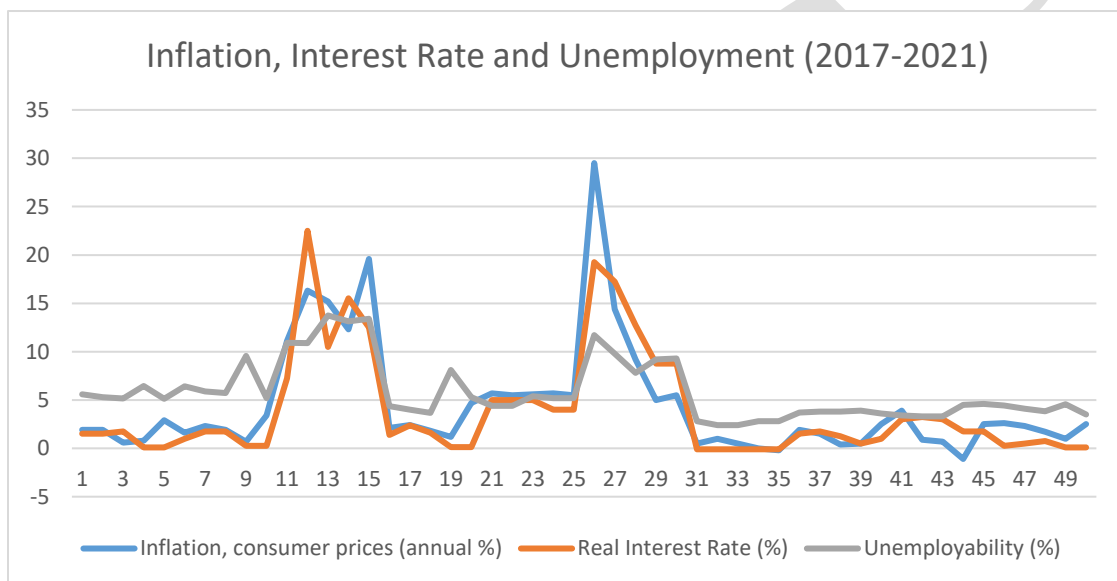


Figure 1 Inflation, Interest Rate and Unemployment (2017-2021)

Correlation Analysis

Table 2, shows association between variables involved in this research, namely interest rate, inflation and unemployment for the ten countries during the past five years in the context of the COVID-19 pandemic.

Correlations

		Inflation (%)	Interest Rate (%)	Unemployment (%)
Inflation (%)	Pearson Correlation	1	.887**	.791**
	Sig. (2-tailed)		.000	.000
	N	50	50	50
Interest Rate (%)	Pearson Correlation	.887**	1	.777**
	Sig. (2-tailed)	.000		.000
	N	50	50	50
Unemployment (%)	Pearson Correlation	.791**	.777**	1
	Sig. (2-tailed)	.000	.000	
	N	50	50	50

** . Correlation is significant at the 0.01 level (2-tailed).

Table 2 Correlation Analysis

It is imperative to note that inflation has a positive and strong association with the interest rate as well as employment, as the coefficient value is found to be 0.887. Thus, it shows that an increase in the interest rate causes an increase in the inflation. Similarly, a strong positive association was found between the inflation and unemployment as deciphered by the Pearson co-efficient value of 0.791. Likewise, a strong and positive correlation was observed between the interest rate and unemployment as depicted by the co-efficient value of 0.777. It can be interpreted from the correlation analysis that all the three macroeconomic variables are co-related. An increase in one variable is followed by a subsequent increase in the other two variables as well. This is in line with the concept that as inflation increase the interest rate also follows a subsequent increase. This is because the lenders are well aware of the fact that a higher inflation will lead to a decline in the value of the money over the period of loan, so as a consequence the lending bodies raise the interest rates. Similarly, it the correlation between the interest rate and unemployment is also well-established and the findings of the current analysis coincide with the conceptual link between the two variables. A rise in interest rate leads to a simultaneous increase in the rate of unemployment.

This is because the higher interest rates impede the hiring mechanism of the corporate sector linked with business expansion.

Regression Analysis

a) Interest Rate and Inflation

Table 3a shows the results for the regression analysis between interest rate and inflation. Interest rate was the independent or predictor variable and inflation was kept as the dependent variable. It can be inferred from the table that there is no significant association between the interest rate and inflation as p-value is greater than 0.05 (p-value= .110).

Model		Coefficients ^a						
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.771	.474		1.626	.110	-.182	1.724
	Interest Rate	.947	.071	.887	13.336	.000	.805	1.090

a. Dependent Variable: Inflation

Table 3a Regression Analysis for Interest Rate and Inflation

However, according to Table 3b the value of R Square shows that 78% variance in inflation is explained by the interest rate. This means that inflation may change with interest rate to a considerable extent up to 78%.

Regression Statistics	
Multiple R	0.887390832
R Square	0.787462489
Adjusted R Square	0.783034624

Standard Error	2.729234611
Observations	50

Table 3b Regression Analysis

b) Interest Rate and Unemployment

Table 4 shows the results of regression analysis for the interest rate and unemployment. The interest rate was selected as the independent variable and unemployment was kept as the dependent variable. From the table below it can be deduced that there is a significant relationship between the interest rate and the unemployment rate as p-value is less than 0.05 (p-value=0.000).

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)	4.176	.335		12.478	.000	3.503	4.849
	Interest Rate	.429	.050	.777	8.551	.000	.328	.530
a. Dependent Variable: Unemployment								

Table 4a Regression Analysis for Interest Rate and Unemployment

Furthermore, the Table 4b shows that the value of R Square is 60%, which indicates that 60 variation in the unemployment rate is explained by the interest rate.

<i>Regression Statistics</i>	
Multiple R	0.77697
R Square	0.603683
Adjusted R Square	0.595426
Standard Error	1.927274
Observations	50

DISCUSSION

It is been analyzed from the above results that there is an increasing trend between the inflation and the interest rates. The above results also depict a variance of 78% in the inflation rate which is effected due to the interest rates. It was also demonstrated during the simple linear regression model that there is a significant relationship between the interest rate and unemployment. It was found that inflation and un-employability are the dependent variables whereas interest rate is the dependent variable. It is being discussed that Covid-19 has led towards affecting the economic stability of the countries which has lead towards increasing inflation across the globe. The rise in interest rates results in increasing the inflation and un-employability which effected majority of the individuals. The relation between the interest rate and un-employability is significant as the p-value is 0.000 which means that the rise in interest rate results in increasing the unemployment. The journal identifies the interest rate is significantly and negatively impactful on inflation during Covid-19. It demonstrates that Covid-19 resulted in economic instability in different countries which led towards the rise in interest rates and inflation. Furthermore, it is also highlighted that interest rate is significantly and positively impactful on unemployment during Covid-19. The journal further demonstrates that the rise in inflation results increasing the interest rates which effect majority of the unemployed individuals due to unaffordability.

	Hypothesis Statements	Accepted	Rejected
H0a	Interest rate has no significant relationship with inflation during the Covid-19 pandemic	✓	

H1a	Interest rate is significantly and negatively impactful on inflation amid Covid-19		✓
H0b	Interest rate has no influence on the unemployment of countries during Covid-19		✓
H1b	Interest rate is significantly and positively impactful on unemployment during Covid-19	✓	

CONCLUSION AND FUTURE IMPLICATION

The aim of the current research was to analyze the association of interest rate, inflation and unemployment amidst COVID-19 pandemic. To address this aim, three main hypotheses were developed. The findings revealed that strong and positive correlation existed between the three macroeconomic variables. The rise in inflation, interest rates and unemployment were mutually related. In particular during the peak years of pandemic, these variables were higher. The research emphasized the importance of economic stability in times of crisis and how one economic variable affects the other. A balance between these variables is significant to maintaining the economic equilibrium. Further, findings in the current study have also revealed that the interest rate affects employment. A higher interest rate impedes the company's hiring process for business expansion and subsequently elevates unemployment rates. Likewise, the study also revealed that interest rate and inflation are also related. A higher inflation rate leads to the lenders imposing greater interest rates in consequence of a decline in the money value.

Thus, findings in the current study have significantly helped in bridging the gap in previous literature and studies, related to the association between interest rates, inflation and unemployment rates during the pandemic period by extracting data from ten different countries. An analysis of the macroeconomic situation of the countries during pandemic shows that how crisis situations lead to economic stability and how the countries across the globe have worked to stabilize the economic alterations caused by the pandemic.

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