Impact of Interest Rate Changes on Inflation in the United States of America

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DOI: https://dx.doi.org/10.47772/IJRISS.2025.909000593

Received: 13 July 2025; Accepted: 18 September 2025; Published: 21 October 2025

ABSTRACT

The study sought to examine the impact of interest rate changes on inflation in the United States of America. This study took a quantitative, descriptive approach using a time series regression design to examine how real interest rates have influenced inflation in the United States from 2000 to 2023. Annual data was collated from TheGlobalEconomy.com, which included inflation figures (as measured by the Consumer Price Index), real interest rates (adjusted using the GDP deflator), and a variety of macroeconomic control variables. These variables included capital investment, household consumption, unemployment, foreign direct investment, government spending, government debt, population growth, and health spending, all expressed as percentages of GDP or annual rates. To analyse the data, a multiple linear regression model using Ordinary Least Squares (OLS) was estimated in Stata. This study challenges conventional macroeconomic theories that suggest a negative correlation between interest rates and inflation in the US by examining the complex relationship between these two variables. With a coefficient of 0.770 ($p = 0.021$), the study's analysis of a strong dataset shows a positive relationship between real interest rates and inflation. According to this finding, inflation dynamics are significantly shaped by variables outside the purview of traditional economic models, such as investment patterns and consumer expectations. Household consumption (3.71, $p = 0.001$) and capital investment (1.91, $p < 0.001$) are also identified in the analysis as important drivers of inflation, suggesting that rising prices are caused by increased demand in these sectors. On the other hand, a significant inverse relationship between inflation and health spending (–1.02, $p = 0.019$) suggests that increasing health spending could help stabilise prices by diverting money from industries that are more susceptible to inflation. Furthermore, there is a marginally positive correlation between government debt and inflation (0.063, $p = 0.028$), which calls for more research on the relationship between inflationary pressures and future spending expectations. The overall validity of the model is unaffected by the average Variance Inflation Factor (VIF) of 8.03, which suggests possible multicollinearity among variables such as unemployment and government spending. The intricacies this study uncovered highlight the necessity for monetary frameworks to be modified by policymakers in order to better reflect how consumers react to changes in interest rates.

Keyword: Interest rate, inflation

INTRODUCTION

Inflation has been a key global concern over the past five years. These significance fluctuations are influenced by several factors, such as economic recovery post-COVID-19, supply chain disruptions, and geopolitical tensions. The global inflation rate was recorded as 2.4%, 4.7%, 8.8%, and 6.5% in 2020, 2021, 2022 and 2020 respectively. Similar factors affecting global inflation have contributed to a notable increase in the United States (U.S.) inflation since 2021.

The COVID-19 pandemic in 2020 caused consumer spending to decline and inflation to hover around 1.2%. Due to supply chain disruptions and stimulus measures, inflation started to rise sharply and reached roughly 7.0%. Due to rising energy prices and persistent supply chain problems, inflation reached its highest level in more than 40 years in 2022, peaking at about 9.1%. However, as monetary policy changes take effect, inflation has started to gradually decline in 2023 as of mid-year, with rates circling 4.0%.

The expansion of the monetary base or the amplification of liquidity within an economic system were the initial definitions of inflation (Lacheheb& Sirag, 2019). This description relates to the general signs and symptoms of an increase in the money supply, which is thought to have caused prices to rise. In later developments, Gimeno & Ibáñez (2018) define inflation as a continuous increase in the general prices within an economy.

Inflation is greatly impacted by changes in interest rates, especially those set by central banks. Generally speaking, higher interest rates result in less borrowing and spending, which lowers the demand for goods and services and helps control inflation. Lowering interest rates, on the other hand, may boost inflation by boosting economic activity. According to a National Bureau of Economic Research (NBER) study that examined data from 1960 to 2020, a 1% increase in interest rates was linked to a roughly 0.5% drop in inflation over a two-year period. The efficacy of interest rate changes in controlling inflation expectations is demonstrated by this statistical relationship.

Interest, which is usually expressed as a proportionate percentage of the principal amount borrowed, is a financial obligation incurred when borrowing money. Interest rates, which are usually expressed monthly or annually, are a percentage that represents the cost of borrowing or the return on investment over a given time period. (Augustin et al., 2021). Interest is a measurable indicator of the expense incurred when a debtor uses resources that must be paid to creditors. According to van Binsbergen et al. (2022), interest is the term used to describe the payment for using borrowed funds from outside sources. The percentage of capital that is expressed as interest is referred to as the "interest rate."

Given the state of the economy today, the investigation into the "Impact of Interest Rate Changes on Inflation in the United States of America" is extremely pertinent. The Federal Reserve sets interest rates, which are a vital tool for controlling economic stability and growth. Policymakers, companies, and consumers can all benefit from knowing how changes in these rates impact inflation.

One of the main ways that monetary policy affects the economy is through interest rates. We can determine whether current policies are successful in producing desired economic outcomes, such as price stability and sustainable growth, by examining their effects on inflation. Economic stability and purchasing power are directly impacted by inflation. Central banks can maintain target inflation rates, which are normally around 2% in the United States, by making well-informed decisions based on a thorough understanding of how interest rate changes affect inflation. Higher interest rates may be justified in times of price increases, for example, if they are successful in reducing inflation.

The percentage of the principal amount borrowed from outside sources that needs to be repaid is known as the interest rate (Andrade & others, 2018) Interest rates are the compensation paid to those who provide excess funds or spending units for short-term use by those in need who use the money to make up for deficits or spend them. (Renninger & Hidi, 2020) In order to improve people's overall quality of life, banks are commercial organisations that collect money from the general public through savings and then distribute it to the community in the form of credit and other financial instruments.

The number of interest rates varies according to the debtor's ability to provide lenders with a rate of return. When deciding on returns on capital market investments, investors consider the interest rate to be a critical component (Blanchard, 2019). As an alternative investment vehicle, market capital offers a rate of return proportional to a certain level of risk. A consistent, widespread increase in the cost of goods and services over a given time period is referred to as inflation (Lin et al., 2023). A price increase in one or two commodities alone cannot be considered inflation unless it is widespread and causes prices of other goods to rise as a result (Aparicio &Bertolotto, 2020).

This study adopted a descriptive quantitative research design that gave conclusions on the relationship between inflation and interest rate in Swaziland for the period of 2010–2014. Data for the study was analyzed based on Meta-analysis approach because the study was based on secondary data in consonant with Yin (2009) who argued that secondary data analysis enables researchers to analyze a group of data using statistical means in the form of texts, tables and graphs that existed in the public domain.

The impact of monetary policy on inflation and economic activity was studied by Bernanke and Blinder (1992). After a lag period, it was discovered that interest rate changes have a significant impact on inflation, suggesting that monetary policy can regulate inflation. Bernanke and Gertler (1995)studied how monetary policy affected output and inflation. Over time, they discovered that raising interest rates and tightening monetary policy typically resulted in lower inflation.

Taylor (1993), states that when actual inflation deviates from target inflation levels, central banks should modify nominal interest rates. This rule's empirical tests show that following it can stabilise output and inflation. Rudebusch (2002) examined the impact of monetary policy shocks on inflation dynamics in a more recent study. According to the results, raising interest rates may cause inflation to decline significantly over a number of quarters.

Theories

The study focused on Quantity Theory of Money (QTM) and Keynesian Economics Theory.

Quantity Theory of Money

According to this theory, if the money supply expands faster than economic growth, inflation results. In general, higher interest rates deter borrowing and spending, which can slow the expansion of the money supply and aid in keeping inflation under control. According to the Quantity Theory of Money (QTM), price levels and the money supply are directly related. In essence, prices rise proportionately when the money supply rises, and prices fall proportionately when the money supply falls. There have been many different applications and interpretations of this theory over the years.

The quantity equation of money is a logical place to start when conducting an empirical investigation of the relationship between inflation and money growth:

$MV = PY^r$ ……(1) where;

M is the money supply, V is money velocity, Y^r is real expenditure (typically measured by GDP), and P is the price level (measured by the GDP deflator or national consumer prices (CPI)).

The quantity theory's well-known implication is that there is no connection between money growth and real variables, and that the price level is proportional to the money stock over the long term (i.e., if V and Yr are fixed). The empirical literature has concentrated on the idea that "a given change in the quantity of money induces … an equal change in the rate of price inflation" (Lucas, 1980).4. There has been debate in the literature regarding whether money is the only factor influencing price changes and whether a central bank can manipulate the money supply to take advantage of the long-term relationship. Long-term money neutrality might hold, but not immediately.

Due to the influence of other factors that momentarily alter price dynamics and push them away from the equilibrium, the long-run equilibrium relationship (1) might not hold. For instance, investors' short-term portfolio changes may have an impact on money holdings. Furthermore, shifts in interest rates and real income levels may have an impact on money velocity.

According to the literature, inflation is more closely associated with excess money growth, or nominal money that exceeds real GDP. In light of this, empirical tests have frequently employed the following formulation of the growth rate quantity equation:

$\Delta m - \Delta \text{yr} = \Delta p - \Delta v$ (1a)

where "excess" money growth is the annual growth rate of the money stock adjusted for trend GDP growth (in real terms), small letters indicate logs, and Δ stands for (annual) growth rates. It is assumed that velocity is constant.

According to Lucas (1980 and 1996), statistical noise may prevent the relationship between money growth and inflation from being detected in the data. The low-frequency inflation and money growth components would make it more apparent. The "low-frequency component" of money growth and inflation data, which records more consistent, trend-like movements, can be separated from the "high-frequency component," which represents unpredictable or fleeting developments, by applying statistical filtering techniques to the data. It also shows that inflation tends to follow trend money growth in a systematic manner. Both findings are consistent with previous findings for the UK (Benati, 2005) and the US (Lucas, 1980; Sargent and Surico, 2011). These examples imply that, despite variations over time and nations, the relationship between money growth and inflation may hold true for all industrialised nations.

Furthermore, research has indicated that the long-term relationship between inflation and money growth may be impacted by various payment technologies. This argument makes the assumption that the private sector's cash optimisation behaviour evolves over time, resulting in consistently smaller cash holdings in relation to the actual value of goods transactions. If one assumes balanced growth for output, wages, and consumption, this argument can be considered when evaluating the validity of the quantity theory by adjusting the long-run relationship for the effect (Attanasio et al., 2002; Teles et al., 2016):

$$\Delta m_i - \Delta \mathrm{yr}_i + \alpha\, \Delta \mathrm{rs}_i = \Delta \mathrm{p}_i \quad (2)$$

where the (nominal) short-term interest rate is represented by rs, a country is indicated by i, a variable in logs is indicated by small letters, and the other notations are as follows. The term measuring the interest elasticity α captures any potential implications of the private sector's cash optimisation on the long-term relationship. There are two main payment technologies. A transaction technology should theoretically have an interest rate elasticity α of ½ since its cash flows are constant over time, according to Baumol-Tobin (Baumol, 1952; Tobin, 1956). The interest rate elasticity α should be set at a lower value of ⅓ in accordance with Miller-Orr (Miller and Orr, 1966), which states that a transaction technology must capture random fluctuations in cash flows.

Keynesian Economics Theory

In the current turbulent era of global economic stagnation and crises, the theoretical advancements of Milton Friedman and John Maynard Keynes, the two greatest economists of the twentieth century, are highly relevant. In actuality, the economic policies that various nations pursue are heavily influenced by their respective developments.

Keynes' analysis in The General Theory of Employment, Interest and Money gave the impression that he believed inflation was a permanent solution to unemployment, even though he was right to advocate reflation as the best remedy for unemployment brought on by monetary deflation. If Keynes intended this to be a highly undesirable policy, economist Jacob Viner was one of the people who realised this. "In a world structured according to Keynes' specifications, there would be a constant race between the [money] printing press and the business agents of the trade unions, with the problem of unemployment largely solved if the printing press could maintain a constant lead and if only volume of employment, irrespective of quality, is considered important," Viner stated (1936, p.149).

Keynesian economics, according to many economists, is merely a prescription for inflation. However, the only way to support this conclusion is to disregard all of Keynes' writings subsequent to the General Theory. As soon as he completed that work, he began writing about the necessity of reversing the deficit-running policy as soon as the economy was growing steadily. Keynes stated that it was already time for the government to start reversing its deficit policy and starting to pay down debt in his underappreciated essay "How to Avoid a Slump," which was published in January 1937. It was necessary to start reducing stimulus even though the unemployment rate in Britain was still high at 12½ percent. He claimed that the boom "is the right time for austerity at the Treasury" (Keynes Writings, 21, 390).

Keynes reiterated his worry that inflation was beginning to show its ugly head in March 1937. He was concerned that the government would have to use price controls and rationing, which he strongly opposed, unless steps were taken to reduce nondefense spending in order to lower demand and free up industrial capacity for

rearmament. Price controls and rationing, which Keynes disapproved of as being ineffective and distorting, were the main ways the British government dealt with inflation during World War I.

He stated in The Economic Consequences of the Peace that "the preservation of a spurious value for the currency, by the force of law expressed in the regulation of prices, contains in itself…the seeds of final economic decay, and soon dries up the sources of ultimate supply." He clarified that when the nature of the issue was that demand outstripped supply of goods, price controls would be useless (Keynes, Writings, 21:404-409, 2:151, 22:43).

The challenge of controlling inflation became even more pressing when World War II broke out in Europe in September 1939. Increased demand for goods and services as well as a shift in production from meeting consumer demands to military requirements were inevitable outcomes of war.

Keynes thought that raising aggregate taxes was the most effective way to manage demand and keep inflation under control. However, there were two issues with this strategy. First, economic incentives were being negatively impacted by already high-income tax rates. The second was determining how to ensure that everyone, including those with low incomes, helped to finance the war effort and reduced their consumption during a time when consumer necessities were scarce. This goal might be accomplished by a sales tax, but Keynes believed that implementing a completely new tax at a time when the government bureaucracy was already under a lot of strain would be too challenging and time-consuming (Keynes, Writings, 22:44-46).

According to this viewpoint, lower interest rates can increase demand by lowering the cost of borrowing, which could result in higher inflation if the economy is close to or at capacity. Higher interest rates, on the other hand, might discourage investment and consumer spending, which would lessen inflationary pressures. Keynesian economics is a macroeconomic theory that supports government intervention to control aggregate demand and stabilise the economy, especially during recessions. It implies that while contractionary policies can be used to control inflation during economic downturns, higher government spending and lower taxes can boost demand.

RELATED LITERATURE

Existing approaches to test for a long-run link between money growth and inflation can be classified into three categories: a) studies testing QTM on a country-by-country basis (Juselius, 1999; Sargent & Surico, 2008; Assenmacher-Wesche & Gerlach, 2007; Benati, 2021; Amisano & Fagan, 2013), cross-section analyses (McCandless & Weber, 1995; Barro, 2007), and studies based on panel data, which exploit simultaneously the cross-section and the time series information contained in the data (De Grauwe & Polan, 2005; Teles et al., 2018; Gertler &Hofmann, 2018). Studies belonging to the first group sometimes use long runs of data and face difficulties arising from the incomparability of economic and financial systems across time.

Moreover, findings from single countries cannot be easily compared with those of other countries. Cross-sectional studies treat all countries the same and generally do not allow for regime changes in individual countries. Moreover, tests of the QTM based on scatterplots of inflation and money growth using country averages or long-run moving averages of time series could be flawed because cross-country differences in velocity and GDP are ignored. Some of these issues can be better addressed in panel approaches. However, an important assumption for the validity of panel regression techniques is cross-sectional independence and inter-cross-sectional homogeneity. Both issues may arise when testing QTM.

Do changes in interest rate increase or decrease inflation? The answer to this seemingly straightforward question is not obvious. The relationship between these two variables is disputed from a theoretical standpoint as well, even though it is difficult to determine the direction of causality empirically (Uribe, 2022; Crowder, 2020) for opposite results. According to the Fisher equation, higher nominal rates must inevitably translate into higher inflation once all temporary forces have subsided, even though most economists would likely contend that, in accordance with Keynesian doctrine, raising interest rates must result in lower inflation.

In its most basic form, the NK model consists of an IS, or intertemporal Euler equation, which captures the intertemporal behaviour of consumers; an aggregate supply equation, or Phillips curve, which captures the firm's pricing behaviour; and a monetary policy rule, which illustrates the actions of the central bank (CB), which is thought to be in charge of nominal interest rates. In its most basic form, this final equation is a linear relationship

between interest rates and inflation, whereby the CB raises nominal rates whenever inflation increases to keep price increases under control (Taylor, 1993).

The presence of multiple equilibria is a notable characteristic of such NK models when closed with rational expectations (RE). Multiple stable paths for output and inflation that are consistent with the model equations and the rationality of expectations requirement result from an interest rate peg, which is a Taylor rule that moves interest rates less than one to one with inflation.

There is little research examining how these effects differ across various economic sectors, even though previous studies frequently examine the overall impact of interest rate changes on inflation. For example, because of their distinct demand elasticity, industries like housing, consumer goods, and services may react to interest rate changes in different ways. A more sophisticated understanding of the relationship between monetary policy and inflation may be obtained by examining these disparate effects.

Short-term reactions to interest rate changes are the subject of a large portion of the literature currently in publication. Comprehensive studies looking at long-term effects on inflation are scarce, though. Using historical data from various economic cycles, research could examine how extended periods of low or high interest rates affect consumer behaviour and inflation expectations over time.

There is not enough research on how business and consumer expectations affect inflation in reaction to changes in interest rates. According to behavioural economics, expectations have a big influence on decisions about investments and spending, which in turn affects inflation.

Existing literature can be cited to support these research gaps Taylor, (1993) focused on discretion versus policy rules in practice" explores the effects of interest rate policies on inflation and other macroeconomic variables. Bernanke and Gertler, (1995) concentrated on inside the black box: The Credit Channel of Monetary Policy Transmission" examines the ways in which monetary policy influences economic results. While Mishkin (2007) dealt with Monetary Policy Strategy" offers information on the different tactics used by central banks and how they affect the management of inflation.

Examining these gaps not only advances scholarly discussion but also has real-world ramifications for decision-makers who want to use interest rate changes to effectively control inflation. Additionally, it can alert players in the financial markets to possible changes in the state of the economy brought on by adjustments to monetary policy. Despite the fact that a great deal of research has been done on the connection between interest rates and inflation in the United States, filling in these gaps can help us better understand this intricate interaction and enhance economic forecasting models.

METHODOLOGY

This study took a quantitative, descriptive approach using a time series regression design to examine how real interest rates have influenced inflation in the United States from 2000 to 2023. Annual data was collated from TheGlobalEconomy.com, which included inflation figures (as measured by the Consumer Price Index), real interest rates (adjusted using the GDP deflator), and a variety of macroeconomic control variables. These variables included capital investment, household consumption, unemployment, foreign direct investment, government spending, government debt, population growth, and health spending, all expressed as percentages of GDP or annual rates. To analyse the data, a multiple linear regression model using Ordinary Least Squares (OLS) was estimated in Stata. The model is as follows:

$$INF_t = \beta_0 + \beta_1 RIR_t + \beta_2 CI_t + \beta_3 HC_t + \beta_4 UNEMP_t + \beta_5 FDI_t + \beta_6 GS_t + \beta_7 GD_t + \beta_8 PG_t + \beta_9 HS_t + \varepsilon_t$$

Where;

INF_t is the inflation rate at time t

Diagnostic tests were also conducted to ensure the model's validity. The Breusch-Pagan/Cook-Weisberg test was used to check for heteroskedasticity, while Cameron and Trivedi's IM test looked for specification errors. The

Ramsey RESET test helped us evaluate any omitted variable bias, and we assessed multicollinearity using Variance Inflation Factors (VIFs), noting that a VIF above 10 could be a red flag. The dataset we used was entirely secondary and publicly available from The GlobalEconomy.com (https://www.theglobaleconomy.com/download-data.php), a widely used and credible database that aggregates economic indicators from international sources such as the World Bank, IMF, and national statistical agencies, so ethical clearance was required.

RESULTS

Impact of Interest Rates on Inflation in US

This analysis investigates the relationship between the real interest rate (RIR) and inflation (INF) in the United States, using a multiple linear regression framework. The model incorporates a comprehensive set of macroeconomic variables that may influence inflationary trends, including capital investment, household consumption, unemployment, foreign direct investment (FDI), government spending, government debt, population growth, and health spending. The goal is to determine the extent to which changes in real interest rates, while controlling for these other factors, explain variations in U.S. inflation.

Descriptive Statistics

The descriptive statistics indicate that inflation averaged 2.56% over the sample period, with a standard deviation of 1.66, and a range from –0.4% to 8%. Real interest rates averaged 2.66%, with moderate variation. Capital investment, household consumption, and government debt all showed low to moderate variability, while health spending and population growth were relatively stable. These statistics affirm the internal consistency of the dataset used in the model.

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Variable	Mean	Std. Dev.	Min	Max
inf	2.558333	1.664702	-.4	8
rir	2.658333	1.577509	-1.26	6.81
ci	21.33	1.440996	17.77	23.68
hc	67.5225	.5759931	66.02	68.58
unemp	5.764167	1.8425	3.63	9.63
fdi	1.720833	.6453372	.64	3.41
gs	14.90833	.8494738	13.84	16.81
gd	87.38208	24.3707	51.49	127.38
pg	.7608333	.2283003	.16	1.11
hs	15.69708	1.387546	12.49	18.76

Regression Diagnostics

To evaluate how reliable the model is, we ran a series of diagnostic tests.

Heteroskedasticity

The Breusch-Pagan/Cook-Weisberg test for heteroskedasticity reported a p-value of 0.0678, which suggests there is no strong evidence of heteroskedasticity.

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of inf

         chi2(1)      =     3.34
         Prob > chi2  =   0.0678
```

```
. estat imtest

Cameron & Trivedi's decomposition of IM-test
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Source	chi2	df	p
Heteroskedasticity	24.00	23	0.4038
Skewness	13.28	9	0.1502
Kurtosis	0.00	1	0.9885
Total	37.28	33	0.2785

Further, the Cameron and Trivedi's IM-test did not show any significant misspecification issues, with a total p-value of 0.2785. This indicates that the model is not facing serious problems related to heteroskedasticity, skewness, or kurtosis.

Multicollinearity

We also looked at the variance inflation factor (VIF) values to check for multicollinearity. The average VIF came out to be 8.03, with individual VIFs ranging from 1.37 to 14.62. It is worth noting that unemployment, government debt, and government spending had relatively high VIFs (over 9), pointing to a moderate to high level of multicollinearity that could inflate standard errors. This is however not enough to discredit the model, since the model's mean or overall VIF is still within an acceptable range.

```
. estat vif
```

Variable	VIF	1/VIF
unemp	14.62	0.068379
gd	10.30	0.097091
gs	9.56	0.104575
pg	8.25	0.121234
ci	7.74	0.129281
hc	7.53	0.132822
hs	7.33	0.136396
rir	5.59	0.178754
fdi	1.37	0.728478
Mean VIF	8.03	

Regression Results

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. . regress inf rir ci hc unemp fdi gs gd pg hs
```

Source	SS	df	MS		
Model	51.271999	9	5.69688878	Number of obs	= 24
Residual	12.4663337	14	.890452407	F(9, 14)	= 6.40
				Prob > F	= 0.0012
Total	63.7383327	23	2.77123186	R-squared	= 0.8044
				Adj R-squared	= 0.6787
				Root MSE	= .94364

inf	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
rir	.770217	.2950133	2.61	0.021	.1374764	1.402958
ci	1.912068	.379762	5.03	0.000	1.09756	2.726577
hc	3.709977	.9373243	3.96	0.001	1.699616	5.720338
unemp	.9965181	.4083874	2.44	0.029	.1206141	1.872422
fdi	-.3113547	.3572288	-0.87	0.398	-1.077534	.4548248
gs	-.7730454	.7162715	-1.08	0.299	-2.309295	.7632041
gd	.06332	.025911	2.44	0.028	.0077465	.1188935
pg	-3.410405	2.47527	-1.38	0.190	-8.719331	1.898521
hs	-1.018266	.3839659	-2.65	0.019	-1.841791	-.194741
_cons	-271.4185	62.98546	-4.31	0.001	-406.5088	-136.3281

The main focus here is the real interest rate (RIR), which has a positive and statistically significant coefficient of 0.770 ($p = 0.021$). This finding implies that, when we account for other factors, a one-unit rise in the real interest rate correlates with a 0.77 unit increase in the inflation rate. While this might seem a bit surprising according to traditional macroeconomic theory, where higher interest rates are usually thought to curb inflation, this result could be influenced by various complex delays, the way policies are transmitted, or inflation expectations that this model doesn't fully capture.

Additionally, several other variables show significant effects. Capital investment (CI) has a notably strong positive link to inflation, with a coefficient of 1.91 ($p < 0.001$), suggesting that more investment activity tends to drive inflation up. Household consumption (HC) also has a significant and substantial positive impact (3.71, $p = 0.001$), indicating that increased consumer demand plays a key role in pushing prices higher. Likewise, unemployment (UNEMP) is positively related to inflation (0.997, $p = 0.029$), which might point to unusual labor market trends or ongoing structural inflationary pressures.

When we look at health spending (HS), it turns out there is a significant negative relationship with inflation (–1.02, $p = 0.019$). This suggests that when we spend more on health, it might actually help keep overall prices in check, possibly by shifting funds away from sectors that are more sensitive to inflation. On the other hand, government debt (GD) shows a small but noteworthy positive impact on inflation (0.063, $p = 0.028$). This indicates that higher levels of debt could be pushing prices up, likely because people expect future government spending to increase. Other factors like foreign direct investment (FDI), government spending (GS), and population growth (PG) did not show any significant statistical impact in this model, even though their trends align with what we'd expect theoretically. Interestingly, population growth has a large negative coefficient (–3.41), but with a p-value of 0.190, hinting that it might be important enough to explore further with a bigger sample size.

DISCUSSION

Multiple studies using US data find a significant negative correlation between real interest rates and expected inflation, contradicting the Fisher hypothesis (which predicts no correlation) and supporting alternative theories that higher inflation is often associated with lower real interest rates (Pennacchi, 1991; Sarig et al., 1996). Sarig et al. (1996) tested the Fisher hypothesis that the real rate of interest is independent of inflation expectations. They found real interest rates have a negative correlation with expected inflation, contradicting the Fisher hypothesis and supporting theories of Mundell, Tobin, Darby, Feldstein, and Stulz. Analysis of US savers' expectations also shows that most expect zero or negative real interest rates when inflation is high, further supporting the negative association (Haines, 1986). Pennacchi (1991) found that over the period 1968-88 real interest rates and expected inflation are significantly negatively correlated, with real interest rates showing greater volatility and weaker mean reversion than expected inflation.

The results are consistent with earlier research showing intricate connections between real interest rates and anticipated inflation, pointing to the need for sophisticated economic models that better represent these dynamics than conventional frameworks (Pennacchi, 1991; Sarig et al., 1996). Therefore, in order to effectively inform scholarly discourse and the formulation of practical policy, future research should focus on creating strong econometric models that can account for these complex relationships.

CONCLUSIONS

The study based on the empirical findings draws conclusion that the dataset shows internal consistency and reliability in its conclusions about how inflation and other economic indicators interact, but it also reveals complexities that should be carefully considered by policymakers and economists alike when navigating future economic landscapes.

The conclusion is that conventional macroeconomic theories, which generally imply that higher interest rates suppress inflation, are challenged by the positive correlation between real interest rates and inflation (coefficient

of 0.770, p = 0.021). This finding suggests that this relationship may be influenced by additional factors, including investment behaviours and consumer expectations.

Additionally, the study finds that household consumption (3.71, p = 0.001) and capital investment (1.91, p < 0.001) have significant positive effects, highlighting their roles as the main causes of inflation. Prices tend to rise when demand in these areas increases, suggesting that policymakers should take these factors into account when developing economic strategies.

Furthermore, the negative correlation between inflation and health spending (–1.02, p = 0.019) implies that higher health spending could stabilise prices by diverting funds from more inflation-sensitive industries. Additionally, even though government debt has a slight positive impact on inflation (0.063, p = 0.028), more research is necessary to determine how inflationary pressures may be impacted by expectations of future government spending.

Although the average VIF of 8.03 suggests caution when interpreting individual coefficients, it does not invalidate the model because it shows some degree of multicollinearity among variables such as government spending and unemployment.

RECOMMENDATIONS

The study provides the following recommendations based on its findings. It is recommended that policymakers should review monetary policy frameworks to take into account consumer expectations and behavioural reactions to interest rate changes in light of the surprising positive correlation between real interest rates and inflation.

It is further recommended that to boost economic growth without escalating inflationary pressures, government should promote capital investment through tax breaks or subsidies.

Another area government of the United States should pay attention, is to examine methods for strategically raising health spending to reduce inflation and enhance public health results. The study suggests that government of the United States should adopt measures to responsibly manage the amount of government debt while taking into account how they might affect inflation expectations.

It is suggested that government agencies such as the central bank of the United States, US Department of the Treasury, Bureau of Economic Analysis, and Consumer Financial Protection Bureau should increase public awareness of how macroeconomic variables, like consumption and interest rates, impact individual financial choices, especially when inflation is erratic. The study also recommends that further research should be done to examine the relationships between inflation and population growth as well as the underlying reasons for the multicollinearity among important economic indicators that has been observed.

LIMITATIONS / FUTURE RESEARCH

The present sample contains only 22 annual observations; more sophisticated penalised or time-varying estimators would be under-powered and risk over-fitting. We therefore retain the current OLS specification but now explicitly discuss these issues below. Future work with higher-frequency or longer-span data can explore Ridge/LASSO shrinkage, structural-VAR identification, or threshold models to disentangle simultaneity and non-linearities.

The set of macroeconomic controls exhibits non-negligible collinearity (mean VIF ≈ 8, max ≈ 14.6);. At the same time, coefficients remain stable and the key real-interest-rate variable retains significance, the precision of individual control estimates is unavoidably reduced. Likewise, annual data cannot resolve the timing of monetary-policy pass-through or the formation of inflation expectations. We therefore leave deeper investigation of these dynamic and non-linear channels using penalised regressions, instrumental-variable techniques, or high-frequency identification to studies that enjoy larger or richer data structures

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