

Abstract ID: ICBMIS-2019-017

The Us Dilemma: Inflation Rate and The Us Economic Growth

Maimunah Ali¹, Ganama Moustapha Gueme², Siti Aisyah Mustafa³

¹ Department of Business Management, Universiti Tun Hussein Onn Malaysia
maimunah@uthm.edu.my

² Department of Business Management, Universiti Tun Hussein Onn Malaysia
ganamamoustapha@gmail.com

³ Department of Business Management, Universiti Tun Hussein Onn Malaysia 3
aisyahm@uthm.edu.my

Abstract

Economic growth is a considerable key factor of development of a nation's economic conditions, often proxied by the GDP growth. The US dilemma in confronting the trade war with China would affect its inflation rate via higher tariff on imported goods into the US. Given this current situation, an evaluation of knowing the nexus between inflation and US economic growth is indeed timely. Hence, this study aims to examine the relationship between inflation rate and the US economic growth. An ARDL model is employed to investigate their relationship using data derived from several sources including the US Bureau of Labor Statistics, World Bank Development Indicators (WDI), and the Organization for Economic Cooperation and Development (OECD) from the period spanning 1970 to 2017. The results found that, in the long run, inflation has a significantly negative effect on the US economic growth. On the other hand, the results of the short run analysis are estimated using the error correction model indicated that inflation rate has a significant effect on the US economic growth.

Keywords: inflation, GDP growth, ARDL

1 Introduction

Monetary economics has always been among the most successful research areas within macroeconomics over the past decade (Galí, 2007). Economic growth is one of the most significant indicators of a strong economy (Well, 2007; OECD, 2007) and, it is measured by the increase of a country's total output (Economist, 2017). Some parts of the world, like the United States or Western Europe, experienced sustained economic growth over a period of more than 100 years, so by historical standards these countries are now enormously wealthy. This is not only true in absolute terms (i.e. GDP), but also the measure of wealth as income per capita (Howitt and Weil, 2012). As gross domestic product (GDP) is representing the market value of all final goods and services produced by a country within a given time, it is widely used to measure economic growth.

Inflation, on the other hand, refers to rise in the general prices level of goods and services in an economy over a period of time. When the general price level rises, each unit of currency buys fewer goods and services. Consequently, inflation also reflects erosion in the purchasing power of money because of the loss of real value in the internal medium of exchange and unit

of account within the economy (Bortis, 2004). Inflation's effects on an economy are various and can be simultaneously positive and negative. Negative effects of inflation include an increase in the opportunity cost of holding money, uncertainty over future inflation which may discourage investment and savings, and if inflation is rapid enough, shortages of goods as consumer begin hoarding out of concern that prices will increase in future. Positive effects include ensuring that central banks can adjust real interest rates, and encouraging investment in non-monetary capital projects (McCallum, 1987). Mallett and Keen (2012) pointed out that inflation is one of the most important problems in economics (Kateřina et al., 2017).

The United States particularly, has experienced almost continuous inflation since the end of World War II (Labonte and Makinen, 2008). Furthermore, its recent pursue on threatening trade wars on countries especially China, would further escalate the US inflation rate higher as trade war would mean higher tariff on goods into the country. As import inflation is looming, the issue remains whether should the US continues on the war path on trade and tariff knowing the effects on its economic indicators and thus, its economic growth. As far as the monetary side is concerned, the Federal Reserve has undertaken economic limitation with both traditional and unconventional policies as the home of free-market economic policies (Engen et al., 2015). Ever since after the great recession, the Federal Reserve has been very active and committed to maintain the interest rates that were originally supposed to be kept low merely until the inflation exceeded 2.5% (Brotten and Collins, 2017).

Although the US stock market has been bullish lately in June, the stock market comeback has little to do with economic fundamentals, but its comeback was largely driven by the shift in the Federal Reserve's monetary policy. Last year alone, the FOMC (Federal Open Market Committee) had raised the fed funds rate 4 times – 1.75% (March), 2.0% (June), 2.25% (September) and 2.5% in December. The 2008 recession triggered by sub-prime crisis caused the Fed to lower its benchmark rate to 0.25% – that's effectively zero percent. And it had stayed there 7 years until December 2015, when the Fed raised interest rates to 0.5% for the first time. In total, since the 2015's hike, the Fed has raised rates 9 times. In fact, in Dec 2018, the Fed projected **2 more rate increases** in 2019. There are two main reasons for the increase - **weakening economy** and growing political pressure from the Trump administration (Financial Times). Indeed, the stock markets appear to be dancing to the tune of the US-China trade war, as can be seen in the latest waiting game of this week's G-20 Summit in Japan. The latest verdict, The US president dropped a bombshell when he declared an additional 10% tariff would be imposed on Chinese imports to the U.S. – effective September 1 2019. All three major U.S. stock indices that were enjoying the earlier session with bullish buying suddenly took massive U-turns, selling as quickly as they could, as if it was the end of the world. The Dow Jones Industrial Average (DJIA) closed 280.85 points lower at 26,583.42. Between the gain of 311 points and 290 points in negative territory, that's about **591 points** of loss in a single day. After extensive trade talks with China ended without an agreement on May 10, 2019, President Trump hiked the tariffs on another US\$200 billion in Chinese imports from 10% to 25%. China retaliated 3 days later, announcing new tariffs on US\$60 billion of American exports. Trump's latest tariff would mean that **all Chinese goods** entering the U.S. will be subjected to taxes.

However, Gary Shilling, the economist known for correctly predicting bubbles like the sub-prime of 2008, claimed that America is **already in recession**. He said in an interview early July – “I think we're probably already in a recession, but I think it will probably be a run-of-the-mill affair, which means real GDP would decline 1.5% to 2%, not the 3.5% to 4% you had in the very serious recessions” (www.dailymail.co.uk). Shilling offers reasons for an economic **pullback** – heavy corporate borrowing, a strong dollar that's pinching emerging

markets, weak housing data and declining industrial production due to trade wars. The pressing issue is this, is the U.S. economy is doing great in spite of the trade war with China? In the present trade war climate, would the US economy remains unaffected?

2 Literature review

Inflation has been intrinsically linked to money, as captured by the often heard maxim states that inflation is too much money chasing too few goods. Anyanwu (1993) defines inflation as a state of affairs in which there is excess demand for commodities in the economy as a whole. This suggests, the level of spending being concentrated towards home produced goods, which can be attainable in the long-run, giving existing productive resources. Inflation rate is measured as the percentage change in the price index (consumer price index, wholesale price index, producer price index etc). Essien (2002) opines that the consumer price index (CPI), for instance, measures the price of a representative basket of goods and services purchased by the average consumer and calculated on the basis of periodic survey of consumer prices. Owing to the different weights of the consumer basket, changes in the price of some goods and services have impact on measured inflation with varying degrees.

Several economics theories have been developed to explain the phenomenon of inflation using various schools of thought. The Classical school of thought put forward the Quantity Theory of Money to explain that changes in the general level of prices are determined primarily by changes in the quantity of money in circulation. The quantity theory of money formed the central core of 19th century classical monetary analysis, provided the dominant conceptual framework for interpret in contemporary financial events and formed the intellectual foundation of orthodox policy prescription designed to preserve the gold standard. David Hume (1711-76) provided the first dynamic process analysis of how the impact of a monetary change spread from one sector of the economy to another, altering relative price and quantity in the process. He provides considerable refinement, elaboration and extension to the Quantity Theory of Money. The most famous equation of the Quantity Theory of Money was developed by Irving Fisher quoted as $MV = PT$, where M is money supply, V is velocity of circulation, P is price level and T is transaction or output. The monetary effect on inflation was further supported by the Neo-Classical school of thought (known as the monetarist) led by Prof. Milton Friedman, who hold that “only money matters”, and as such monetary policy is a more potent instrument than fiscal policy in economic stabilization. According to the monetarists, the money supply is the “dominate, though not exclusive” determinant of both the level of output and prices in the short run, and of the level of prices in the long run (Case and Fair, 2014)

The Keynesian school of thought (established by John Maynard Keynes 1883 – 1946) on the other hand emphasizes the increase in aggregate demand as the source of demand-pull inflation. The aggregate demand comprises consumption, investment and government expenditure. When the value of aggregate demand exceeds the value of aggregate supply at the full employment level, the inflationary gap arises. The larger the gap between aggregate demand and aggregate supply, the more rapid is the inflation (Parkin, 2014). According to demand-pull inflation theory of Keynes, policy that causes decrease in each component of total demand is effective in reduction of pressure demand and inflation. One of the reductions in government expenditure is tax increase and to control volume of money alone or together, can be effective in reducing effective demand and inflation control. In difficult conditions however, e.g. hyperinflation during war, control of volume of money or decrease in general expenditure may not be practical if the increase in tax go against the direct action for control on demand (Keynes, 1936).

The concept of structural inflation entered into economics discussion and research about 40 years ago (Totonchi, 2011). It is related to the effect of structural factors on inflation, whereby structural analysis is conducted to recognise how economic phenomenon such as inflation, forms lawful relationships with other economics phenomena. According to this school of thought, inflation is the result of the structural changes in society and country. When a country transforms its economic situation and undergoes structural changes to achieve economic growth, inflation occurs as a result of structural improvement. Therefore, any government intervention in the market structure or common anti-inflation measures would only stop the economy from growing, thus would cause the economy to shrink (Harrison, 1994). Among factors that contributed to structural changes are population growth, immigration and intense competition among producers. According to this viewpoint, inflation is the manifestation of the development of the economy and society depicted by the rapid growth of the economy (McCallum, 1987).

Umar et al. (2012) stated economic growth as a considerable key factor of development of a nation's GDP and can be characterized by its GDP growth. Alongside other significant measures, gross domestic product (GDP) is the most common factor affecting economic growth as it reflects the value of all final goods services lawfully produced within a given economy in a specific time period (Castells, 2017). Moreover, it is the most commonly used measure of the economic activity of a country.

Issues regarding the impact of inflation on growth, productivity and output have been extensively debated in the field of macroeconomics. Theoretical models in the money and growth literature analyse the impact of inflation on growth focusing on the effects of inflation on the steady state equilibrium of capital per capita and output (Orphanides and Solow, 1990).

Inflation affects the growth of the economy in many ways, its burden has been shifted on retired people whose income is fixed. For example, when prices for goods and services increases, these pensioners would not get the same amount of goods they could buy previously. This discourages savings and reduces economic growth because the economy needs a certain level of savings to finance investment which boosts economy growth. Besides its burden on investment makes it to plan for what to produce, where to produce and for whom to produce in future because business cannot predict the demand for their product due to the higher prices they will have to charge so as to cover their cost. It also causes uncertainty about future prices, interest rate, and exchange rates, and this in turn increases the risks among potential trade partners as well as discourages trade. The effect of inflation on investment occurs directly and indirectly. It increases transaction and information which directly inhibits economic development. For instance, when inflation makes nominal value uncertain, investment planning becomes difficult. Individual may be reluctant to enter into contracts when inflation cannot be predicted making relative prices uncertain. This reluctance to enter into contracts over time will inhibit investment which will affect economic growth. In this case inflation will inhibit investment and could result in financial recession (Case and Fair, 2014).

Sustained inflation is damaging to long-run growth and the financial system in general. Increase in inflation lead to lower real returns not just on money, but on all other assets too. These low returns interfere with the functioning of financial markets and the allocation of investment. Low real returns have the effect of severely damaging the credit market. As a result, higher inflation contracts the supply of credit available to fund capital investment damaging the economy (Blume, 1978). This implies that inflation affects investment in sev-

eral ways mostly inhibiting economic growth. The source of inflation is money and the supply of it. Investors need to be able to expect returns in order for them to make financial decisions. If people cannot trust money, then they are less likely to engage in business relationship. This results in lower investment, production and loss socially positive interactions. Among other effects, people may start to attempt to trade by other less efficient, means in order to avoid the unpredictable price levels due to inflation.

3 Research Methodology

This study adopts quantitative approach and causal relationship to examine the effect of the US inflation on its economic growth. The sample of this study are the United States data on inflation and economic growth from 1970 to 2017. The anticipated analysis tools which are employed in this study is to examine the selected variables: inflation as the independent variable, and the GDP growth as the dependent variable. In regards to address the hypotheses for the empirical analysis, ordinary least square (OLS) regression model and autoregressive distributed lag (ARDL) are employed for the purpose of measurement of the behavior of the selected variables and the lag determination since the study is dealing with multiple linear regression.

3.1 Conceptual Framework

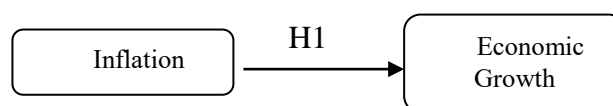


Figure 1: Conceptual framework

The above Figure1 summarizes the conceptual framework with both dependent and independent variables and their relationship on the economic growth.

3.2 Hypothesis Development

Ruzima (2016) suggested based on research conducted to investigate the effect of inflation on economic growth for 32 selected Asian countries over the period of 1980. The result show that inflation has a positive effect on economic growth and the relationship is significant. Another study conducted in Pakistan using a sample over the period 1971 to 2011 come up with similar outcome and the relationship is positive (Vinayagathan 2013). Similarly, a number of studies conducted support this hypothesis. For example, Ahmad et al., (2012) over the period 2000 and 2009 in Pakistan, and Fakhri (2011) stipulated that the target of 13% inflation shows a positive effect on economic growth in Azerbaijan with significant positive relationship. Nevertheless, the effect and relationship become negative when inflation exceeds 13%, especially when the rate of inflation is below (or above) the target level varying from one country to another. Dingela et al. (2017) established the existence of a relationship between inflation and economic growth in both short run and long run. Similarly, Hossain et al. (2017) found that an increase in inflation rate, due to a monetary expansion is significantly correlated with economic growth. Therefore, we posit that:

H1: Inflation rate has a significant effect on the economic growth.

3.3 Population and sample

The population of this study is based on time series data extracted from different sources from the year 1970 to 2017. The data are collected and analyzed by using “Econometric

Views” version students lite 10.0 and SPSS 20.0. In this research, the unit of analysis was inspired from the data that are collected in order investigate the influence of the selected independent variables on economic growth across the US which is inflation rate and one dependent variable referred as the real GDP growth rate. The sample data of inflation rate are ranging from year 1970-2017 extracted from the Organization for Economic Co-operation and Development (OECD). While GDP growth data is extracted from the World Development Indicators (WDI).

3.4 Model Specification and the ARDL Procedure

The initial equation below shows an interpretation of the multiple regression model with the inclusion of the variables employed into the analysis proposed by (Gujarati and Porter, 1999). The function form of the baseline model:

$$\text{Ec growth}_t = \alpha + \beta \text{ Inflation}_t$$

Using the lag, the new equation using the ARDL will be:

$$\text{Log Ec growth} = \alpha + \beta \text{ Log Inflation}$$

The ADF test is used to check the stationarity stage in order to reduce the variation by the first-differences of all the variables and obtains more accurate result due to the inclusion of lags that depend on the Akaike Information Criterion (AIC) (Dickey and Fuller, 1979 and 1981).

$$\Delta y_t = \alpha + \beta_1 t + \beta_2 t^2 + \gamma y_{t-1} + \phi_1 \Delta y_{t-1} + \dots + \phi_{p-1} \Delta y_{t-p+1} + \varepsilon_t \quad (3)$$

Regression and correlation analysis are conducted to allow the identification and relationship between the independent and dependent variables

4 Results/Findings

4.1 Trend Analysis

Figure 2 illustrates the trend analysis from the variables used where GDPG is the dependent variable; and inflation is the independent variable. The graph indicates there was economic recession starting from the end of 1973 to 1975 during the second half of the 20th century due to the Vietnam War which prolonged further leading to one of the bleakest periods of the US.



Figure 2: US GDP Growth, Inflation, long term Interest Rate, Unemployment (1970-2017)

Between these periods, the country has experienced a full scale energy crisis due to dramatic increase in oil prices from \$3 per barrel to until \$12 to \$150 per barrel anticipated by shortages; decreasing purchasing power, which simultaneously raised the rate of inflation from 5.7 to 9.1 %. Later, the economic growth has boom up in 1977 to 1980 before going back to recession in from 1981 to 1982 affecting the GDP Growth to drop by 2.9 % (Federal Reserve, 2017). In addition, in 2009, 9.3 % which affected the economic growth to be the lowest between this range (1970-2017) though the long term interest rate was lower averaged 5.72 % from 1971 until 2018, reaching an all-time high of 20 % in the early 1980. It is important to note that the period of 1990s was described by a strong economic growth leading to steady state in of low inflation rate due to rapid technological changes and moderate monetary policy (US Bureau of Economic Analysis). Furthermore, there is an argument that the 2 % target has been achieved in 2018 is the optimum level at which the economy is running at steady state growth level (FOMC, 2018).

4.2 Unit Root Test

The results of the unit root test show that all the variables are stationary after the first difference, which means all the indicators are integrated of order 1, I (1).

Table 1

Unit root test: Augmented Dickey-Fuller

Variable	ADF	Stationary status
lnInflation	-3.008131	I(1)
lnGDP	-3.370124	I(1)

4.3 Determination of Lags

The result of the lag selection is shown is the Table 2 below.

Table 2

The Number of Lag Length Determination

Variables	Coefficient	Std. Error	t-Statistic	Probability
GDPG(-2)	0.126386	0.148431	0.851484	0.3998
INF(-1)	-0.131845	0.069314	-1.902156	0.0648
C	3.264153	0.984710	3.314838	0.0020

Table 2 represents the lag length selection using Akaike information criterion (AIC) and Schwarz information criterion (SIC). The smallest values based on AIC is 2.977903 and the ARDL method from the lag selected is (1, 0, 2, 0). Therefore, the maximum number of lags used in this analysis is two lags and inflation rate has a statistically significant relationship at 1% and 5% levels with the economic growth in the US.

Table 3

Model Fit and Prediction Test

Item	Value	Test	Value
R-squared	0.797656	Mean dependent var	2.798279
Adjusted R- Squared	0.765707	Akaike info criterion	2.977903
Sum squared resid	37.92375	Schwarz criterion	3.258940
Prob (F-statistic)	0.000000	Hannan-Quinn criter.	3.082671

Table 3 shows the model fit and prediction value fitness. Interestingly, the value of R-Square (R^2) (79.7656%) and adjusted R Square (R^2) (76.5707%) respectively suggest a good

model. The result also shows that there is a long run relationship between inflation and economic growth in the US. Hence, the estimated coefficients are negative for economic growth (from GDPG) growth and inflation. Bound test is carried out to determine the existence of long run association relationship between the variables by comparing the value of F-statistic with the critical

Table 4

The Critical Value Bounds for F-statistic 10.35550 (k=3, n=45)

Case 3 (No intercept no trend)		
S. level	I(0)	I(1)
10%	2.72	3.77
5%	3.23	4.35
1%	4.29	5.61

Source: Adopted from Pesaran (2001)

The dependent variables from the results are unrestricted constant and no trend. $F=10.35550 > I(1)= 3.77$, there is a long run relationship between the variables thus the existence of long run relationship and co integration.

4.5 Long-Run Estimation

The results of long run relationship are shown in the Table 5 below.

Table 5

Estimated Long Run Coefficients using the ARDL Approach for Model 1 ARDL (1, 0, 2, 0) selected based on AIC Criterion, Dependent Variable is GDPG.

Regressors	coefficient	Standard Error	T-statistic	Probability
GDPG(-2)	0.126386	0.148431	0.851484	0.3998
INF(-1)	-0.131845	0.069314	-1.902156	0.0648
C	3.264153	0.984710	3.314838	0.0020

The estimated coefficients of the long run relationship (for p value <5%) shows that INF (inflation) is significant and has a negative relationship with economic growth. This implies that inflation has a negative effect on economic growth and has negatively significant relationship with economic growth at 5% level of significance. The long run model corresponding to ARDL (1, 0, 2, 0) for the relationship between economic growth and inflation, and other explanatory variables referred as the co-integration equation can be written as:

$$\text{Log ec growth} = 3.264153 - 0.131845 * \text{Log INF} \quad (4)$$

4.5.1 Error Correction Model (ECM) Estimates for Model 1 or Short Run Estimation

Once the long run association relationship established, the next step is to determine the error correction model for the selected ARDL model estimated in Table 6 below present the results of the estimated ECM corresponding to the long run estimates for Model 1.

Table 6:

Error Correction Representation for the Selected ARDL Model for Model 1 ARDL (1,0,2,0) selected based on AIC Criterion, Dependent variable is $\Delta GDPG$

Regressors	Coefficient	Standard Error	t-Ratio	Prob.
C	-0.124976	0.276793	-0.451514	0.6542
D(GDPG(-1))	-0.026476	0.163776	-0.161657	0.8724
D(INF(-1))	-0.489362	0.213295	-2.294301	0.0274
ECM(-1)	-0.493131	0.300733	-1.639762	0.1093

The error correction model ECM (-1) is negative and significant at 1%. This confirms the existence of a long term relationship between inflation and economic growth and the inflation in the United States. The value for the estimated coefficient of ECM_{t-1} is -0.493131 and the lag of inflation rate which is significant in the short run model with p -value of $0.0274 < 0.05$ level of significance. The disequilibrium between the variables in the previous year is getting adjusted at the speed of only approximately 49% towards the long run equilibrium in the current year. Which shows the rate of adjustment in the process is rather low. Therefore, the error correction model equation becomes:

$$\Delta \text{Log ec growth} = -0.124976 - 0.489362 \cdot \Delta \text{LINft} - 0.493131 \cdot \text{ECM} \quad (5)$$

4.4 Diagnostic Tests

A number of diagnostic tests were conducted to determine the suitability of the ARDL model in this study in order to determine the relationship between economic growth and the inflation in Table 7 below.

Table 7:

Diagnostic Tests' Result

	Test Statistics	
A: Serial Correlation	LM test	0.525967 [0.5957]
B: Functional Form	Ramsey RESET test	0.922027 [0.4072]
C: Normality	Jarque-Bera test	6.413852 [0.6010]
D: Heteroscedasticity	ARCH test	1.593039 [0.1604]

There is no problem of serial correlation as the p value of both the dependent and independent variable is significant greater than 5. Then the model does not have a problem of serial correlation either. No heteroscedasticity and functional form misspecification.

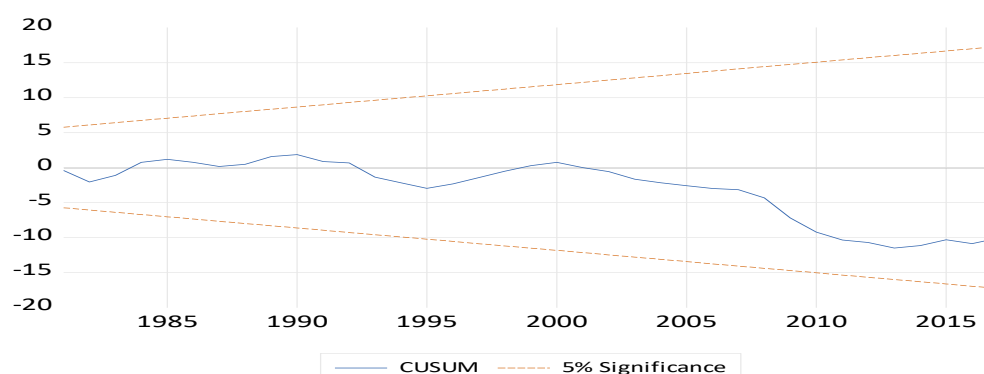


Figure 3: Plot of Cumulative Sum of Recursive Residuals (CUSUM)

CUSUM and CUSUMSQ plot display a blue line between the two red lines significant at 5 % level indicating that the model is stable.

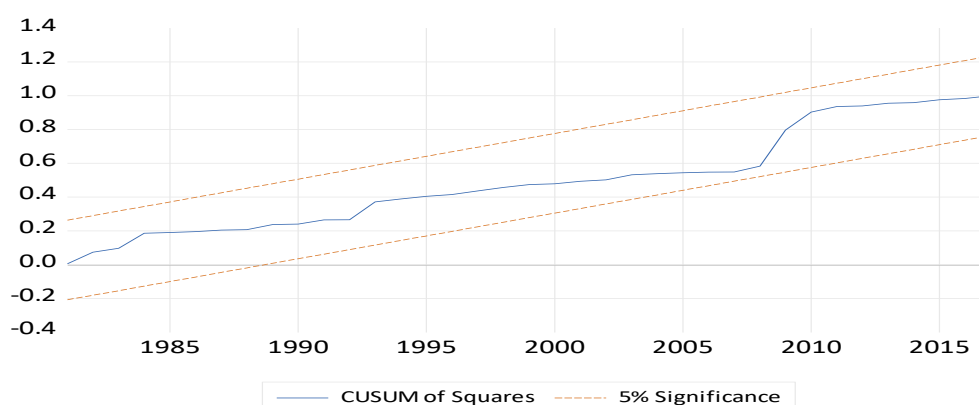


Figure 4: Plot of Cumulative Sum of Square Recursive Residuals (CUSUMSQ)

After the stability test is known, next, long run estimation and the error correction model from the residual series will be determined.

4.6 Hypothesis Testing

The first hypothesis of the result unexpectedly shows that inflation has negative effect on economic growth in the US. The last hypothesis indicates that the p-value (Sig.) is less than 0.05, so the correlation coefficient is statistically significant at $\alpha = 0.05$. It can be concluded there is a significant relationship between inflation and the US economic growth.

5 Discussion and conclusion

The main aim of the study is to investigate the effects of inflation on the economic growth in the United States. The study has employed the Autoregressive Distributed Lag (ARDL) modeling approach proposed by Pesaran and Shin (1995 and 1997) to estimate both the short and long run elasticities of the selected macroeconomics variables. The results of the bound test show that, there is a long run relationship between inflation and economic growth. A number of diagnostic tests include LM test to check for the presence of serial correlation in the model, functional form test, Jarque-Bera test for normality and ARCH test for heteroscedasticity. Ramsey's RESET test shows there no functional form misspecification, no heteroscedasticity and the residual squared are well fitted and the error term is normally distributed due to probability value greater than 0.05. Moreover, the results from CUSUM and CUSUMSQ in figures 4.2 and 4.3 show that that the model is stable.

RO 1: To Determine the effect of Inflation Rate on Economic Growth

The first objective shows that INF is significantly negative and has a negative relationship with economic growth. Similarly, this result is in line with the study conducted by Barro (2013) concluded that the estimated effects on inflation on economic growth for selected 100 countries over the period of 1960 to 1990 is found to be significantly negative. The inflation average raise by 10 % points per year it will also lower the growth rate by 0.2 to 0.3 % of real GDP per capita points per year. Svigir and Milos (2017) investigated the relationship between inflation and economic growth in Austria and Italy over the period of 1980- 2016. Where the results of the statistical and econometric comparative analysis suggest that lowering the inflation level is important but not sufficient factor for economic growth. However, relationship

may be negative, positive, and neutral and Babalola (2015) concluded inflation rate is not granger cause to economic growth.

Conversely, another finding by Sattarov (2011) in Finland (over the period 1980-2010) are found to be contradicting the findings of this study. The results indicated there is a positive relationship between inflation and economic growth in the long run. An important aspect of this finding suggested that when the rate of inflation is above 4 %, this will start to significantly lower the economic growth rate in Finland. For the US for example, Powell (2018) has confirmed that low inflation has positive effect on economic growth and the 2 % target in the long run will continuously be proved to be significant to the growth and low unemployment level.

5.1 Conclusion

In line with the objective of this study, the result in the long run showed that there is a significant negative effect of inflation on economic growth in the US. Shilling could be correct in his prediction of the US recession. The signs are already showing, for instance, sales of new U.S. homes slumped 7.8% in May, as sales plunged in the pricier North-eastern and Western markets caused by lack of Chinese investors.

Acknowledgements

This work is partially supported by the Business Management Department of the Universiti Tun Hussein Onn Malaysia. The author(s) also gratefully acknowledge the helpful comments and suggestions of the reviewers, which have improved the quality of this paper.

References

- Acharya, A. (2018). *The end of American world order*.
- Ahmad, N., & Joyia, U. T. S. (2012). The relationship between inflation and economic growth in Pakistan: An econometric approach. *Asian Journal of research in business economics and management*, 2(9), 38-48.
- Al-saadi, Hashil. 2014. "Demystifying Ontology and Epistemology in Research Methods." (February):1-11.
- Babalola, O. O., Danladi, J. D., Akomolafe, K. J., & Ajiboye, O. P. Babalola (2015). Inflation, interest rates and economic growth in Nigeria. *European Journal of Business and Management*, 7(30), 91-102.
- Baldwin, R. (2016). The great convergence. *Harvard University Press*.
- Barrow, C. (2018). More than a historian: the political and economic thought of Charles A. Beard. *Routledge*.
- Barro, R. J. (2013). Inflation and economic growth. *Annals of Economics & Finance*, 14(1).
- Beckmann, J., Belke, A., & Dreger, C. (2017). The relevance of international spillovers and asymmetric effects in the Taylor rule. *The Quarterly Review of Economics and Finance*, 64, 162-170.
- Blanchard, O. J., & Summers, L. H. (2017). *Rethinking Stabilization Policy: Evolution or Revolution?* (No. w24179). National Bureau of Economic Research.
- Bullard, J. (2017). Current Growth , Inflation and Price Level Developments in the U . S ., 1-33.
- Bureau of Economic Analysis. (n.d.). Measuring the Nation's Economy: Aguide to the Bureau of Economic Analysis. Retrieved from
- Broten, N., & Collins, J. (2017). The Role of Monetary Policy. *CRC Press*.

- Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for testing the constancy of regression relationships over time. *Journal of the Royal Statistical Society. Series B (Methodological)*, 149-192.
- Clayton, B. C. (2015). *Commodity markets and the global economy*. Cambridge University Press.
- Conti-Brown, P. (2015). The twelve Federal Reserve banks: Governance and accountability in the 21st century. *Hutchins Center Working Papers*.
- Cúrdia, V., & Woodford, M. (2016). Credit frictions and optimal monetary policy. *Journal of Monetary Economics*, 84, 30-65.
- Deloitte, (2016). Global Economic Outlook. *Deloitte University Press*, (049), 1–11.
- Dingela, S., & Khobai, H. (2017). Dynamic Impact of Money Supply on Economic Growth in South Africa. An ARDL Approach.
- Dickey, D. A., & Fuller, W. A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica: Journal of the Econometric Society*, 1057-1072.
- Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American statistical association*, 74(366a), 427-431.
- Dunn, A., Grosse, S. D., & Zuvekas, S. H. (2018). Adjusting health expenditures for inflation: a review of measures for health services research in the United States. *Health services research*, 53(1), 175-196.
- Eggoh, J. C., & Khan, M. (2014). On the nonlinear relationship between inflation and economic growth. *Research in Economics*, 68(2), 133-143.
- Eichenbaum, M., Johansson, B. K., & Rebelo, S. (2017). Monetary policy and the predictability of nominal exchange rates (No. w23158). National Bureau of Economic Research.
- Engen, E. M., Laubach, T., & Reifschneider, D. (2015). The Macroeconomic Effects of the Federal Reserve's Unconventional Monetary Policies.
- Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica: journal of the Econometric Society*, 251-276.
- Fakhri, H. (2011). Relationship between inflation and economic growth in Azerbaijani economy: is there any threshold effect?.
- Folland, S., Goodman, A. C., & Stano, M. (2016). *The Economics of Health and Health Care: Pearson International Edition*. Routledge.
- FOMC. (2016). Statement on longer-run goals and monetary policy strategy. amended on January, 29, 2013. *Usd View on Year 2016*, 1(1/1), 1. Retrieved from http://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals.pdf
- Friedman, G., Freeman, R. F., Hilliard, M., Hoyt, E., Jacobson, D., Kelton, S., & Paul, M. (2016). What would sanders do? Estimating the economic impact of sanders' Programs. *Dollars and Sense*.
- Friedman, B. M., & Wachter, M. L. (1974). Unemployment: Okun's law, labor force, and productivity. *The Review of Economics and Statistics*, 167-176.
- Friedman, M. (2017). Quantity theory of money. *The New Palgrave Dictionary of Economics*, 1-31.
- Galí, J. (2007). Monetary Policy, Inflation, and the Business Cycle. Manuscript, CREI and UPF.
- Geyer, C. J. (1992). Practical markov chain monte carlo. *Statistical science*, 473-483.
- Gill, I. S., & Raiser, M. (2012). Golden growth: Restoring the lustre of the European economic model. *World Bank Publications*.
- Guttmann, R. (2016). How Credit-money Shapes the Economy: The United States in a Global System: The United States in a Global System. *Routledge*.

- Glaser, B. G., & Strauss, A. L. (2017). *Discovery of grounded theory: Strategies for qualitative research*. Routledge.
- Gregory, A. W., & Hansen, B. E. (1996). Practitioners corner: tests for cointegration in models with regime and trend shifts. *Oxford bulletin of Economics and Statistics*, 58(3), 555-560.
- Gujarati, D. N., & Porter, D. C. (1999). Essentials of econometrics.
- Hamilton, J. D., & Susmel, R. (1994). Autoregressive conditional heteroskedasticity and changes in regime. *Journal of econometrics*, 64(1-2), 307-333.
- Hasenzagl, T., Pellegrino, F., Reichlin, L., & Ricco, G. (2017, August). A Model of the Fed's View on Inflation. In *presentation at the EEA-ESEM Annual Meetings, Lisbon* (pp. 21-15).
- Hawthornth, John & Chan, Danny. (2015). The World in 2050: Will the shift in global economic power continue?. 10.13140/RG.2.1.5120.7129.
- Hossain, M. S., & Mitra, R. (2017). The determinants of price inflation in the United States: A multivariate dynamic cointegration and causal analysis. *The Journal of Developing Areas*, 51(1), 153-175.
- Howitt, P., & Weil, D. (2012). Economic Growth. *The New Palgrave Dictionary of Economics*, 675–682. <https://doi.org/10.1057/9780230226203.0432>
- Jacobs, L. R., & King, D. S. (2016). *Fed Power: How Finance Wins*. Oxford University Press.
- Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of economic dynamics and control*, 12(2), 231-254.
- Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration—with applications to the demand for money. *Oxford Bulletin of Economics and statistics*, 52(2), 169-210.
- Jones, C. I. (2016). The facts of economic growth. In *Handbook of macroeconomics* (Vol. 2, pp. 3-69). Elsevier.
- Karl E. Case, Ray C. Fair, S. M. O. (2016). *Principles of Macroeconomics, Thenth Edition*.
- Kuttner, K. N. (2014). Low interest rates and housing bubbles: still no smoking gun. In *The Role of Central Banks in Financial Stability: How Has It Changed?* (pp. 159-185).
- Koop, G., Pesaran, M. H., & Potter, S. M. (1996). Impulse response analysis in nonlinear multivariate models. *Journal of econometrics*, 74(1), 119-147.
- Labonte, M., & Makinen, G. E. (2008). Inflation: causes, costs, and current status. Congressional Research Service, Library of Congress.
- Mallett, J., & Keen, C. (2012). Does GDP measure growth in the economy or simply growth in the money supply?. *arXiv preprint arXiv:1208.0642*.
- Mandel, M. (2009). *Economics: The Basics*. McGraw-Hill/ Irwin.
- Meyer, K. E., Ding, Y., Li, J., & Zhang, H. (2018). Overcoming distrust: How state-owned enterprises adapt their foreign entries to institutional pressures abroad. In *State-Owned Multinationals* (pp. 211-251). Palgrave Macmillan, Cham.
- McKinnon, R. I. (2010). *Money and capital in economic development*. Brookings Institution Press.
- OECD (2018), Unemployment rate (indicator). doi: 10.1787/997c8750-en (Accessed on 01 May 2018)
- Okun, A. M., Fellner, W., & Wachter, M. (1975). Inflation: its mechanics and welfare costs. *Brookings Papers on Economic Activity*, 1975(2), 351-401.
- Oliver, M. J. (2017). The political economy of money supply, exchange rate and inflation targets since Bretton Woods, 117–143. <https://doi.org/10.4324/9781315255729-12>
- Platteau, J. P. (2015). *Institutions, social norms and economic development*. Routledge.
- Pham, J., & Bennett, T. (2017). The U . S . Economic Paradox after the 2008 Financial Crisis : Expansion of Money without Inflation Fall 2017.

- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, 16(3), 289-326.
- Pesaran, M. H., & Shin, Y. (1995). Long-run Structural Modelling. Cambridge, Department of Applied Economics, *University of Cambridge* (No. 9419). DAE Working Paper.
- Pesaran, M. H., Shin, Y., & Smith, R. P. (1997). Pooled estimation of long-run relationships in dynamic heterogeneous panels. *University of Cambridge, Department of Applied Economics*.
- Powell, J. H. (2018). *The Outlook for the US Economy: a speech at The Economic Club of Chicago, Chicago, Illinois, April 6, 2018* (No. 996). Board of Governors of the Federal Reserve System (US).
- Quartz. (2017). The US unemployment rate measure is deceptive and doesn't need to be — Quartz. Retrieved May 1, 2018, from <https://qz.com/877432/the-us-unemployment-rate-measure-is-deceptive-and-doesnt-need-to-be/>
- Reserve Board, F. (2016). Powell, Recent Economic Developments and Longer-Run Challenges. Retrieved from <https://www.federalreserve.gov/newsevents/speech/files/powell20161129a.pdf>
- Robinson, D. J., Green, N. V., & Iannone, D. T. (2017). city of shelby economic development action plan.
- Rothstein, J., & Valletta, R. G. (2017). Scraping by: Income and program participation after the loss of extended unemployment benefits. *Journal of Policy Analysis and Management*, 36(4), 880-908.
- Ruzima, Martin. (2016). Impact of inflation on economic growth: a survey of literature review. 5.
- Saymeh, A. A. F., & Orabi, M. M. A. (2013). The Effect of Interest Rate, Inflation Rate, GDP, on Real Economic Growth Rate in Jordan. *Asian Economic and Financial Review*, 3(3), 341–354.
- Sattarov, K. (2011). Inflation and Economic Growth. Analyzing the Threshold Level of Inflation.: Case Study of Finland, 1980-2010.
- Smith, Melanie. n.d. “The Relationship between Inflation and Economic Growth (GDP): An Empirical Analysis.” Retrieved May 30, 2018 (<https://www.ivoryresearch.com/writers/melanie-smith/>).
- Tuli, F. (2011). The basis of distinction between qualitative and quantitative research in social science: Reflection on ontological, epistemological and methodological perspectives. *Ethiopian Journal of Education and Sciences*, 6(1).
- Turner, P. (2010). Power properties of the CUSUM and CUSUMSQ tests for parameter instability. *Applied Economics Letters*, 17(11), 1049-1053.
- Umar, M. A., Kasim, R., and Martin, d. (2012). An overview of property tax collection as a tool for a sustainable local government reform in Malaysia, 2012(2008), 593–605.
- U.S Federal Reserves, (2017).The Fed - Monetary Policy: Monetary Policy Report. Retrieved April 20, 2018, from <https://www.federalreserve.gov/monetarypolicy/2017-02-mpr-part3.htm>
- US Department of Commerce, B. B. of E. A. (n.d.). Bureau of Economic Analysis. Retrieved from <https://www.bea.gov/about/accessibility.htm>
- Wickens, M. (2012). Macroeconomic theory: a dynamic general equilibrium approach. *Princeton University Press*.
- White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica: Journal of the Econometric Society*, 817-838.