The Impact of the Financial Crisis in 2008 on Economic Growth in the USA

Amal Soliman ElGhouty [1]
Faculty of Management Sciences
October University for Modern Sciences and Arts (MSA), Egypt
Email: aasoliman1@msa.edu.eg

Abdel Rahman Kamel Othman[2]
Faculty of Management Sciences
October University for Modern Sciences and Arts (MSA), Egypt
Email: a.ibrahim12576@student.aast.edu

Omar Mohamed Said
October University for Modern Sciences and Arts (MSA), Egypt

Youssef Rehab Tawfik[3]
October University for Modern Sciences and Arts (MSA), Egypt
EMAIL: youssef.rehab@msa.edu.eg

Abstract   To investigate and determine the effects of unemployment, inflation, and imports on economic growth in the United States within the specified period as in the paper taking into account the 2008 financial crisis. Design/methodology/approach - The Ordinary Least Square (OLS) technique was adopted with some diagnostic tests to determine how fit the data for the analysis are. The Diagnostic test result indicates that data for the study are stationary at the 5% level and a significant relationship exists between GDP growth rate and imports growth rate with no significant impact of inflation and unemployment.

The study uses only OLS and Diagnostic to carry out the analysis and it only covers the period from 1972-2012. The originality of this study lies in being the first comprehensive study to take into account the impact of three main variables: imports growth rate, unemployment growth rate, and inflation rate on GDP growth rate in the United States over 40 40-year periods from 1972 until 2012.

Keywords: GDP growth rate, inflation, Unemployment, Imports

[1] ORCID iD: 0000-0002-6665-853X
[2] ORCID iD: 0000-0001-6508-1268
[3] ORCID iD: 0009-0009-5341-4753.

Introduction

The United States' Federal Bank had challenges in the third quarter of 2008 as both domestic and international financial systems faced a possible economic catastrophe. It was getting obvious that financial institutions might eventually suffer losses of dozens or possibly thousands of trillions of dollars as a result of excessive position to mortgage sector lending. Bank authorities instructions were clear in that lending does not exceed a certain ratio of capital, which reveals how tightly related bank loan is to capital requirements. As a result, the Banking System was in risk of a dramatic decline in bank loans, which might have resulted in a severe depression or worse (Federal Reserve Bank, 2010).

Once anything similar occurs, the federal bank's responsibility is to ensure that commercial firms have always had the resources they must carry out for their regular operations and the "cash flow" they require to perform prompt payouts and transactions. The financing of today's banking systems has to be replenished daily. Billions of dollars are exchanged among banks every day in the USA on its own to fund the fifty trillion dollars in total current credit in the economic system. Business institutions need money to start the mortgages, vehicle lending, and credit card debt they later sell on the finance system, whereas financial institutions lend money every day to support a large portion of their operations (Wallison and Burns, 2011).

Initially, during the recession, it frequently happened that large-capitalized banks were compelled to issue lending on the basis of pledged credit lines. Inside this situation, central bank interventions may reduce cash restrictions by giving banks the funding they require. When time came to offer financial flow in October of year 2007, the Central Bank effectively permitted banks to convert inventories of Treasury bonds into existing dollars. The financial institutions were ready to fulfill their existing line of credit obligations (Cecchetti, 2008).

Yet, it was evident during the fall of the year 2007 that the usefulness of conventional banking system instruments was inadequate. Federal authorities amended its stocks and bonds lending program by introducing the term stocks and bonds Lending Facilities after realizing these flaws and developing creative fresh lending methods during the shape of the Contract Bidding Facilities and the Main Dealers Line of credit. It is important to understand that there is a limit to what these central bank tools can accomplish (Cecchetti, 2008).Personal loans could resume its upward trajectory if cash was already restored after damages have depleted liquidity ratio to the level that governmental restrictions become unavoidable. Banks must get a shift mostly from fiscal officials or obtain fresh capital from external shareholders in order for things to get back to normal. The

Government's capacity to loosen capital restrictions is constrained because it is basically outside the zone of affecting these transactions (Cecchetti, 2008).

The paper is mainly studying the impact of the 2008 financial crisis on the United States of America's gross domestic product (GDP), and the factors that affected the US GDP, focusing on inflation, unemployment and imports. Therefore, the paper is divided into the following sections: literature review, followed by graphical analysis, then, model specification and variable construction, empirical analysis and finally conclusion.

Literature Review

The global financial crisis started when a housing bubble in the US burst and home prices dropped sharply beginning the late 2006. The availability of risky subprime mortgages contributed to the building of this bubble. People started defaulting on loans in historic numbers after the housing bubble burst, especially those with subprime mortgages. This quickly spread throughout the financial services sector. The Federal National Mortgage Association (Fannie Mae), the Federal Home Mortgage Corporation (Freddie Mac), and Countrywide were a few of the first significant mortgage lenders to go under. In a deal facilitated by the government, Countrywide was acquired by Bank of America, and Fannie Mae and Freddie Mac were taken over by the government (Campbell, 2011).

The financial crisis of 2007–2008 was the worst since the Great Depression of the 1930s. Lehman Brothers and other well-known financial institutions failed as a result of the crisis, which also forced the global credit markets to fail and forced unprecedented worldwide government involvement. For instance, the American government launched the TARP program in October 2008 to purchase or ensure financial institutions' assets valued up to $700 billion. The British government unveiled a bank bailout program that included loans and guarantees totaling £500 billion ($740 billion) in the same month (Erkens et al., 2012). Two firm-level practices, risk management before the crisis and equity capital raising during the crisis, have drawn the attention of academics and investors. These procedures significantly influenced how much money shareholders lost during the crisis. According to Brunnermeier (2009), the interplay between banks' exposure to subprime mortgages and their reliance on short-term borrowing had a significant impact on the performance of financial firms during the crisis. As the value of risky assets fell during the crisis, financial institutions were forced to raise capital since they could no longer rely on rolling over short-term loans backed by these assets. During the crisis, raising equity capital was very expensive for shareholders because it caused a large transfer of wealth from owners to debtholders (Erkens et al., 2012).

As for the exchange rate, the global financial crisis of 2007–2009 saw unprecedented exchange rate changes. Regardless of the Asian Crisis of 1997 and the crisis of the Russian Debt Default in 1998, many countries as well far from the crisis center saw their currencies decline significantly in 2008. For many nations, such crisis-related movements are sharply reversed. These advances are most likely the result of two things. First, safe haven effects during the most recent crisis deviated from the regular pattern of crisis-related flows. Second, compared to earlier periods, the 2008–2009 exchange rate swings associated with the crisis are better explained by interest rate differentials. Most likely, this is due to structural changes in the things that affect exchange rate dynamics, like the growing importance of carry trading (Kohler, 2013).

Financial crises are frequently accompanied by substantial fluctuations in exchange rates, which reflect both growing risk aversion and shifts in how risky investors view certain currencies. The 2007–2009 global financial crisis was hardly an exception. The exceptional (and unexpected) US dollar appreciation has received the majority of attention in earlier research on currency rate movements during the crisis. To look at the other side of this change, this section looks at how the exchange rates of several emerging markets and small advanced economies have changed against the Japanese yen, the Swiss franc, and the US dollar. Many currencies that were not at the center of the upheaval were devalued during the crisis. Within a year or so, these movements started to reverse. When contrasted to the events that occurred during the Asian financial crisis in 1997–1998 or the crisis that followed the default of the Russian debt in the middle of 1998, both of these instances stand out. We focus on two elements that may partially account for these peculiar patterns. First off, during the most recent incident, safe haven movements deviated from the traditional pattern associated with crises: rather than leaving the nation at the center of the problem, they moved into it. Second, interest rate differences explained more of the crisis-related exchange rate swings than they had in the past. One reason for this finding could be the rise in carry trade activity during the previous 15 years. If so, more fundamental changes may have been made to the dynamics of exchange rate swings during crises (Kohler, 2013).

There is some evidence that there is a direct correlation between pegged exchange rates and considerably better inflation performance (lower inflation and less volatility). There is, however, one crucial qualification. Frequent parity adjustments in nominally fixed countries make it unlikely for them to completely benefit from the deflationary effects of fixed exchange rates. Economic growth is impacted by the regime of the chosen exchange rate. Increased investment is associated with fixed rates. However, they are linked to a slower rise in productivity. The average rate of production growth is a little lower when exchange rates are fixed. Additionally, the inability to use the nominal exchange rate as an adjustment mechanism causes growth and employment to fluctuate more frequently.

Last but not least, a country's overall macroeconomic strategy is up to the government to determine which suits its nation better.. Pegging the exchange rate could be an advantageous tactic for nations dealing with deflation. A more flexible approach would be needed, though, if growth has been slow and actual exchange rate misalignments are extensive. The choice is fully up to the nation, just like the trade-off.

Investigating the connections between inflation targeting and financial stability in the UK as an example is an intriguing case. In October 1992, the Bank of England unveiled a fresh approach to monetary policy: inflation targeting. While setting an explicit inflation target gives the goal of price stability priority, inflation targeting does not prevent the inclusion of other monetary policy goals. This was confirmed by the Bank of England Act of 1998 (Act), which mandated that the BoE uphold price stability and, subject to doing so, support the administration of Queen, including its goals for economic growth and employment (Zhu et al., 2021).

The British government and the UK's central bank took a number of crucial actions to assist country recover from the economic downturn and financial crisis. In the workflow, it was not always simple to distinguish between monetary and financial (or banking sector) activity. It is always critical to recall authorized terminology so to avoid misunderstanding (Champroux, 2016).

In an endeavor to spur economic growth, the authorities decreased its Tax rates in November 2008. However, property prices had decreased by 10.5%. From January through December, the FTSE 100 fell by 31.3%. It has had the greatest yearly drop ever since inception in 1984. Since the market was also still declining, there was little space for expansion. Furthermore, the very same trend was spreading to the whole world, with corporations such as GM, the world's biggest carmaker, duplicating it (Richards, 2022).

The previous papers written to investigate the impact of either inflation, unemployment or imports on economic growth showed different results. Many factors contribute to these differences. According to Ademola and Badiru (2016), there is a positive relationship between unemployment, inflation and RGDP in Nigeria in the period 1981-2014 and they explained this by the dependency of RGDP in Nigeria on oil revenue that employs very few highly skilled labor while the price of output of crude oil is determined externally. In another study by Sinha(2022), he found that Inflation had a bad impact on RGDP, while unemployment had no significant impact on RGDP in India over the period 1990-2021. In South Africa, the effect of inflation and unemployment was negative on economic growth over the period 1994-2018 (Sekwati and Dagume, 2023).

Financial crisis had a significant negative impact all over the world, especially on USA. Therefore, we will investigate the impact of inflation rate, unemployment

rate, and import of goods and service growth rate on the GDP growth rate of USA during the period 1972 to 2012.

Figure 1. GDP growth rate in USA from 1972-2012
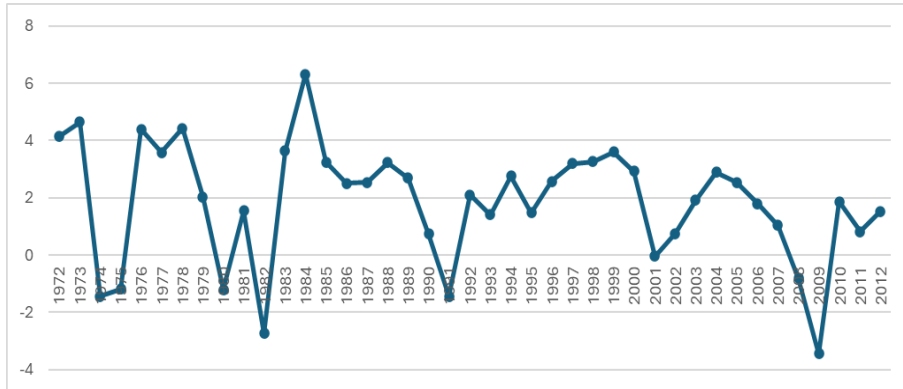
Source: World Bank group

Gross domestic product (GDP) means the overall financial or commercial worth of all completed products and activities generated within the boundaries of a nation during a certain timeframe. As a wide indicator of total national output, it serves as an all-encompassing indicator of a nation's financial condition.

The graph above shows the USA's GDP, from 1972 to 2012. The graph shows a fluctuation in the GDP due to the many events that the US economy went through. Starting with the 1972s' stagflation which caused a decrease in the GDP while the 1970 recession was already there, to 1975 when the Recession ended which caused an increase in the GDP. After that, in 1983 Tax hikes and defense spending occurred causing an increase in GDP (Amadeo, 2022). In 1991, the US entered a recession that continued for 8 months which caused a decrease in the GDP. In 1992 North American Free Trade (NAFTA) was signed by the US, Canada, and Mexico which caused an increase in the GDP. In 2001 the 9/11 attacks occurred which caused a decrease in the GDP. Finally, in 2008 the Financial Crisis occurred, causing a decrease in the GDP (Amadeo, 2022)

Figure 2. Unemployment rate in USA from 1972 to 2012
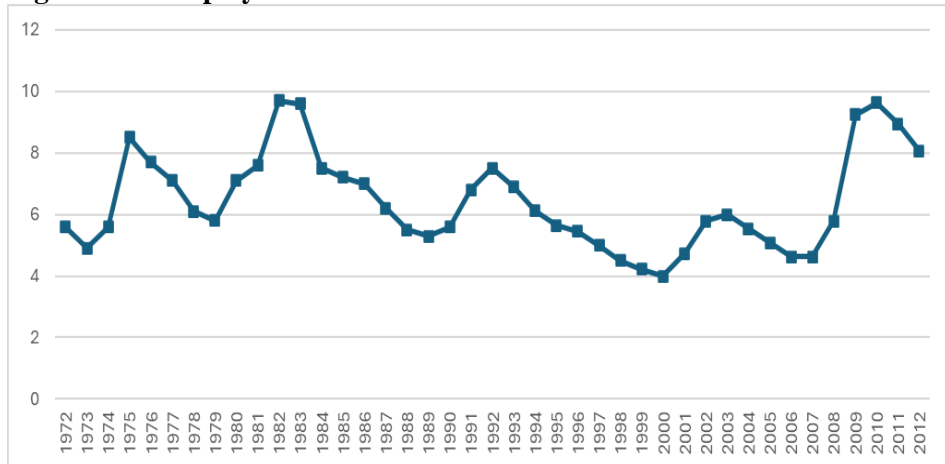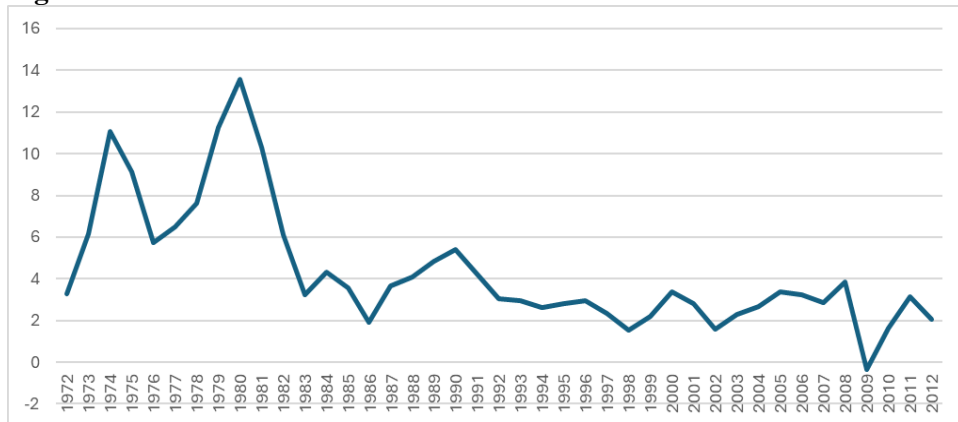

Source: World Bank group

The rate of unemployment is the portion of the working population that is in the labor force but not working. It is a temporary blip, meaning that it increases and drops in reaction to shifts in the economy instead of anticipating them. Whenever the market is in bad shape and job possibilities are scarce, the jobless rate is most likely to increase. Unemployment has great importance among the macroeconomic problems. If any country experiences unemployment, it will not only negatively impact on the economic indicators of that country but, it will also hurt the social standards of such country.

The graph above shows the USA's Unemployment rate, from 1972 to 2012. The graph shows a fluctuation in Unemployment due to some recessions that the US economy went through. First of all, the 1970 recession came to an end in 1975, which made a decrease in unemployment. In 1979 another recession occurred that lasted for 3 years which caused an increase in unemployment, until it is done in 1982 causing a decrease in unemployment(Amadeo, 2022). Moving to 1992 when North American Free Trade (NAFTA) was established as we mentioned before, many job opportunities were created causing a decrease in unemployment. After that, Long-Term Capital Management (LTCM) crisis occurred bringing an increase in unemployment with it, compelling the United States authorities to interfere to avoid the collapse of the financial markets. Finally, in 2008 the Financial Crisis occurred, causing an increase in unemployment (Amadeo, 2022).

Figure 3. Import growth rate in USA from 1972 to 2012
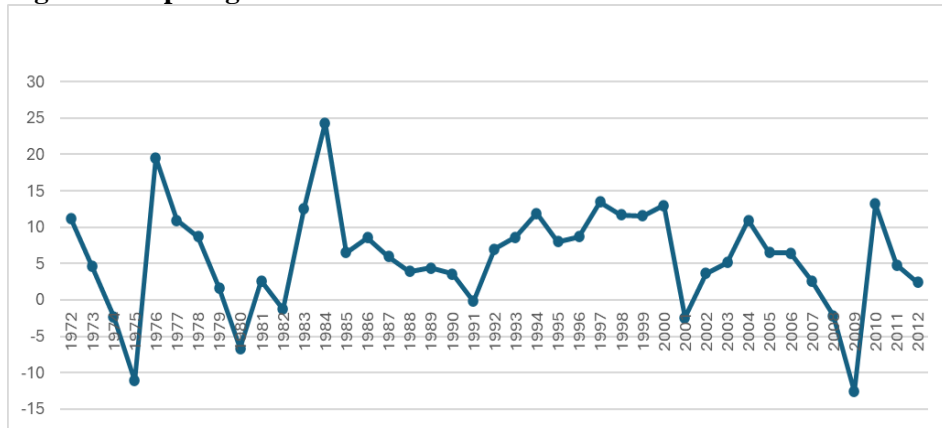
Source: World Bank group

Consumers are accustomed to finding goods from all over the world at their neighborhood grocery stores and retail outlets in today's global economy. Consumers have more options thanks to these imports from other countries. Imports also assist consumers in managing their tight household budgets because they are typically produced more inexpensively than any domestically produced counterpart. A nation's trade balance can be distorted and its currency devalued if there are too many imports relative to its exports. Because the value of a currency is one of the main factors of a country's economic success and its gross domestic product, it can have a significant impact on the residents' day-to-day lives. A nation must maintain a healthy balance between imports and exports. A country's import and export activities can have an impact on its GDP, exchange rate, degree of inflation, and interest rates (Kramer, 2022). Since 1975, the United States has consistently a trade deficit because of heavy imports of consumer goods and oil. The fast, severe, and coordinated collapse of world trade in late 2008 was the most profound since World War II and the sharpest in recorded history. Between the third quarter of 2008 and the second quarter of 2009, there was a "great trade collapse." It was significant—the sharpest decrease in recorded global trade since the Great Depression—and there are signs that it is over and the recovery process has started. Three times since World War II, there have been declines in global trade, but this is by far the biggest. Figure 3 demonstrates that throughout three of the world recessions that have occurred since 1965—the oil shock recession of 1974–75, the inflation–defeating recession of 1982–83, and the tech-wreck recession of 2001–02—global commerce declined for at least three quarters (Baldwin, 2009)

Figure 4. Inflation rate in USA from 1972 to 2012

Source: World Bank group

Inflation is defined as an increase in prices that results in a loss of buying power over time. The average price increase of a basket of selected goods and services over time might show the rate at which buying power declines. Inflation is another macroeconomic problem which hurts both economic and social norms in any country. The graph above shows the inflation rate in the United States between the year 1972 and the year 2012. The data shows a substantial increase in the inflation rate from the 1970s to the middle of the 1980s. This is due to the oil embargo set by the OPEC countries in 1973. Wage-price regulations drove firms to maintain wages high, resulting in layoffs to save expenses. At the same time, they were unable to reduce prices in order to increase demand. It had plummeted as a result of employment losses. The data shows a healthy rate of inflation all through the 1990 up until the 2012.

Test of Stationarity

Comparing the Augmented Dickey-Fuller test statistic with the critical value at the 5% significance level, the table shows that all variables are stationary except for inflation (Appendix I).

Model Specification and Variable Construction

The Ordinary Least Squares regression method is used to examine the effect of our independent variables on the GDP growth rate in the United States. Ordinary least-squares (OLS) regression is a generalized linear modelling technique that can be used to model a single response variable which has been recorded on at least an interval scale. The technique may be applied to single or multiple explanatory variables and also categorical

independent variables that have been appropriately encrypted (Hutcheson, 2011).

This model will represent how the GDP growth rate of USA is affected by the changes in inflation rate, unemployment rate, and import growth rate.

This equation below represents the relationship between the dependent variable (GDP growth rate) and the independent variables (inflation rate, unemployment rate, import growth rate):

$$Y_t = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon_t. \qquad (1)$$

The estimated equation is:
$$Y_t = 1.5 + 0.07X_1 + 0.25X_2 - 0.22X_3 \qquad (2)$$

Where Y is GDP growth rate, X_1 is inflation rate, X_2 is import growth rate, X_3 is unemployment rate.

Empirical analysis

The significance of the parameters
Table 1: Regression Analysis of the effect of Inflation rate, Import growth rate and Unemployment rate on GDP growth rate

This table reports the ordinary least squares regression model results of Equation 1 using a sample that includes 40 observations in USA during the period 1972-2012. The dependent variable is GDP Growth Rate. The independent variables are; Inflation Rate, Import Growth Rate and Unemployment Rate. The t-statistics are reported in parentheses. ** denote the 95% significance level along with other results.

Equation	GDP Growth Rate
Inflation Rate	0.07 (1.45)
Import Growth Rate	0.25 (10.27)**
Unemployment Rate	0.22 (-2.17)
F-Statistic	41.07
R^2	0.77

A) Inflation rate

Since the t-tabulated equals 2.329 less than the t-calculated 1.45, so we don't reject the null hypothesis, it indicates that there is no significant relationship between inflation rate and GDP growth rate. In a previous study

done by Kasidi and Mwakanemela (2013), they found no significant relationship between inflation and economic growth in the long run in Tanzania. The study covered the period 1990-2011.

B) Import growth rate

Since the t-tabulated equal 2.329 and the t-calculated of import growth rate calculated is 10.27, so the test in the rejection region as a result we will reject the null hypothesis, it indicates that there is linear and significant relationship between import growth rate and GDP growth rate. Economically speaking, it is known that with an increase in the income of the nation, the nation's spending will increase, and some of the spending will be on imports. It is a causal relationship.

C) Unemployment rate

Since the t-tabulated equal 2.329 and the t-calculated of unemployment rate calculated is -2.17, so the test in the non- rejection region as a result we will don't reject the null hypothesis, it indicates that there is no linear relationship and there is no significant relationship between unemployment rate and GDP growth rate. According to Dayioglu and Aydin (2020), it is detected that the relationship between economic growth and employment has become very weak or, became more complex in recent periods. There is neither a one-to-one nor a stable relationship between growth and employment, especially with the developments in countries 'economies.

The significance of the whole regression

F-statistics test using $\alpha = 0.05$, degrees of $freedom_1 = k-1 = 2$ and degrees of $freedom_2 = n-k = 40-3 = 37$, which means that the test from f-table is 3.23 and f-calculated is 41.07. Therefore, f-calculated is more than f-tabulated which means that we will reject null hypothesis, as a result the entire regression is significant.

Descriptive statistics

The results from descriptive data showed that the mean of independent variables of inflation rate is 4.35, import growth rate is 5.86, and unemployment rate is 6.42, as for the dependent variable the mean of GDP growth rate is 1.85. The standard deviation of the GDP growth rate is 2.07, inflation rate is 2.99, import growth rate is 7.25, and unemployment rate is 1.57. Therefore, the highest standard deviation that has the highest risk is the import growth rate and the variable that has the lowest standard deviation and the lowest risk is unemployment rate (Refer to Appendix I).

The coefficient of determination

Since the R^2 in our model equal 0.77 this means that the independent variables (Inflation rate, unemployment rate, and import growth rate) variables affect the dependent variable GDP growth rate by 77%.

Durbin-Watson and auto correlation

H_0: ρ = 0
H_1: ρ ≠ 0
According to the results of our data, the Durbin-Watson equal to 2.16, from the Durbin-Watson table for sample size 40 and k equal 3 with significance level of 5%, the d_l = 1.149 and d_u = 1.456. Therefore, we don't reject the null hypothesis because d-calculated is greater than d-tabulated (d_l, d_u), so there is no autocorrelation.

Correlation matrix

The results from correlation matrix showed that there is no multicollinearity, since the correlation between import growth rate and inflation rate is -0.32, between import growth rate and unemployment rate is -0.14, and between inflation rate and unemployment rate is 0.06; as it is clear from the results that the numbers are not close to 1 this means that there is no multicollinearity (Refer to Appendix I).

Conclusion

We investigate the relationship between GDP growth rate, Import growth rate, inflation rate and unemployment rate in the United States. Our study is the first comprehensive study to take into account the impact of three main variables: Imports growth rate, Unemployment growth rate and inflation rate on GDP growth rate over 40 years period from 1972 until 2012. The study used the ordinary least squares method to investigate the relationship among the above mentioned variables. The only independent variable to show significant impact on GDP growth rate is Imports growth rate. The findings of this paper are robust to alternative methodologies. Many factors such as; microeconomic variables, political instability, global financial crises and exchange rates can have an impact on GDP growth rate in the United States. The impact of the above-mentioned variables on GDP growth rate is beyond the interest of this paper and calls for further investigations in future researches. In addition, the results of this research

must be interpreted carefully and not generalized to all developed countries. Further researches must examine more developed and emerging countries, in order to better understand the impact of the above used independent variables on Economic growth rate. Finally, the researcher believes that this study provides wide scope for further research to investigate other factors and their effect on GDP growth rate in the United States. The following are some suggestions for future research: i) this research could be extended to cover the last 10 years. This helps to identify a clear picture of how the above used macroeconomic variables affect GDP growth rate over time. ii) a comparative study between the United States and another developed country in the same context can be investigated. In this case, one could gain better insight on the comparative impact of these macroeconomic variables on GDP growth rate in two different environments, and iii) In addition, researchers can investigate other factors (microeconomic, political, etc.) and their effect on GDP growth rate in the United States.

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Appendix

Estimation equation

Dependent Variable: GDP
Method: Least Squares
Date: 12/11/22   Time: 12:53
Sample (adjusted): 1 41
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.518737	0.787179	1.929341	0.0614
INF__RATE	0.084356	0.058105	1.451788	0.1550
IMP_GRTH	0.248369	0.024188	10.26824	0.0000
UNEMP_	-0.232124	0.106319	-2.183268	0.0354

R-squared	0.769075	Mean dependent var		1.848558
Adjusted R-squared	0.750352	S.D. dependent var		2.082428
S.E. of regression	1.040481	Akaike info criterion		3.009711
Sum squared resid	40.05622	Schwarz criterion		3.176889
Log likelihood	-57.69908	Hannan-Quinn criter.		3.070588
F-statistic	41.07516	Durbin-Watson stat		2.160729
Prob(F-statistic)	0.000000			

Descriptive data

	GDP	IMP_GRTH	INF__RATE	UNEMP_
Mean	1.848558	5.858460	4.363762	6.433415
Median	2.096613	6.420259	3.272278	5.990000
Maximum	6.312168	24.34324	13.54920	9.700000
Minimum	-3.450016	-12.60977	-0.355546	3.990000
Std. Dev.	2.082428	7.248544	2.989157	1.566516
Skewness	-0.601388	-0.269315	1.442088	0.609581
Kurtosis	3.164696	3.811560	4.552104	2.459993
Jarque-Bera	2.517732	1.620785	18.32613	3.037356
Probability	0.283976	0.444684	0.000105	0.219001
Sum	75.79089	240.1969	178.9142	263.7700
Sum Sq. Dev.	173.4602	2101.655	357.4024	98.15892
Observations	41	41	41	41

Correlation

	GDP	IMP_GRTH	INF__RATE	UNEMP_
GDP	1.000000	0.852703	-0.167951	-0.299104
IMP_GRTH	0.852703	1.000000	-0.319813	-0.154063
INF__RATE	-0.167951	-0.319813	1.000000	0.071874
UNEMP_	-0.299104	-0.154063	0.071874	1.000000

Unit Root Test on GDP growth rate

Null Hypothesis: GDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.790687	0.0004
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 12/18/22   Time: 13:01
Sample (adjusted): 1973 2012
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.737568	0.153959	-4.790687	0.0000
C	1.304129	0.429441	3.036806	0.0043

R-squared	0.376545	Mean dependent var	-0.065125
Adjusted R-squared	0.360138	S.D. dependent var	2.534155
S.E. of regression	2.027105	Akaike info criterion	4.299801
Sum squared resid	156.1478	Schwarz criterion	4.384245
Log likelihood	-83.99602	Hannan-Quinn criter.	4.330333
F-statistic	22.95068	Durbin-Watson stat	1.915314
Prob(F-statistic)	0.000025		

Unit Root Test on Inflation rate

Null Hypothesis: INF__RATE has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.044518	0.2675
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF__RATE)
Method: Least Squares
Date: 12/18/22   Time: 13:34
Sample (adjusted): 2 41
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF__RATE(-1)	-0.203963	0.099761	-2.044518	0.0479
C	0.871672	0.531141	1.641130	0.1090

R-squared	0.099100	Mean dependent var	-0.030074
Adjusted R-squared	0.075392	S.D. dependent var	1.946512
S.E. of regression	1.871698	Akaike info criterion	4.140276
Sum squared resid	133.1237	Schwarz criterion	4.224720
Log likelihood	-80.80552	Hannan-Quinn criter.	4.170808
F-statistic	4.180052	Durbin-Watson stat	1.435075
Prob(F-statistic)	0.047876		

Unit Root Test on Import of goods and service (annual growth rate)

Null Hypothesis: IMP_GRTH has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.168204	0.0001
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IMP_GRTH)
Method: Least Squares
Date: 12/18/22   Time: 13:14
Sample (adjusted): 2 41
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IMP_GRTH(-1)	-0.821228	0.158900	-5.168204	0.0000
C	4.661019	1.486978	3.134558	0.0033

R-squared	0.412768	Mean dependent var	-0.220131
Adjusted R-squared	0.397314	S.D. dependent var	9.356727
S.E. of regression	7.263893	Akaike info criterion	6.852416
Sum squared resid	2005.037	Schwarz criterion	6.936860
Log likelihood	-135.0483	Hannan-Quinn criter.	6.882948
F-statistic	26.71034	Durbin-Watson stat	1.939128
Prob(F-statistic)	0.000008		

Unit Root Test on Unemployment rate

Null Hypothesis: UNEMP_ has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.495577	0.0134
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UNEMP_)
Method: Least Squares
Date: 12/18/22   Time: 13:35
Sample (adjusted): 3 41
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UNEMP_(-1)	-0.355784	0.101781	-3.495577	0.0013
D(UNEMP_(-1))	0.483459	0.150396	3.214577	0.0028
C	2.321336	0.664166	3.495114	0.0013

R-squared	0.311815	Mean dependent var	0.081282
Adjusted R-squared	0.273582	S.D. dependent var	1.072612
S.E. of regression	0.914188	Akaike info criterion	2.732243
Sum squared resid	30.08665	Schwarz criterion	2.860210
Log likelihood	-50.27874	Hannan-Quinn criter.	2.778156
F-statistic	8.155752	Durbin-Watson stat	1.901382
Prob(F-statistic)	0.001199		