The reflection of the federal budget deficit on the economic cycle in the United States of America

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Abstract

In its report presented by the US Congress in January 2021, in which it explained that the American economy is going through a worrisome recession and that the real financial situation of the United States of America is worrisome, so the researcher's interest was to what extent the federal budget deficit affects the American economic recession? The World Bank data were relied upon, and a multiple regression model was used using EVIEWS to demonstrate the extent of this effect. It has been shown that the federal budget deficit affects by 70.6%, and the inability of the federal government to restore the financial balance may directly reduce the confidence of businessmen and consumers, which discourages investment, which exacerbates the financial imbalances, and the government debt may not shows its negative effects in the short term, but it is a long-term threat. Therefore, the research recommended that there is an urgent need to reduce the federal budget deficit rate, which requires there to be coordination between monetary policy and fiscal policy. The goal of increasing economic growth can be achieved by using the deficit financing policy without the occurrence of monetary problems due to the effect of competition and the occurrence of inflationary waves.

Key words

 Economic cycle - U S A- Public budget deficit -Reflection

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1. Introduction

The Great Depression in 1929 led to a sharp decline in US tax revenues at the time of the Herbert Hoover Administration 1929-1933, and to increase tax revenues, taxes were imposed on imported goods and taxes on income were increased, which led to much damage to the American economy. Then the Theodore Roosevelt administration came to work to return to the balance in the federal budget, but when he took over in 1933 he was forced to run a deficit in the federal budget to address the mistakes of the Hoover administration. Unemployment rates were increasing until it got out of control, reaching 25%, and so Roosevelt had to manage to avoid this problem, which was exacerbated in countries such as Italy and Germany. Roosevelt therefore decided to increase the budget deficit through a paradigm shift by John Keynes 1936, which made it clear that the government should play an active role to help the economy out of the crisis. Keynes also made clear that there is no problem with a deficit in the state budget in order to get out of the recession that afflicted the United States of America and the rest of the world during that period, as waiting until automatic adjustment will take a long time that exacerbates the economic crisis and does not address it as the classic claimed (Perry, 2014).

Federal government revenues increased between 1900 and 2012 from 3% of GDP to 16.50%, and federal expenditures increased from 2.7% to 24% between 1930 and 2012. Local federal government revenues also increased from 8% to 13% of output. GDP, while public expenditures increased from 9.1% to 14.8% for the same period. Public expenditures amounted to about 45% of GDP during the Second World War, then declined rapidly after the war to about 14%, but it jumped by more than 22% with the Korean War, as it can be attributed to the failure of reducing public expenditures to the extended Cold War Most of the expenditures in wartime were through deficit financing and issue money. Average federal expenditures - from 1950 to 2006 - exceeded the maximum level of expenditures at the height of the First World War. And while federal expenditures were much higher than before, they remained within a relatively

narrow range from World War I to the mid-twentieth century (Schuyler, 2014).

Since the Second World War, the American economy has witnessed eleven economic cycles that followed each crisis, a stage of expansion and economic prosperity, except for the 2008 crisis until 2020. An economic recession occurred in the years 1948, 1953, 1960, 1969, 1973, 1980, 1990, 2001, 2007, all of these crises immediately preceded a boom except for the 1981. The economic cycles in the American economy have a prominent feature (Salah al-Din, 2010). From periods of recession and economic recession, it is weak, as the continuation of unemployment rates after the Great Depression appears to be a continuation of previous trends and not due to financial crises (Stephen. 2010).

In a report presented by the US Congress, in which it compared the unemployment rate in the United States of America in 2020, which is an economic recession that the US economy is going through, and the unemployment rate after the Great Depression of 1929, where the unemployment rate witnessed a remarkable rise in some important sectors in the United States of America, reaching 39.3. % in April 2020 in the entertainment and hospitality sector then declined to 16.7% in December 2020. This is at a time when unemployment rates in the service sector remained high, and sectors such as mining witnessed an unemployment rate of 13.1% in December 2020, which is the second highest rate among all industries. Unemployment rates among women have also witnessed 36.6% and 12.1% for men. (CRS, Reports, 2021).

It was also noted that the real financial situation of the United States of America since 2000 has tripled the total debt owed by the state to nearly 17 trillion dollars, and this matter is very worrying, especially after the health, medical and social security obligations that the US government committed to, which reached The total in 2012 is about 50 trillion dollars, and the federal government has also provided large aid, especially for places affected by natural disasters such as earthquakes, floods, and hurricanes, in addition to recent financial crises and defaults on pensions and student loans.(Kaplan , walker ,

2014) According to the Constitution of the United States of America, Congress is responsible for the federal budget deficit, as it is the one that approves spending bills, and only the president has the right to veto, and Congress is responsible for many policies such as the tax rate, spending bills and economic policies that affect tax revenues (Perry 2014) **.** Hence, the research problem is, to what extent does the federal budget deficit affect the stage of economic recession that the US economy is going through?

2- Literature review

The classical theory referred to the problem of the state's public budget deficit, as it showed that it has an effect on increasing current consumption by the government or consumers, and that investment is negatively affected by taxes, so investment decreases with increasing taxes, and by increasing consumption, savings decrease, which leads to higher interest rates investment reduces, and the classical theory relates to what causes the budget deficit to rise in interest rates. Keynesian theory also acknowledged the potential effect of crowding out, yet it did not believe that any economy would face full competition if there was a recession in the economy. Keynes stated that the economy will face only partial competition with practically no competition in times of depression, and what is evidenced by this is that saving and investment decisions do not depend only on the rate of interest, but also on future profit expectations, which in turn depend on businessmen's accounts that in turn depending on the state of mind and emotional psychology of the investor. In times of economic recovery, companies buy capital goods because their profits are high and they are optimistic about the future, While in times of recession, businessmen have a pessimistic view of the future regarding the economy, which is the opposite of the situation in which companies will bear fruit if they only pay attention to the cost of borrowing (the interest rate) and ignore future expectations. The Keynesian theory also showed that there is an inverse relationship between the ratio of the primary fiscal deficit to income and economic growth (Perry 2014).

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Milton Friedman also attributed economic fluctuations, instability and economic crises to changes in the amount of money that are not commensurate with changes in the production of goods and services. Milton Friedman also attributed most of the economic fluctuations from an economic contraction or recession to a decrease in the growth rates of money supply, and the cases of expansion and economic recovery are preceded by an increase in the rates of money supply. (Salah al-Din, 2010). There is an indirect effect of the expected rate of inflation and the expected rate of return, as currencies are inversely related to the state budget deficit. When the government faces a deficit in the budget, the possible method of financing is to increase government borrowing, which puts upward pressure on real interest rates. High interest rates attract foreign capital inflows and thus the currency value rises in return. (Yuli Su, Ming Su, 2003)

The economic recession in the USA in 2008 was atypical as there was a weak fiscal response to countercyclical "The increase in net government borrowing was much less than the decrease in private borrowing, which is an unprecedented inconsistency historically. another study by (Aizenman, Marian , 2009) also pointed out that the ratio of public debt to GDP can be reduced by increasing the gross domestic product, which requires the necessity of a strong economic recovery, and high inflation rates lead to the erosion of the real value of the debt. That the creditors keep and the actual debt ratio with foreign creditors, which makes them bear the burden of inflation, and the government can use the tax revenue to recover some debts, and finally, if the state fails to pay its debts. The Big Seven countries set a maximum budget deficit of 5% of the state's GDP as a safety limit that should not be exceeded (Steven, 2010) while the European Union has set 3% as a minimum for the country wishing to join the European Union. The Stephen study 2010, finds that global debt levels lead to higher interest rates, which in turn lead to high discount levels, which indicates that the financial problems currently facing industrialized countries need to develop quick solutions. Because the delay will lead to a sudden and unexpected increase in government bonds return in the medium and long terms, which would threaten the credibility of current unilateral policy arrangements. There is also another fact,

which is the rapid increase in public debt rates in the United States of America, as taxes decreased at a time when American public expenditures increased to stimulate demand, as well as, the expenses of Corona virus treatment and health care.

While (Taylor, Proano, Carvaho, Barbosa, 2011), study indicates a strong positive effect on the growth of a higher primary deficit even when potential interest rate increases are taken into account. The study of (Abdul Latif, 2011) also showed that the most important variable that had a positive impact on reducing unemployment rates is oil prices and the size of economic growth. The double deficit appeared in the United States of America in the eighties, when the budget deficit appeared accompanied by a deficit in the current account of the balance of payments.

Another study (Tang , 2014) found that a 1% increase in the federal budget deficit leads to a 0.43% increase in the current account deficit of the United States of America during the period from 1973-2008. Governmental public debt crises always lead to negative consequences on economic, social and political life, and the faltering government cannot efficiently perform its main functions, such as providing public goods. In some cases, procedures for expropriation from citizens are the solution, violating basic property rights and economic freedoms to get out of the financial crisis, as happened, for example, in France before the revolution of 1789, or in Argentina, where defaulting on government debts led to high inflation and depreciation in the national currency, the succession of banking crises, loss of personal savings and a decrease in credit ratings, all of which undermine confidence in the government, destabilize political stability and lose the state's foreign political standing.(Wski , 2014).

In another study (Enrique, 2017) was concluded that US tax adjustments may not aid the US federal debt to be sustainable and will have negative effects on US macroeconomic variables. The appetite of the United States of America towards an increase in government debt may be based on the strength of the US economy, followed by a slow-moving outcome from financial globalization in an environment in

which the US financial markets are more developed and the expected financing needs of the US government are large (Yard, 2019). and in his opinion that the level of government debt has no effect on real economic activity because government borrowing can be retreated by private actors, for example if the government imposes taxes and borrows today, the private sector expects an increase In taxes by the government that needs to pay off those debts, tax cuts are used today to save through government bonds to cover a higher tax burden in the future, and the government's decision to borrow more did not affect consumption, employment and investment.

While the researcher is trying to measure the impact of the US federal budget deficit on the unemployment rate in America, Which causes the American economy to enter the stage of economic stagnation, whose impact is not limited to the American economy only, but extends to the rest of the world.

3- Research methodology

The research used a multiple regression model using EVIEWS and relying on World Bank data to show the effect of the explained variables on the dependent variable where, Y, the unemployment rate in America, and the research settled - after studying a group of previous literature - on a set of independent variables that affect the dependent variable such as: X1 which expresses the ratio of the US government debt to the gross domestic product, X2 is the global average of the price of oil in dollars, X3 represents the US inflation rate, X4 represents the rate of GDP growth, X5 is the US budget deficit, X6 represents the net flow Foreign direct investment to the United States of America. And that is assuming that the continuous increase in the federal budget deficit has an effect on the economic cycle in the United States of America, Depending on the World Bank data, time series data were obtained for thirty years from 1991 to 2020, and a unit root test was done and it was found that the variables (Y, X1, X2, X4, X5, and X6) are stable at the first difference and are not stable at the level while X3 was stable at the level, using the Augmented Dickey-Fuller Test statistic.

In large economies, the unemployment rate index is often used as a measure of the strength of the labor market, and it is also a useful indicator in forecasting the state of the economy. There is an inverse relationship between the unemployment rate and the country's economic activity in the long run. Increasing production requires increasing employment of the elements of production, including the labor force. Therefore, with increasing economic growth, employment increases, unemployment decrease, and vice versa. (CRS, 2020)

4. The economic cycle

The economic cycle is a fluctuation in the total economic activities of the state, and the economic cycle consists of several stages that fluctuate between economic recovery that occur simultaneously in many economic activities, followed by a general recession, a contraction, a recession, a recovery, and so on. An economic recession is a consecutive period of two consecutive economic quarters with a decrease in the rate of output growth. Another definition shows that an economic recession is a sustained decline in income, employment, and trade across various sectors of the economy. (Grigsby, 2017)

FIG. 1 Economic Cycle
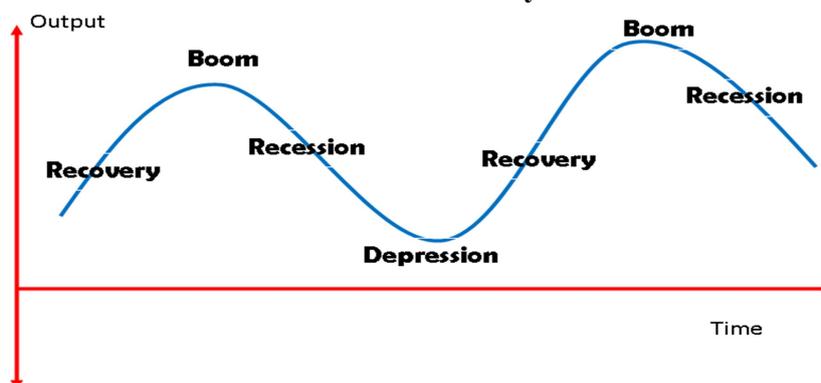
www.moneymatters101.com/financial-health/economic-cycles

Most of the recessions that followed the Second World War were driven by the Federal Reserve's desire to curb inflation, which led to a

rapid recovery once interest rates were lowered, while the 2008 recession was driven by inherently long-term financial factors, as it was found that unemployment rates after financial crises are no different from them in The state of cash crises (Cobion, Chenko, Koustas, 2013).

Economic activity shrinks as a result of the accumulation of large debts, either by crowding out private capital investment or by imposing an increase in distorted taxes or a decrease in public investment to facilitate repayment. In addition to the fact that the government bears the burden of high debts, it causes it to default on the due dates of the debt or interest, the consequent rise in interest rates, and thus the occurrence of inflationary waves as a result of the policies adopted to treat these imbalances (Yard, 2019). In times of economic boom, interest rates are generally high because individuals prefer to invest in stocks and more lucrative savings options rather than bonds that generally yield lower returns. Therefore, bond sellers should offer a higher rate of return, while in times of depression, interest rates are often low because individuals are risk averse and want a safe treasury bond, which enables the government to sell bonds at a lower rate of return. (Perry, 2014)

With the instability of the Pacific Alliance's opportunities in the United States of America, there was a kind of economic crisis at a rate of once every 40 years. Inflation accompanied by recession was found in the seventies due to OPEC's manipulation of oil prices in the global oil market. Also, there was a savings and loan crisis in the 1980s, where the oil depression weakened financial institutions in the oil-rich south, then a boom era in the 1990s thanks to the Internet, then the 2008 mortgage bubble burst, which led to a major economic downturn that affected the global economy, and now there is clear anxiety, and the increasing state of the US economy, the increasing budget deficit, and the government debt reaching unprecedented levels in 2020 and 2021 (Stuart, Lima, 2018).

The size of the government is only one of the factors that affect the burdens and benefits of government revenues and many spending

programs. For example, the public will be in a better position if the government relies on simple and not complicated taxes (Schuyler 2014). Although the year 2019 witnessed a growth rate of 2.61%, which may give the impression that there is no crisis in the US economy, this can be attributed to the increase in consumer demand due to the increase in liquidity that the US government has pumped into the market to get out of the economic recession. Therefore, the positive growth rate may not reflect a real recovery in the US economy, and what follows from the rest of the world, and that the US economy is heading towards a structural crisis, which makes things more difficult, especially due to the accumulation of global debt, which has reached an alarming rate (Abu-Ghazaleh, 2020). Monetary policy shocks lead to more persistent unemployment and more systematically than fiscal policy shocks, Which doubts the hypothesis that the different drivers of work cycles are the main explanation, and that the response of the changing monetary and fiscal policy is the main reason for one third of the continuous rise in unemployment rates and that two thirds of the rise in unemployment rates is unjustified (Cobion, Chenko, Koustas, 2013).

5. Analysis of research variables

5.1 Unemployment in the United States of America

The unemployment rate in the United States increased during the 2008 recession in October 2009, reaching 10%. Future recessions in the United States are likely to show a prolonged period in sluggish labor markets that will increasingly resemble the experience of many Western European countries in the 1980s (Cobion, Chenko, Koustas, 2013) . Cobion indicated that it may change the composition of the shocks that afflicted business owners. If the channels through which the shocks affect the economy differ according to the types of shocks, one may expect that some shocks will have continuous effects on the economy more than others. This is based on the view that financial crises have been historically associated with recessions.

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Fig. 2 Unemployment rate in the United States of America
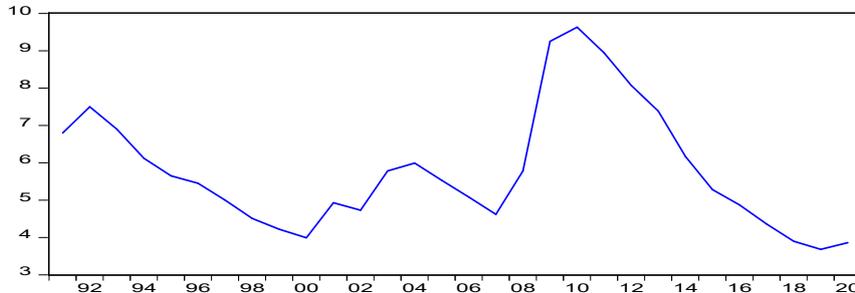
According to the data of the World Bank

Changes in the monetary policy response may have been severely restricted due to dealing with a zero nominal interest rate and due to an increasingly contractionary fiscal policy. Perhaps due to the change in the mechanisms of the shock spreading through the economy, this opinion means that the same shocks that generated a little continued unemployment in the economy of the eighties may now have longer-lasting effects (CRS, Reports, 2021).

The unemployment rate in the industrial sector reached 39%, at the government level 3.29%, and in the financial activities sector 3.1%. It was also noted that changes in unemployment rates for workers in the field of agriculture are not considered statistically significant. The fact that the subsidy provided as unemployment insurance represents an inevitable tax on work in the market may work to offset some of the stimulus effects associated with these policies and help explain the continuing high unemployment rate even after the end of the economic recession. The abstract labor market equilibrium theory indicates that the unemployment benefit provided by the state negatively affects the unemployment rate by influencing the decision of the individual looking for work, and also affects the decision of the employer, and that the effect of the benefits provided by the state to individuals in a state of unemployment extends to raising wages Equilibrium in the labor market, as it leads to a sharp contraction in job creation and an eventual rise in the unemployment rate (Hagedorn, Karahan, Manovskii , Mitanan, 2013).

5.2 The federal general budget

The federal general budget is a tool for the basic financial planning and control of the government, and it includes the spending plan proposed by the President as well as the general revenues of the state. Public revenues are cash sums received by the US government, and when the government increases revenues over expenditures, a surplus occurs in the state's budget, and a deficit is achieved if public expenditures exceed the state's public revenues. Noting that the proceeds from the government's acquired revenues are compared, and not necessarily the ones, with the expenditures incurred and not necessarily paid to obtain the net budget to indicate the deficit or surplus in the state's general budget (Treasury USA, 2018).

After decades of deficit in the federal budget, the budget in 1998 achieved surpluses in the following three years until 2001, due to the achievement of a sustainable economic growth rate in the history of America. The tax cuts in 2001 led to radical changes in the general budget forecasts in the short and long term. In 2004 the federal budget recorded a deficit of 412 billion dollars, 3.6% of GDP, while it achieved a surplus of 236 billion dollars, 2.4 billion dollars of the gross domestic product, while it was 127 billion dollars in 2001, increased by 1.3%. This shift from the surplus to the deficit in the federal budget expected for the next nine years reflects several dominant factors as there has become a decline in federal revenues. There is a cost to the 2001 tax exemption and economic growth reconciliation law - a ten-year tax cut of $ 1.35 trillion in a year. 2001 - There is also a cost to the Growth Tax Relief Settlement Act of 2003, which added half a trillion dollars and thus an increase in federal spending, especially on defense and homeland security (AARR, 2005).

In the last quarter of 2008, the United States of America lost nearly 7 million jobs, which is the largest quarterly decline since the end of World War II, and then this number exceeded in the next quarter when the US economy lost 2.1 million jobs, and by 2009 the unemployment rate rose to 14 The number of mortgaged homes increased

dramatically due to lower incomes and increased unemployment rate (OMB, 2011). When USA suffers from a deficit in the federal budget, it borrows and the debt accumulates if it is not paid over time, and the inability to repay leads to the counting of the ability to borrow more, raising interest rates, if confidence in the economy decreases, investment decreases and the unemployment rate increases (CED, 2016). With the collapse of financial markets in 2008, many Americans lost their jobs, the US economy shrank, and the US net wealth for the family sector decreased, starting from the third quarter of 2007 until the first quarter of 2009. These losses are estimated at $ 17.5 trillion, and credit markets also collapsed (OMB, 2011)

after the renewal of Keynesian thinking in the aftermath of the recession in 2009 to 2017, the debate about economic policy in 2010 in America became concerned with the effects of the fiscal deficit on economic performance, and the constant talk about the policy of severe austerity, which re-establish the sustainability of the economy and economic growth in the thirties of the last century. The policy of severe fiscal austerity necessitated, as follows, restoring confidence in the ability to reduce the deficit is a prerequisite for achieving balanced and sustainable growth, and without this confidence there will be no permanent growth and this is the lesson learned from the crisis (Taylor, Christian, Laura, Barbosa, 2012).

So , the US federal budget is in an unsustainable situation, and its impact on the rate of economic growth and the reduction of domestic savings as a result of reducing taxes and thus reducing domestic investment and the consequences of reducing taxes from a rise in domestic interest rates and thus reducing investment and thus increasing unemployment rates and incomes in the stage of economic recession, as well as the attempt to increase borrowing to finance the budget deficit in addition to financing the deficit and increasing printing money to finance the budget deficit and the resulting high inflation rates (Robert, Rubin, Sinai,2004).

The United States of America is on a path that is not financially sustainable, due to the policies that have been followed, especially the

Trump period, by increasing public spending, especially on health care and social security (Min, Kim, Moussawi, 2016) Also, large government deficits automatically lead to lower private investment and economic growth. (Taylor, Christian, Carvaho, Barbosa, 2012)

Fig.3 The federal general budget

According to the data of the World Bank

But for how long is deficit financing used to finance government bonds? And for when is the budget deficit sustainable? A sustainable deficit can be achieved when additional government bonds can be issued when the maturity date of the current bonds comes until the real rate of inflation adjusted for government bonds becomes smaller than the rate of economic growth, and here the identity model of national domestic savings financed by bonds can be implemented continuously without problems. As for the unsustainable deficit, it is the deficit that explodes and cannot be financed by issuing new future bonds, as local and foreign investors refuse to absorb a greater part of the public debt, and this occurs when the interest rate on the debt has exceeded the rate of economic growth of the state, and here the state cannot achieve a sustainable deficit (Steven, 2010).

5.٣ US Federal Government Debt

The US federal government debt after World War II was about 113% in 1945, and then declined over the next 30 years until 1975. in 2013 it amounted to about 73%, which is equivalent to 12.3 trillion dollars, and government holdings amounted to 4.9 trillion dollars or 29%, as

the share of China reached 1.2 trillion dollars and Japan 1.2 trillion dollars (Min , Kim, Moussawi, 2016). The US government debt reached its lowest levels in the mid-seventies, then took an upward path until it reached in 2020 a level unprecedented since World War II, due to the expansion of government spending, and in particular the compulsory spending programs on social security, at an increase rate of 24%. While public revenues increased, for example, at a rate of .016%, and in reality it is not the United States of America alone. In France and Germany as well, the increase in public revenues did not keep pace with the rate of increase in the rates of public spending of the state (Yard, 2019).

The US federal government debt is proceeding at an unsustainable pace, as it reached in 2007 about 65% of the gross domestic product and then reached 102% in 2013, and the US Congressional Budget Office predicted that the federal debt will grow by 300% by 2037 if the US government continues on the same Policies. Therefore, there is an urgent and necessary need to take a set of strong measures to return America to the natural and sustainable budget path. The total US public debt consists of two basic items: debt owned by the public and debt owned by government accounts or internal debt, debt held by the public, such as treasury bonds held by investors outside the federal government, including those owned by individuals and companies, as well as local governments And foreign Domestic debt or government debt, such as non-marketable treasury papers, deposited in accounts run by the federal government owed to program beneficiaries, such as the Social Security Trust Fund. Debt in government accounts represents cumulative surpluses including interest earnings from accounts that have been invested in Treasury bills (Min Kim, Moussawi, 2016).

Also, the interest paid on the US government debt leads to a decrease in the flexibility of the US public budget due to the contradictory increase in government spending (ECLAC, 2019). The US debt was distributed in 2011 as follows: 16% social security fund, 12% federal reserve, 13% other federal government, 6% mutual funds, 8% China, 7% Japan, 19% other foreign nations, 16% all other . Accordingly,

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Standard & Bones agency downgraded the US credit rating from AAA to AA + in August 2011, as this is the first time that the US government has been granted a grade lower than the first rating. S&P also announced a negative outlook, after the 112th US Congress voted to raise the US government debt ceiling (Min, Kim, Moussawi, 2016).

Among the challenges facing the United States of America is the federal debt that the public maintains with a percentage of the gross domestic product, as it reached its highest level at the beginning of 2008, and despite the scrutiny towards the fiscal balance in 2014, at that time the financial expectations were not optimistic, and those expectations were believed after That is where the financial crisis became evident in the years following 2014 and, for example, the CBO, which is the General Budget Office in the US Congress, has predicted the annual deficit will shrink for two years and then start to rise, to actually rise to 150% of GDP in a year 2023 (Peter , Edward , , 2015).

The borrowing of the US government was limited at the beginning of 2010, and private borrowing in the United States has been affected differently by the government creditworthiness of the United States and therefore it can be said that the United States suffered from a general debt crisis at a time when European countries suffered from a private debt crisis (Arellano, Atheson, Wright, 2015).

The US federal debt exceeded $ 22 trillion in February 2019, although it reached 54% of GDP in 2001, and reached 104% by the end of 2018 .The TBAC Treasury Borrowing Advisory Committee of the Securities Industry Association (SIFMA) warned that the debt trend The escalating year may cause a large financing gap and fall into a financial crisis that leads to an economic recession. IBAC also forecast that the United States will need more than $ 12 trillion in bonds over the next decade, even if an economic recession does not trigger (ECLAC, 2019).

Fig 4 US Federal Government Debt
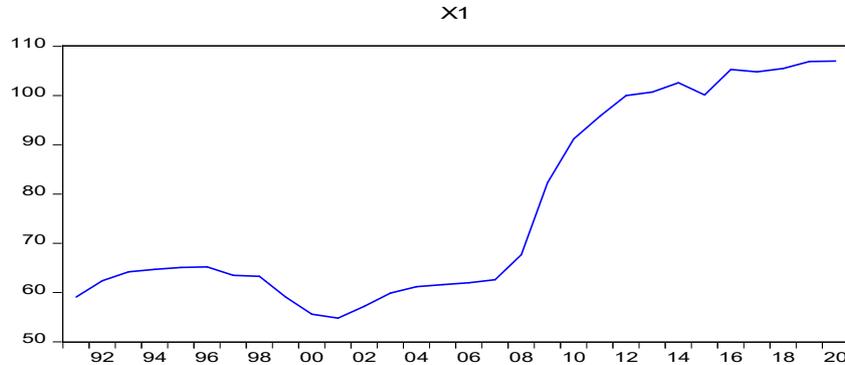
There is a correlation between the federal budget deficit and the government public debt, as the budget deficit leads to an increase in the federal government debt, which in turn leads to an increase in the federal budget deficit in the future. The nature of the relationship between the budget deficit and debt varies according to the type of debt - consumer or productive - and the budget deficit is the main reason for the increase in government debt (CRS, 2019). The following model clarifies the significance of each of the *X1* and *X5*

D(Y) = -0.359490421659 + 0.126297778669*D(X1) - 0.1237550543*D(X5)

The previous model is significant at α = 5%, each explanatory variable separately is significant at α = 5%, the coefficient of determination is 54%, meaning that 54% of the changes in the Y variable are caused by the independent variables and 46% are due to other factors not taken into account. D (X1) by one unit leads to a change in D (Y) by about 0.13%, Changing the variable D (X5) by one unit leads to a change in D (Y) by about 0.13% as well. Also, the model does not suffer from self-correlation using the Breusch-Godfrey Serial Correlation LM Test, as well as the model does not suffer from the variability instability using the Heteroskedasticity Test White, and the rest

follows the normal distribution with a significance level of%
according to the Histogram Normality Test.

Table 1

Dependent Variable: D(Y)
Method: Least Squares
Date: 02/06/21   Time: 22:16
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.359490	0.130498	-2.754754	0.0106
D(X1)	0.126298	0.034618	3.648347	0.0012
D(X5)	-0.123755	0.046166	-2.680636	0.0126

R-squared	0.535848	Mean dependent var	-0.101379
Adjusted R-squared	0.500144	S.D. dependent var	0.904622
S.E. of regression	0.639572	Akaike info criterion	2.041662
Sum squared resid	10.63536	Schwarz criterion	2.183106
Log likelihood	-26.60410	Hannan-Quinn criter.	2.085961
F-statistic	15.00809	Durbin-Watson stat	1.431873
Prob(F-statistic)	0.000046		

Estimation Equation:
=========================

D(Y) = C (1) + C (2)*D(X1) + C (3)*D(X5)

E- Views output

The researcher also made another model, as the results of which
resulted in the following equation

$$Y = 4.381 \quad -.141 X5 + 0.108 X5^2 + 0.007 X5^3$$

The previous model is significant at α approaching 0%, each
explanatory variable separately significant at α approach 0% the
determination coefficient is 70.6%, meaning that 70.6% of the
changes in the variable Y are caused by the independent variable. The

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deficit of the US public budget X5, 29.6% is due to other factors not taken into account, at X5 = 0, the unemployment value is 5.569%, and with the increase in the budget deficit, unemployment decreases and reaches Zero when X = -18.39%, increasing the budget surplus leads to an increase in unemployment at an increasing, fluctuating rate.

Table 2

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.840	.706	.672	.931

The independent variable is X5.

Table 3

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	54.084	3	18.028	20.780	.000
Residual	22.557	26	.868		
Total	76.640	29			

The independent variable is X5.

Table 4

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
X5	-.141	.125	-.325	-1.129	.269
X5 ** 2	.108	.028	3.290	3.850	.001
X5 ** 3	.007	.001	3.463	5.107	.000
(Constant)	4.381	.262		16.696	.000

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The researcher has also studied the factors affecting the US public budget deficit, Whereas the dependent variable Y is the US federal budget deficit, X1 is the federal debt rate as a percentage of US GDP, X2 is the global average for the price of oil, X3 is the inflation rate, X4 is the GDP growth rate, X5 is the unemployment rate In the United States, the X6 is the net inflows of foreign direct investment into the United States of America, which resulted in:

$$D(Y) = -0.552955464507 + 0.470626162843*D(X4) - 1.49113591592*D(X5)$$

Estimation Equation:

$$D(Y) = C(1) + C(2)*D(X4) + C(3)*D(X5)$$

the previous model was significant at $\alpha = 5\%$, each explanatory variable separately was significant at $\alpha = 5\%$, the coefficient of determination 38%, meaning that 38% of the changes in the Y variable were caused by the independent variables and 62% due to other factors not taken into account. Change of variable D (X4) by one unit causes D (Y) to change by 0.471%, change of variable D (X5) by one unit leads to change of D (Y) by 1.491%, the model does not suffer from autocorrelation using Breusch- Godfrey Serial Correlation LM Test, the model does not suffer from variability instability using the Heteroskedasticity Test White, the residues do not follow the normal distribution at a 1% significance level according to the Histogram Normality Test

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Table 5

Dependent Variable: D(Y)
Method: Least Squares
Date: 02/15/21   Time: 00:43
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.552955	0.423170	-1.306698	0.2028
D(X4)	0.470626	0.255806	1.839777	0.0772
D(X5)	-1.491136	0.482906	-3.087838	0.0048

R-squared	0.379066	Mean dependent var	-0.400000
Adjusted R-squared	0.331302	S.D. dependent var	2.768187
S.E. of regression	2.263656	Akaike info criterion	4.569536
Sum squared resid	133.2275	Schwarz criterion	4.710981
Log likelihood	-63.25828	Hannan-Quinn criter.	4.613835
F-statistic	7.936210	Durbin-Watson stat	1.280688
Prob(F-statistic)	0.002040		

The second model also resulted in the following equation:

$$Y = -٧٣.٧٣٨ + ٤.٢٢٩ \, X5 - 5.1316 \, X5^2 + 0.237 \, X5^3$$

The previous model is significant at α approaching 0.2%, each explanatory variable separately significant at α approach 6.8%, the coefficient of determination is 42.4%, meaning that 42.4% of the changes in the variable Y are caused by the independent variable and 56.6% are due to other factors not taken into account. , When X5 = 11.387%, the value of the budget deficit is 0%, and there is a direct relationship between the unemployment rate and the balance of the budget, with increasing unemployment, the budget surplus increases and the appropriate limit for unemployment decreases by 4%, which leads to a reduction of the deficit to -3.83%, after that the reduction of labor by 1% for him Bad effects as a result of the exacerbation of the deficit by an increasing amount, as the unemployment rate reaches 0% causes an increase in the budget deficit to -73.738%.

Table 6

Dependent Variable: D(Y)
Method: Least Squares
Date: 02/15/21   Time: 01:45
Sample (adjusted): 1992 2019
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.115602	0.300521	0.384672	0.7048
D(X1)	-0.118805	0.086669	-1.370794	0.1864
D(X2)	0.015321	0.017371	0.881987	0.3888
D(X3)	0.040765	0.099113	0.411304	0.6855
D(X4)	0.155811	0.161662	0.963811	0.3472
D(X5)	-1.104670	0.372845	-2.962814	0.0080
D(X6)	0.147821	0.486450	0.303877	0.7645

R-squared	0.691843	Mean dependent var		0.015385
Adjusted R-squared	0.594530	S.D. dependent var		1.887367
S.E. of regression	1.201810	Akaike info criterion		3.430339
Sum squared resid	27.44261	Schwarz criterion		3.769057
Log likelihood	-37.59441	Hannan-Quinn criter.		3.527878
F-statistic	7.109465	Durbin-Watson stat		2.268826
Prob(F-statistic)	0.000437			

5.4 The rate of economic growth

The relationship between the federal budget deficit and growth is more complex, as the deficit in the federal budget was compensated by the influx of foreign savings into the American economy, and with the decrease in those savings the US economy was affected, and this appeared in the form of the high unemployment rate and the decrease in the economic growth rate. Some economists expect that the federal budget deficit will lead to a decrease in asset prices and thus a decrease in the US national wealth and a decrease in financial flexibility to deal with macroeconomic shocks, and thus a decline in investor confidence in the US economy (Roy, 2009).
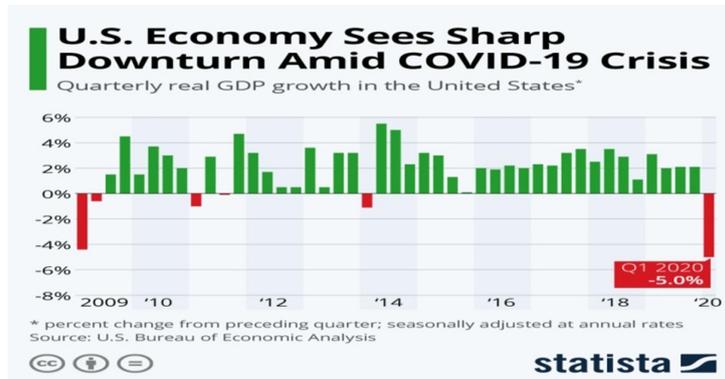
Fig. 5

6. US Federal Reserve policies in treating the crisis

Since the late seventies, global government debt has been a major factor in the rise in real interest rates, especially in the United States of America, which had a great impact on real interest rates in other countries - a negative impact on the economy of other countries - as well as the impact of higher real interest rates on economic growth rates. In countries with large government debt and whose economy is linked to the US economy. Debt growth rates exceeded the real growth rates in the economy (Ford, Laxton, 2020). Successful financial control depends mainly on reducing public spending, as the main reason for the problem of the state's public budget deficit is insufficient US revenues. Therefore, successful financial control in America must include an increase in revenues because achieving high economic growth is a necessary condition for financial sustainability public revenues, at the same time reducing the public expenditures of the state. The United States of America, as a country with a presidential system, with a government frequently divided, makes it difficult to deal with financial imbalances. Also, the accumulation of government debt, especially in recent years, especially after the Corona pandemic, makes the United States of America face a great challenge. Going back to the eighties, we find that the approach taken to overcome financial imbalances was comprehensive cuts in public

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spending (Eichengreen, Fedman, Liebmay, 2020). In 2018, non-government debts were $ 58 trillion unpaid and stemming from government borrowing from each other and represent treasury debt held by government accounts including the Social Security Fund of $ 2.9 trillion and the Medicare Exceptional Funds of $ 301 billion. Non-government debt is mainly held in government trust funds in the form of private securities that are not marketable by various parties of the government (Treasury USA, 2018).

And the US federal government is the main player, as it collects only about two-thirds of total government revenue, while the United States and local governments receive the rest. The main difference between levels is that while the federal government can easily sell treasury bonds to finance their deficits, states and localities must - to a large extent - covering current expenditures with current revenues, and thus the federal government plays a major role in determining the trends and cycles of the US public finances (Taylor, Christian, Barbosa, 2011). The major shifts in US fiscal policy were represented in the public expectations shifting from demanding a balanced budget to obtaining the federal budget instead, in order to enhance economic security at the microeconomic level, economic capacity at the macroeconomic level, and the federal government became more professional. This shift has led to an increase in demand on the spending side of the federal budget while creating common problems regarding taxes and appropriations through a series of legal milestones. The combined effect was the exertion of great and continuous pressure to increase public expenditures *(Peter, Edward, 2015).*

The recent legislative deals in Washington focused on how to solve the short-term deficit in the state budget - 10 years - as the main drivers of the most important structural deficit were systematically ignored. The US debt crisis is likely to result in the failure of the debate in the United States of America to realize that the burden of fulfilling the rising government debt has already contributed to the realization of the recent decline in the economic competitiveness of the United States of America (Kaplan, Walker, 2014).

With the US economy recovering from the 2008 financial crisis, achieving an unemployment rate of less than 5%, an inflation rate of less than 2%, and the stock market reaching its highest levels, there was concern that the US government debt would reach unprecedented numbers - $ 20 trillion- 106% of GDP. This raised concern and the possibility of the US economy derailing its course, as well as its impact on the rest of the world and the global economy. The reasons for this concern can be crystallized in that the US public budget deficit continues; tax cuts in the republican system, reduced revenues, and consequently a successive increase in the budget deficit in the coming years, which has already been achieved (Stuart, Lima, 2018).   This in addition to the increase in military spending, medical and health care during the Trump era, as well as the Corona pandemic, all of which contributed to the US economy derailing its course, not to mention the external threats represented in the fierce competition by the Chinese economy for the leadership of the world economically.

The Federal Reserve concluded that what its monetary policy indicated should start due to the improvement in the labor market and other macroeconomic conditions, at a time when the debt burden has already reached a worrying level because the US public debt exceeded 60% of the gross domestic product, reaching 73.6% 2015 year *(CED, 2016)*. Many economists agree that the Federal Reserve made several mistakes in managing US monetary policy in 1929, 1937 when it worked to reduce the money supply to curb inflation by absorbing excess reserves, which deepened the problems of the Great Depression (Price, 2010).

7. The necessity of US financial sustainability

Fiscal sustainability is the policy in which the ratio of federal debt to GDP is stable or declining in the long run, and reports indicate that the US fiscal policy is not sustainable, and it is certain that the US fiscal policy will not continue with its current policy and the delay in changing it will lead to an increase in the public budget deficit. The expected increase in government debt will also lead to a 20% delay in reform if the change is delayed for ten years and to 46% if the change

is delayed to 20 years (Treasury USA, 2018*).* According to the study, projections show that the debt-to-GDP ratio will exceed 100% by 2030, and although the debt-to-output ratio decreased 4% in 2017, it increased again in 2018 (United States Government, 2018). Therefore, the need is urgent to make the US fiscal policy sustainable.

8. The difference in economic thought according to the president's affiliation

The economic recession in the 1970s led to a change in fiscal policies, as in 1982 President Reagan introduced changes to Social Security due to the high costs of his program, and the result was a relatively large increase in taxes to cover retirement expenses as well as a baby boom. The budget deficit in 1980 was about 2.75%, while in 1983 it was 6%, while it reached 3.2% in 1987. Moreover military spending doubled in the period from 1980 to 1988 due to the arms race with the Soviet Union (Perry, 2014). In the year 2000, taxes were cut during the Bush era, followed by a decrease in government saving, a reduction in public saving, which led to higher interest rates, which led to a decrease in investment and thus high unemployment rates and a slowdown in the rate of economic growth. During the Trump era of 2018, it was pledged that the government is an agent of taxpayers' money and not an owner of it, and this means that the financial responsibility and prioritization of the most effective programs until now led to the administration's focus on health, which led to the cancellation of 22 costly regulations for each new system that was established, and this represents taking out the federal government through the private companies system that made America the biggest power. The tax law was largely rewritten more than 30 years ago to the American people, and the tax law was corrected to restore the US economy the right way by correcting the taxpayers' position in front of the federal government (OMB, 2019)

9. The impact of the US economy on the global economy

The US economy represents about 25% of the global economy, with about $ 20 trillion. According to the expectations of American banks,

led by GB Morgan, of the occurrence of a recession crisis in America, in addition to a decrease in the rate of economic growth, as well as an increase in the interest rate by up to 3.5%, which works to reduce investment rates and thus increase unemployment rates and the entry of the US economy in Recession .Consequently, the economies of the US economy were affected, the crisis spread and the increase in unemployment rates to the countries of Europe and then to the rest of the world, and the entry into a foreign political crisis as well as a trade war with China and the fear of a political and economic stagnation such as what happened in 1973, 1979, 1990 and in the end expected a huge rise In oil prices (Abu-Ghazaleh ,2020). Therefore, any economic event that occurs in America will have an impact on the exports of other countries of the world, and therefore it is not surprising that the American economic problems are reflected in the global economy, where losses occur in banks' assets, especially those related to loans, investments, mortgage bonds, low stock prices, as well as a slowdown in growth rates. Economic, which is reflected in the decline in demand for oil and the decline in its prices, as well as the possibility of a global economic recession and the occurrence of instability and volatility in the global financial markets.

Also, due to the magnitude of the US debt, any shake-up in the US economy will cause a crisis in the global economy. Therefore, the issue of the US government debt is a global issue that has implications for the entire global economy, not the US economy alone, which makes attention to this issue a global concern and one of the main issues in international studies. And that every action involving US bonds will have an impact on the global economy (Zikun, 2014).For example, in Canada, the public budget deficit appeared as a major financial challenge facing the Canadian government, despite the passage of more than a decade after the 2008 recession in the United States of America, which affected Canada like the rest of the world, and despite this Canadian debt continued to rise for both the federal government and many regional provinces Canadian. Although Ottawa managed the deficit in a stable manner, provinces such as Alberta, Mantua and Ontario did not succeed with stable budget (Fuss, Palaceios, 2020).

Financial assets among the OECD countries also continued to stabilize in the wake of the 2008 international financial crisis, with a continued decline to control the financial budget deficit of the OECD countries. On the other hand, the largest fiscal deficit was in Greece, at 5.9%, and growth continued to falter, as well as Spain, with a deficit of about 5.1%, and Portugal, at 4.4%. It is important for the government to fulfill its obligations without incurring additional debts in addition to the net interest payments for debt servicing, which form an inelastic part of the state's budget (OECD, 2017).

Finally, global debt increased by 30% between 2007 and 2017, and the real interest rate on public debt decreased by about 200 basis points, although expectations were for a rise of 100 basis points, and this means that the demand for public debt increased at a greater rate than supply. The question now is where did these savings come from? If we look at saving and private investment at the level of the world, we find that the global investment rate has increased slightly during that period، with a major shift in investment in China, where the rate of investment in China reached about 6% in 2007 and then jumped to 12% in 2017. The world has witnessed a great fluctuation in the international economic forces during the period from 2007 to 2017, where the Chinese saving rate increased less than Chinese investment, and the US saving rate increased more than US investment. The increase in the global saving rate came from heavily indebted countries before 2007, most of which were from the United States of America and southern Europe (Ragot, Pinois, 2019).

10. Results

It was evident from the standard model that the federal budget deficit affected the state of economic recession in the United States of America by more than **70%**. It also became clear that the relationship is reciprocal, as the state of economic recession in the United States of America affected the increase in the federal budget deficit by **38%**. When government spending exceeds government revenues and there is a successive deficit, it will ultimately lead to high levels of debt and thus higher interest payments on it. Although the US federal

government has made great progress represented in the interest in health care and social security, it faces a great challenge in the necessity of reducing public spending, improving the efficiency of operations and increasing the state's public revenues. No country, whatever its progress, can continue to face a continuous financial deficit that significantly exceeds its growth economic. The inability of the federal government to restore the financial balance may directly reduce the confidence of businessmen and consumers, which discourages investment, which exacerbates the financial imbalances, which leads to concern on the part of American traders, investors and creditors that the US government. It may resort to increasing the inflation rate to reduce the real value of the government debt. And US financial imbalances may lead to a loss of confidence among participants in the foreign exchange and international credit markets.

Also, the US government debt may not show its negative effects in the short term, but it is a long-term threat, and it may cause a financial crisis whose effects are transmitted to the rest of the world theoretically due to the dependence of their economies on the US economy, which costs the global economy a lot of losses that result from US policies that it is being followed, therefore, who is paying the bill for financial reforms is not the United States alone, but the global economy as a whole. Countries more independent of the United States, the economic crisis is less severe, and the economy that is more related to the US economy is affected a lot. If it is theoretically assumed that the United States of America may not be able to pay the government debt, then the collapse of the American financial markets, and consequently the collapse of global financial markets, may result.

11. Conclusion

In the seventies, the US federal debt ranged between 25% to 30% of GDP, while in the 1980s, due to lower taxes and increased public spending - especially military spending - as well as high interest rates, the US federal debt ratio increased to 50% of output. The gross domestic product with the economic recession in 2008, the percentage increased to 70% of the US gross domestic product. In August 2011,

the downgrade of the credit rating was the first sovereign rating with a negative outlook in the history of the United States of America, and the US economy has been suffering since then from an economic recession. A ceiling was set for the US debt, as the risk was sensed by the US administration. Therefore, the Federal Budget Control Act was issued in 2011, and limits for discretionary spending were also set (William, 2014).

The sovereign debt restructuring fund reached 3 basic conclusions. The first is that the US federal government cannot maintain the path of domestic debt, which poses serious risks to the US economy, and the second is that policy makers must take decisive and courageous decisions to arrange the federal budget, and the third is that Any realistic solution must include entitlement structural reforms and fundamental tax reforms that will generate new revenues. Congress also approved these plans in law, and in particular the maximum limits for annual appropriated spending included in the 2011 General Budget Control Act, but the 2011 law failed to achieve the full measure of the savings required in the other components of the budget (CRS, 2019).

12. Recommendations

There is an urgent need to reduce the federal budget deficit. Reducing the ratio of public debt to gross domestic product requires a necessary condition, which is an increase in gross domestic product, which in turn depends on the necessity of a strong economic recovery, and high inflation rates bear the creditors bearing the burden of US inflation. The US state budget deficit can be bridged by the Federal Reserve instead of borrowing to the public by buying the debt by the Federal Reserve and pumping currencies from the dollar, which results in high inflation rates and thus higher interest rates, which often makes the preference for selling to the public in order to preserve inflation rates at their safe rates, which requires coordination between monetary policy and fiscal policy, the goal of increasing economic growth can be achieved by using the deficit financing policy without the occurrence of monetary problems due to the effect of competition and the occurrence of inflationary waves.

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Attachments

Dependent Variable: D(Y)
Method: Least Squares
Date: 02/06/21   Time: 21:36
Sample (adjusted): 1992 2019
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.165473	0.146979	-1.125825	0.2736
D(X1)	0.055059	0.043553	1.264180	0.2207
D(X2)	0.001314	0.008287	0.158550	0.8756
D(X4)	0.007051	0.083400	0.084545	0.9335
D(X5)	-0.306742	0.092879	-3.302587	0.0036
D(X6)	-0.159479	0.223136	-0.714716	0.4830

R-squared	0.672346	Mean dependent var		-0.082692
Adjusted R-squared	0.590432	S.D. dependent var		0.949309
S.E. of regression	0.607534	Akaike info criterion		2.040358
Sum squared resid	7.381956	Schwarz criterion		2.330688
Log likelihood	-20.52465	Hannan-Quinn criter.		2.123962
F-statistic	8.207990	Durbin-Watson stat		2.138205
Prob(F-statistic)	0.000238			

```
* Curve Estimation.
TSET NEWVAR=NONE.
CURVEFIT
  /VARIABLES=Y WITH X5
  /CONSTANT
  /MODEL=CUBIC
  /PRINT ANOVA
  /PLOT FIT.
```

Notes

Output Created		02-FEB-2021 01:47:38
Comments		
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	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	30

Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Cases with a missing value in any variable are not used in the analysis.
Syntax		CURVEFIT /VARIABLES=Y WITH X5 /CONSTANT /MODEL=CUBIC /PRINT ANOVA /PLOT FIT.
Resources Use	Processor Time	00:00:00.25
	Elapsed Time	00:00:00.22
	From	First observation
	To	Last observation
Predict	From	First Observation following the use period
	To	Last observation
Time Series Settings (TSET)	Amount of Output	PRINT = DEFAULT
	Saving New Variables	NEWVAR = NONE
	Maximum Number of Lags in Autocorrelation or Partial Autocorrelation Plots	MXAUTO = 16
	Maximum Number of Lags Per Cross-Correlation Plots	MXCROSS = 7
	Maximum Number of New Variables Generated Per Procedure	MXNEWVAR = 60
	Maximum Number of New Cases Per Procedure	MXPREDICT = 1000
	Treatment of User-Missing Values	MISSING = EXCLUDE

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Confidence Interval Percentage Value	CIN = 95
Tolerance for Entering Variables in Regression Equations	TOLER = .0001
Maximum Iterative Parameter Change	CNVERGE = .001
Method of Calculating Std. Errors for Autocorrelations	ACFSE = IND
Length of Seasonal Period	Unspecified
Variable Whose Values Label Observations in Plots	Unspecified
Equations Include	CONSTANT

Model Description

Model Name		MOD_3
Dependent Variable	1	Y
Equation	1	Cubic
Independent Variable		X5
Constant		Included
Variable Whose Values Label Observations in Plots		Unspecified
Tolerance for Entering Terms in Equations		.0001

Curve Fit

Case Processing Summary

	N
Total Cases	30
Excluded Cases[a]	0
Forecasted Cases	0
Newly Created Cases	0

a. Cases with a missing value in any

variable are excluded from the analysis.

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Variable Processing Summary

		Variables	
		Dependent	Independent
		Y	X5
Number of Positive Values		30	4
Number of Zeros		0	0
Number of Negative Values		0	26
Number of Missing Values	User-Missing	0	0
	System-Missing	0	0

Y
Cubic
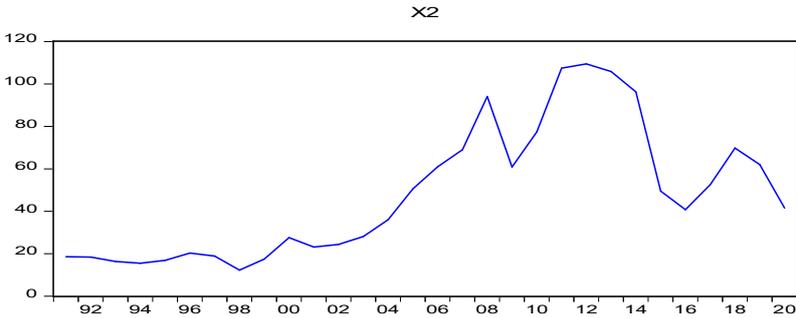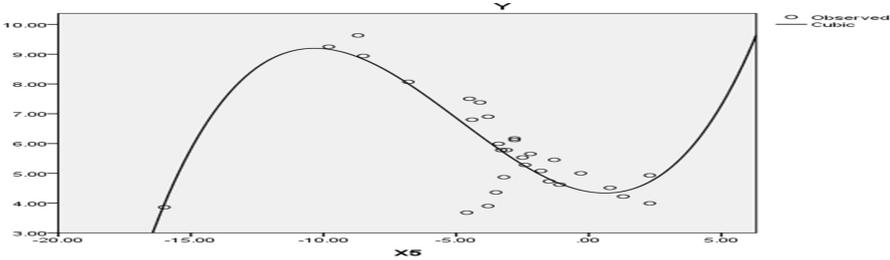
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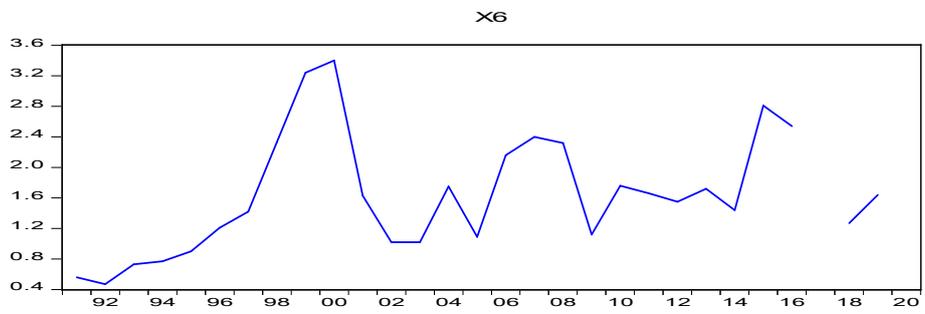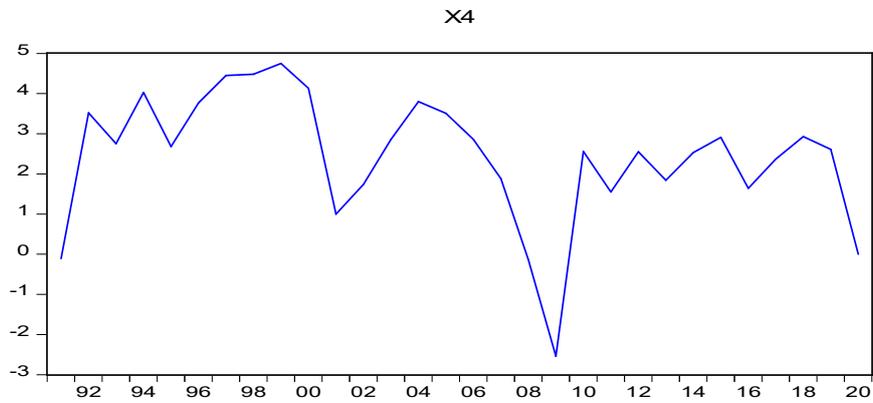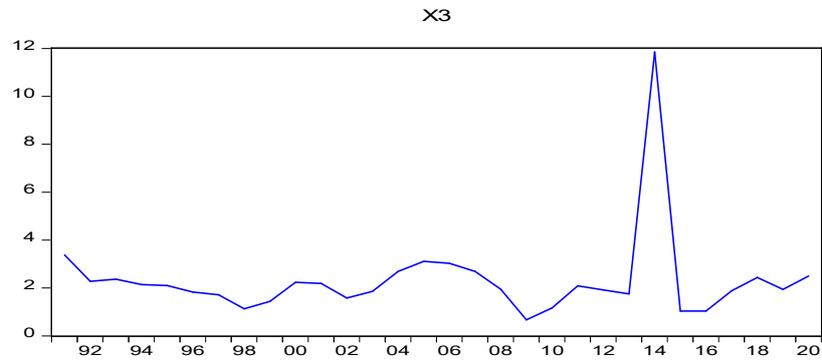
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	Y	X1	X2	X3	X4	X5	X6
Pearson Correlation	1	.093	.399*	-.020	-.332	-.458*	-.188
Sig. (2-tailed)		.625	.029	.916	.073	.011	.329
N	30	30	30	30	30	30	29
Pearson Correlation	.093	1	.628**	.127	-.256	-.573**	.287
Sig. (2-tailed)	.625		.000	.504	.172	.001	.131
N	30	30	30	30	30	30	29
Pearson Correlation	.399*	.628**	1	.258	-.342	-.399*	.029
Sig. (2-tailed)	.029	.000		.168	.065	.029	.881
N	30	30	30	30	30	30	29
Pearson Correlation	-.020	.127	.258	1	.032	.041	-.048
Sig. (2-tailed)	.916	.504	.168		.867	.829	.806
N	30	30	30	30	30	30	29
Pearson Correlation	-.332	-.256	-.342	.032	1	.560**	-.013
Sig. (2-tailed)	.073	.172	.065	.867		.001	.945
N	30	30	30	30	30	30	29
Pearson Correlation	-.458*	-.573**	-.399*	.041	.560**	1	-.023
Sig. (2-tailed)	.011	.001	.029	.829	.001		.907
N	30	30	30	30	30	30	29
Pearson Correlation	-.188	.287	.029	-.048	-.013	-.023	1
Sig. (2-tailed)	.329	.131	.881	.806	.945	.907	
N	29	29	29	29	29	29	29

*. Correlation is significant at the 0.05 level (2-tailed).

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

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Cointegration

Date: 02/02/21 Time: 01:23
Sample (adjusted): 1993 2020
Included observations: 28 after adjustments
Trend assumption: Linear deterministic trend
Series: Y X1 X5
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.586442	36.83104	29.79707	0.0066
At most 1	0.349961	12.10823	15.49471	0.1518
At most 2	0.001712	0.047968	3.841466	0.8266

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.586442	24.72281	21.13162	0.0149
At most 1	0.349961	12.06026	14.26460	0.1084
At most 2	0.001712	0.047968	3.841466	0.8266

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

Y	X1	X5
1.058480	0.029099	-0.088336
0.759771	-0.035234	0.348471
0.911621	0.072877	0.970103

Unrestricted Adjustment Coefficients (alpha):

D(Y)	-0.324339	0.044647	-0.025261
D(X1)	0.481220	-0.141533	-0.116236
D(X5)	0.866630	1.247251	0.042158

The reflection of the federal budget deficit on the economic cycle in the United States of America

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1 Cointegrating Equation(s):	Log likelihood	-143.2199	

Normalized cointegrating coefficients (standard error in parentheses)

Y	X1	X5
1.000000	0.027492	-0.083456
	(0.01220)	(0.13127)

Adjustment coefficients (standard error in parentheses)

D(Y)	-0.343306
	(0.14850)
D(X1)	0.509362
	(0.62868)
D(X5)	0.917310
	(0.54121)

2 Cointegrating Equation(s):	Log likelihood	-137.1897	

Normalized cointegrating coefficients (standard error in parentheses)

Y	X1	X5
1.000000	0.000000	0.118307
		(0.12295)
0.000000	1.000000	-7.339058
		(3.91952)

Adjustment coefficients (standard error in parentheses)

D(Y)	-0.309384	-0.011011
	(0.18239)	(0.00640)
D(X1)	0.401829	0.018990
	(0.77292)	(0.02711)
D(X5)	1.864935	-0.018727
	(0.57359)	(0.02012)

Dependent Variable: D(Y)
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 02/02/21   Time: 01:18
Sample (adjusted): 1993 2020
Included observations: 28 after adjustments
D(Y) = C(1)*(Y(-1) + 0.0274917010588*X1(-1) - 0.0834556984771*X5(-1) - 8.18653981517) + C(2)*D(Y(-1)) + C(3)*D(X1(-1)) + C(4)*D(X5(-1)) + C(5)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.343306	0.148496	-2.311887	0.0301

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C(2)	0.145796	0.266390	0.547302	0.5894
C(3)	0.126699	0.103825	1.220317	0.2347
C(4)	-0.065302	0.151619	-0.430696	0.6707
C(5)	-0.330515	0.234047	-1.412174	0.1713

R-squared	0.430294	Mean dependent var	-0.130000
Adjusted R-squared	0.331214	S.D. dependent var	0.907753
S.E. of regression	0.742354	Akaike info criterion	2.402451
Sum squared resid	12.67506	Schwarz criterion	2.640345
Log likelihood	-28.63432	Hannan-Quinn criter.	2.475178
F-statistic	4.342918	Durbin-Watson stat	1.945112
Prob(F-statistic)	0.009213		

Vector Error Correction Estimates
Date: 02/02/21   Time: 01:17
Sample (adjusted): 1993 2020
Included observations: 28 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
Y(-1)	1.000000
X1(-1)	0.027492
	(0.01220)
	[2.25410]
X5(-1)	-0.083456
	(0.13127)
	[-0.63576]
C	-8.186540

Error Correction:	D(Y)	D(X1)	D(X5)
CointEq1	-0.343306	0.509362	0.917310
	(0.14850)	(0.62868)	(0.54121)
	[-2.31189]	[0.81020]	[1.69491]
D(Y(-1))	0.145796	1.179235	0.129937
	(0.26639)	(1.12781)	(0.97090)
	[0.54730]	[1.04560]	[0.13383]
D(X1(-1))	0.126699	0.004805	-0.344532
	(0.10382)	(0.43956)	(0.37840)

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	[1.22032]	[0.01093]	[-0.91049]
D(X5(-1))	-0.065302	-0.528992	0.132399
	(0.15162)	(0.64190)	(0.55260)
	[-0.43070]	[-0.82410]	[0.23960]
C	-0.330515	1.712277	0.192876
	(0.23405)	(0.99088)	(0.85302)
	[-1.41217]	[1.72804]	[0.22611]
R-squared	0.430294	0.400208	0.214946
Adj. R-squared	0.331214	0.295896	0.078414
Sum sq. resids	12.67506	227.1884	168.3681
S.E. equation	0.742354	3.142890	2.705615
F-statistic	4.342918	3.836655	1.574334
Log likelihood	-28.63432	-69.04033	-64.84555
Akaike AIC	2.402451	5.288595	4.988968
Schwarz SC	2.640345	5.526489	5.226862
Mean dependent	-0.130000	1.592857	-0.410714
S.D. dependent	0.907753	3.745509	2.818371
Determinant resid covariance (dof adj.)		10.03913	
Determinant resid covariance		5.564234	
Log likelihood		-143.2199	
Akaike information criterion		11.51570	
Schwarz criterion		12.37212	
Number of coefficients		18	

Dependent Variable: D(Y)
Method: Least Squares
Date: 02/06/21   Time: 21:36
Sample (adjusted): 1992 2019
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.165473	0.146979	-1.125825	0.2736
D(X1)	0.055059	0.043553	1.264180	0.2207
D(X2)	0.001314	0.008287	0.158550	0.8756
D(X4)	0.007051	0.083400	0.084545	0.9335
D(X5)	-0.306742	0.092879	-3.302587	0.0036
D(X6)	-0.159479	0.223136	-0.714716	0.4830
R-squared	0.672346	Mean dependent var		-0.082692
Adjusted R-squared	0.590432	S.D. dependent var		0.949309

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S.E. of regression	0.607534	Akaike info criterion	2.040358
Sum squared resid	7.381956	Schwarz criterion	2.330688
Log likelihood	-20.52465	Hannan-Quinn criter.	2.123962
F-statistic	8.207990	Durbin-Watson stat	2.138205
Prob(F-statistic)	0.000238		

Dependent Variable: D(Y)
Method: Least Squares
Date: 02/02/21   Time: 01:33
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X1)	0.088896	0.035518	2.502872	0.0187
D(X5)	-0.123858	0.051492	-2.405387	0.0233

R-squared	0.400376	Mean dependent var	-0.101379
Adjusted R-squared	0.378167	S.D. dependent var	0.904622
S.E. of regression	0.713352	Akaike info criterion	2.228789
Sum squared resid	13.73952	Schwarz criterion	2.323085
Log likelihood	-30.31744	Hannan-Quinn criter.	2.258321
Durbin-Watson stat	1.140148		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.143547	Prob. F(2,24)	0.3354
Obs*R-squared	2.523130	Prob. Chi-Square(2)	0.2832

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/06/21   Time: 22:33
Sample: 1992 2020
Included observations: 29
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002203	0.130068	0.016938	0.9866

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D(X1)	-0.007717	0.035004	-0.220465	0.8274
D(X5)	0.006005	0.046149	0.130122	0.8976
RESID(-1)	0.222016	0.214757	1.033802	0.3115
RESID(-2)	0.175612	0.208914	0.840594	0.4089

R-squared	0.087004	Mean dependent var	-6.89E-17
Adjusted R-squared	-0.065161	S.D. dependent var	0.616307
S.E. of regression	0.636070	Akaike info criterion	2.088569
Sum squared resid	9.710035	Schwarz criterion	2.324309
Log likelihood	-25.28425	Hannan-Quinn criter.	2.162400
F-statistic	0.571774	Durbin-Watson stat	1.918695
Prob(F-statistic)	0.685672		

Heteroskedasticity Test: White

F-statistic	1.332205	Prob. F(5,23)	0.2859
Obs*R-squared	6.512576	Prob. Chi-Square(5)	0.2595
Scaled explained SS	4.079781	Prob. Chi-Square(5)	0.5380

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Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/06/21   Time: 22:37
Sample: 1992 2020
Included observations: 29

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.310654	0.103412	3.004038	0.0063
D(X1)^2	0.002353	0.006757	0.348247	0.7308
D(X1)*D(X5)	-0.001629	0.012507	-0.130256	0.8975
D(X1)	0.001379	0.045166	0.030538	0.9759
D(X5)^2	-0.001960	0.008748	-0.224088	0.8247
D(X5)	-0.062358	0.089705	-0.695140	0.4939

R-squared	0.224572	Mean dependent var	0.366737
Adjusted R-squared	0.056000	S.D. dependent var	0.465968
S.E. of regression	0.452733	Akaike info criterion	1.434961
Sum squared resid	4.714236	Schwarz criterion	1.717850
Log likelihood	-14.80694	Hannan-Quinn criter.	1.523559
F-statistic	1.332205	Durbin-Watson stat	1.945810
Prob(F-statistic)	0.285935		