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The Analysis of The Relationship Between Monetary Financing and the General Budget in the United States from 2008 - 2022

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Abstract:

Monetary finance is a new policy from economic and political discussions concerning government spending. Until 2008, taxes (oil in oil-producing countries) and debt issuance were considered reasonable methods for understanding the balance of the general budget or financing deficits. Governments financed themselves through present taxation, traditional borrowing with repayment from future tax revenue, or financial surpluses resulting from oil price increases in global markets. However, after 2008, central banks resorted to unprecedented monetary finance policies, issuing large amounts of money to stimulate crisis-affected economies. The study aimed to understand monetary finance as a policy imposed by governments on central banks to finance public expenditure during crises. The paper focused on the issue that the US government's reliance on monetary finance led to inflation and an increased national debt during the study period. The study concluded that the US government resorts to borrowing funds through the sale of treasury bills, bonds, and other securities to the Federal Reserve Bank, resulting in the accumulation of public debt and associated interest payable to investors who bought these securities.

Paper type: Paper.
Keywords: Monetary Finance Policy, Public Budget, USA economy, Inflation, Public Debt.
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1.Introduction:

Monetary finance has emerged as a prominent economic policy to address crises affecting advanced and developing economies. Monetary financing involves the direct transfer of funds from the central bank to the central government or the creation of money by the central bank to finance public spending.

Over the past decade and a half, the global economy has faced several crises, including the 2008 global financial crisis and the 2020 health crisis. In response to these crises, central banks lowered interest rates and used unconventional monetary tools to facilitate monetary financing in many economies. These measures helped mitigate the impact of the crises on the economy, particularly the budget deficits of countries. However, this monetary financing had negative effects, such as increased inflation rates and undesirable levels of public debt.

Governments played a significant role in addressing these crises by increasing public spending, leading to a negative impact on the general budget and accumulating government debt.

The relationship between monetary financing and the general budget is manifested in the state of budget deficits. Monetary financing provided to the government leads to increased government spending. This financing has a very low cost for the government due to the near-zero interest rates imposed by central banks or by compelling the central bank to lower interest rates. This reduces public debt and allows the government to increase expenditure for crisis management. However, this has led to an increase in monetary base and aggregate demand, causing inflation, which contradicts the central bank's objectives of price stability and inflation targeting.

1.1 Literature review

There are very few papers who have written about monetary finance policy, as follows:

Monetary finance of budget deficits always leads to stimulating nominal aggregate demand, in some circumstances, it may be a more certain and/or less risky way of achieving this stimulus than any alternative policy lever for that deficit. Therefore, the key question regarding monetary finance is whether it is possible to put in place a set of rules and responsibilities that will safeguard against its serious misuse by governments, while allowing for its use in appropriate amounts and under appropriate conditions. The objective of this study is to assess the potential and suitability of cash financing for budget deficits. As all the truly important issues are political ones, since the technical issues surrounding monetary finance are well understood (or should be) and the technical feasibility and desirability of monetary finance in some circumstances is not in doubt. There is a technical case for monetary finance, particularly in specific conditions such as economic crises in countries (Adair,2015).

Al-Aani (2018) used expansionary fiscal policy leads to an increase in government financial obligations, resulting in the accumulation of government debt. The expansion of government debt negatively affects overall economic performance, as well as monetary policy and the functioning of the central bank. This paper discusses the relationship between government debt policy and monetary policy. It argues that the accumulation of unplanned government debt hampers monetary policy and negatively impacts the performance and effectiveness of the central bank. The paper finds that the Iraqi government relies mainly on the central bank to finance government debt. However, the impact of government debt on monetary policy is relatively limited due to the relatively low level of debt in Iraq. The relationship between fiscal and monetary policies is primarily determined through government budgeting, indicating that changes in the budget deficit and the accumulation of government debt led to changes in the volume of government securities for debt financing purposes. The expansion of government securities issuance provides a significant source of non-inflationary, market-friendly financing for the government. It serves as a preferable alternative to financing from the central bank, which has negative implications in terms of its link to monetary expansion and the risks of inflationary pressures and exchange rate pressures.

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De Grauwe (2020) studied the COVID-19 pandemic has caused an unprecedented negative shock to both supply and demand, as both have a significant impact on the production of goods and services. Since individual income ultimately comes from production, household income decreases rapidly. With many economies already in a downward spiral and heading towards recession, the danger lies in economic contraction turning into a permanent and deepening trend. The paper aims to explore how the European Central Bank can use cash financing and to what extent governments can finance budget deficits. The advantage of cash financing is that it relieves national governments from the need to issue new debts. Since all new debts will be converted into money, the crisis will not lead to an increase in government debt-to-GDP ratios. For countries experiencing severe pandemic situations, the risk of bondholders' panic will be eliminated. Furthermore, the end of the health crisis will not leave a lasting impact of unsustainable levels of government debt. The European Central Bank must acknowledge that cash financing to support deficit spending is not only a necessity to alleviate the COVID-19 crisis but also to avoid a severe contractionary cycle that could unravel the Eurozone.

Brian (2021) Proved governments are currently facing increasing debt burdens relative to central banks, because of the monetary finance introduced since 2008 in response to the financial crisis, as well as the health crisis in 2020. The relationship between monetary financing and crises that occur in advanced economies such as the United States and the Eurozone can be explained as follows: In certain economic circumstances, such as crises, the ability to print money can provide governments with something close to "free money". However, this "free money" is not entirely unlimited or accessible to governments at any given time. The limited size and availability of monetary finance opportunities point to the precise design of institutions to direct and efficiently allocate their mandates over time. Ensuring non-exploitative responses by policymakers to monetary finance policies is crucial because they are considered a blatant interference with the independence of central banks.

Itai et al (2022) Proved monetary finance leads to an increase in inflation rates, thus indicating a direct relationship between the two. The paper examines whether unconventional policy programs and monetary financing during the Covid-19 pandemic have led to an increase in inflation expectations. The paper reviews the main arguments for and against monetary financing, particularly when monetary policy is constrained by liquidity traps and the effectiveness of fiscal policy is limited due to high public debt. Easing restrictions by central banks entails significant risks; therefore, potential experiments with monetary financing should be limited to extreme economic conditions.

Daghir (2022) studied money transfers deducted from the treasury at the central bank have contributed to an increase in the monetary base, directly resulting in higher inflation levels. This paper emphasizes the importance of ensuring that fiscal policy determines the desired level of financial deficit coverage, followed by the role of monetary policy in selecting the tool through which this deficit is financed, to achieve a financial objective of deficit coverage without harming monetary policy, particularly in terms of high inflation rates. The key conclusion is that cash transfers deducted from the central bank have contributed to an increase in the monetary base, which is directly reflected in the rise of inflation levels in the economy. The main recommendation is the necessity to use non-inflationary debt instruments such as treasury bonds and loans to control excess liquidity and restrain inflationary pressures. Additionally, it highlights the importance of activating open market operations by relying on bonds as a source of deficit financing.

Marie et al (2023) despite the significant increase in government spending in Iraq, it was not directed towards the crucial sectors that play a vital role in revitalizing the productive structure. Instead, most public expenditures were allocated to cover necessary imports or to address various shocks, whether they be security-related or health-related. As a result, Iraq's exports of goods and services experienced a continuous decline.

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The objective of the study was to emphasize the importance of public debt and its impact on the trade balance, as well as to identify economic policies that can contribute to strengthening the trade balance. The study, using the Autoregressive Distributed Lag model (ARDL), demonstrated a direct relationship between domestic debt and the net trade balance. Conversely, an inverse relationship was observed between external debt and the trade balance. Specifically, an increase in external debt led to a decrease in the net trade balance. The study provided several recommendations, including the need for directing public debt funds, whether domestic or external, towards building and expanding productive capacity. It also suggested that borrowing should be solely for public investment rather than consumption. Additionally, the study stressed the importance of supporting the private sector as the primary engine for productive sectors.

The problem statement is the USA government's resort to monetary finance has resulted in inflation and an increase in national debt during the period 2008-2022.
The most prominent objective of the study aims to examine monetary finance as a policy imposed by governments on the central banks finance public Expenses under pretext in crisis management. Furthermore, the study aims to analyze the relationship between monetary finance as a tool adopted by central banks and its impact on macroeconomic variables.

2.Material and Methods:

The paper hypothesis monetary finance has contributed to improvement in expenditure performance in the USA general budget.

2.1 The general concept of monetary finance:

Monetary finance is defined as the creation of money by central banks to finance public spending. This can be done through direct purchases of government debt (bonds) by the central bank (Tober and Watt, 2015), or by expanding the money supply to increase the government budget resources (Batman, 2021).

Monetary finance is also defined as the financing of the general budget deficit by the central bank, resulting from increased public spending and a significant sovereign debt held by the central government (Ryan-Collins, 2015). The latter definition focuses on the effect of monetary finance (MF) on the budget, reflecting the important liquidity provided by central banks for government expenditures.

Monetary finance can be defined as the process of transferring funds from central banks to the government, either directly or indirectly. It is used during economic crises to cope with increased government spending. In other words, monetary finance aims to create and deploy low-cost funds from central banks to governments to address and manage public debt and budget deficits. Monetary finance for government requires three essential elements: (Batman, 2021)

A. Expenditure money supply: MF occurs in central banks exercise their legal power create currency (legal tender) or reserves commonly referred to as "central bank reserves." These reserves are the most important type of liquidity held by central banks with direct legal authority.

B. Non-debt creation for governments: the transfer of funds from the central bank (CB) to account government without repayment obligations by the government is a clear example of MF. These transactions, such as direct purchases of sovereign bonds by the central treasury, create government debt, as the national treasury bears official and legal obligations to repay the interest to the central bank. This is distinct from credit transactions among economic agents in the private sector, where rights and obligations net off to zero in unified sector public entities, and clear judicial enforcement mechanisms do not exist for contractual disputes between central banks and governments.

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C. Budget resource for central governments: MF is worth because it provides governments with additional budget resource. Such resource fuel governments spending under financial circumstances, including general budget deficits.

2.2 Types of monetary financing in central banks

Monetary finance can be divided into two main types: direct and indirect, as illustrated in the diagram (1) (DeGrauwe, 2020).

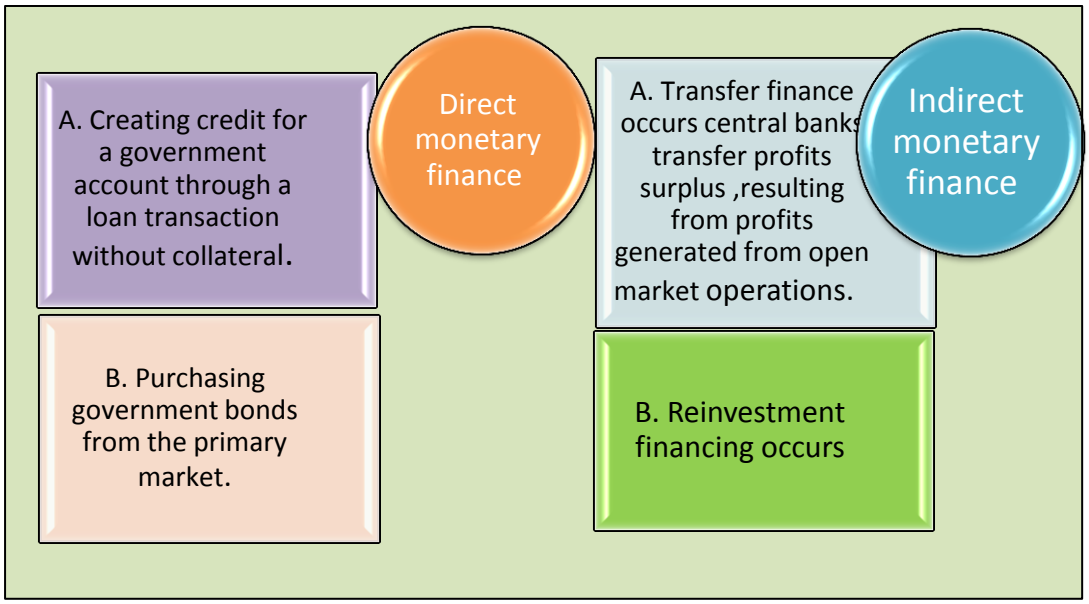

Figure 1: Types of Monetary Finance (MF)

2- Monetary Finance in USA:

The (MF) policy in the United States of America restricts the (fed) directly finance the USA. Treasury. However, it allows for two types of indirect monetary financing. It allows for the financing of transfers under legislative provisions of interest earnings on debt religion bonds acquired through programs asset purchase, as well as finance reinvestment under legal provisions allowing direct purchases of government debt religion bonds in open market auctions.

The (fed) act grants the bank general institutional powers, including the authority to enter contracts for credit provision and asset purchases. It also grants the use of that general authority to provide credit to the sector financial through detailed legislative rules on bank advances and, most importantly, the implementation of open market operations (OMO) by the FRB New York based on the instructions of the federal open market committee (FOMC).

The Federal Reserve replay on this legal authorize to conduct repurchase operations, and direct sale/ purchase operations, facilitating both traditional monetary policy operations and unconventional quantitative easing (QE) measures.

OMOs provide legal authority to the FRBNY to purchase USA debt religion bonds, subject to the restriction that this authority should not be exercised in a bilateral or "closed market" arrangement with the USA federal government. This limitation on monetary finance direct is expressed in the final words of Section (14), paragraph (b)(1) of the Finance (Obaid, 2020).

The excess funds transferred from the (fed) to the USA Treasury are referred to as "transfers", which is a form of indirect monetary finance. In normal times, transfers result in a minimal amount of MF, representing a small portion of the profit flows from short-term credit operations (primarily repurchase agreements and secured lines of credit), which constitute relatively small expansions of the Money Supply (MS).

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In times of crisis, however, transfers provide significant amounts of indirect MF. The extensive purchases of assets under the quantitative easing program have led to an expansion of the unified general fund of the Federal Reserve's System Open Market Account, (SOMA), increasing volume of transfers significantly. Transfers ranged in (1998 -2008) between ($8.7) to ($34.5) billion, and then rose to ($47.4) billion and approximately ($96.9) billion between 2009 and 2017 (Fed, 2020).

These monetary transfers from the fed to the USA treasury represent indirect monetary finance on two fronts:

-The portion transfers attributed to the interest payment on USA treasury debt serves as partial relief for USA Treasury debt.

-The portion of transfers attributed to the interest payment on non-treasury represents returns on assets obtained by the central bank through expansions of the supply money.

Both forms of monetary finance is permitted under the provisions of "FRA" transfers (fed Agreement).

2-1 Transfers in the USA Federal Reserve System:

The fed unified account (SOMA) to the "USA treasury" in accordance with section (7) of the financial Resource Act. Net profits earned by the United States of America from the fed are applied to reduce outstanding debts owed by the United States. The flow of funds from Figure (2) illustrates.

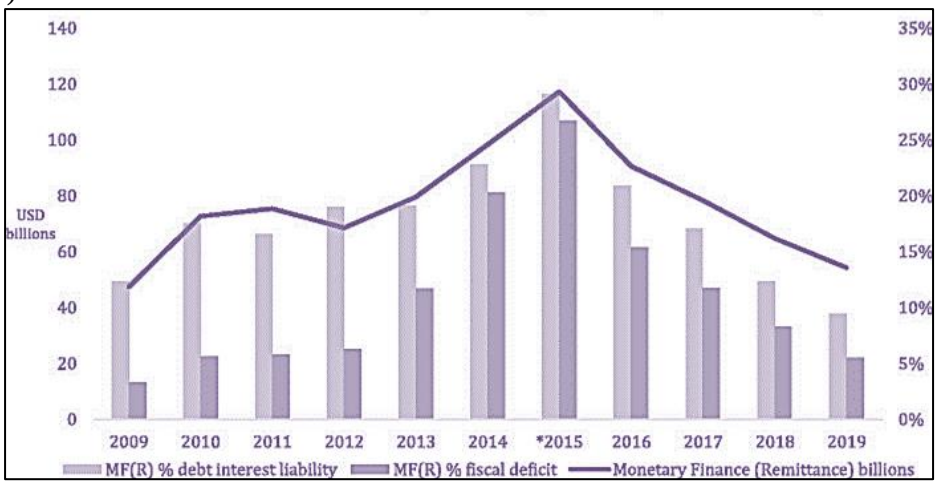

Figure 2: Federal System, Federal Reserve remittance

In Figure 2, which shows MF in the United States through transfers, three variables can be observed. The first variable is the vertical column representing debt interest obligations. The bold column indicates the budget deficit, and the straight line represents the volume of MF (transfers) provided to the federal government.

Since the beginning of quantitative easing in 2009, assets worth $2 trillion have been purchased. By mid-2010, SOMA had stabilized at just over ($2) trillion. The second round of quantitative easing added around ($600) billion in US Treasury bonds between 2010 and mid-2011, in addition to transfers to the USA treasury, leading to an expansion of the money supply. However, there was no expansion in the public budget, as the (FRBNY) executed the extended maturity program. This resulted in no increase in the (MS) or transfers to the Treasury.

The third quantitative easing program was announced by the FOMC, adding $1.5 trillion to SOMA by December 2013. The financial transfers significantly increased between 2013 and 2015, ranging from $80 billion to $120 billion, which accounted for approximately 20-30% of annual interest obligations on US public debt and (12-25%) of the US budget deficit.

Between 2015 and 2017, the Federal Reserve continued to maintain its quantitative easing holdings through reinvestment programs. However, SOMA began late in 2017 to contract

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due to the reinvestment of maturing securities through normalization programs, resulting in the withdrawal of approximately ($800) billion in assets from SOMA between (2017-2019). This contraction in the (MS) led to a relative decrease in transfers to the USA treasury during the same period from, ($80) billion to around ($50) approximately (10%) of USA debt interest obligations. This led to a relative decrease in the deficit from (15%) to around (5%).

2-2 Reinvestment in the Federal Reserve System:

Reinvestment in the (fed) system occurs through the following steps:

1.The USA treasury debt securities (bonds A) private entities with special privileges to purchase government debt in the market primary, participating in the (CB) asset purchase programs (primary dealers).

2.The purchases of (CB) bonds A in the dealer's primary through the quantitative easing program.

3.The USA treasury pays the coupon payments of bonds A the central bank, which transfers a percentage of these paid the treasury of government.

4.The announces of central bank that it will reinvest expired bonds into similar bonds purchased through the quantitative easing program (bonds B-D).

5.The central bank reinvests bonds A into bonds B-D by replacing the expired bonds A with bonds B-D or using the principal amount of bond A to purchase bonds B-D.

6.In jurisdictions where reinvestment occurs in primary sovereign debt markets (such as the USA):

a. The USA treasury issues bonds B-D directly to the central bank as a secured buyer.

b. The central bank's reinvestment program provides monetary funding (CB) guarantee buyers in the market primary.

7. In jurisdictions when occurs reinvestment in secondary markets (such as the euro system and the United Kingdom):

a. The Treasury issues bonds (B-D) with the knowledge that primary dealers will have access to the central bank's reinvestment program.

b. Primary purchase dealers' bonds(B-D) and sell them to central bank in the secondary market.

c. The reinvestment program of central banks provides monetary funding through additional demand in the primary market for government debt attributed to central banks, ensuring secured buyers in the secondary market.

The simplified measure of extent reinvestment (MF) is the amount total of the base amount reinvested in a government in the market primary, a practice followed by the Federal Reserve. In times of crisis, the total volume of public debt purchase represents (MF) because treasury is guaranteed purchaser even after reinvestment (Abdullah and Mansor,2018).

The direct purchase by the fed of bonds from the USA treasury through reinvestment programs under the ruling provided by Section 14 of the financial services and general government appropriations act to purchase USA sovereign debt in the open market at USA treasury auctions.

The initial period of reinvestment (2009-2011) reflects the modest volume and frequency of reinvestment operations, with a relatively small amount of short-term USA Treasury bonds retained.

The US federal reserve did not conduct any direct purchases from the USA treasury during the years (2013-2015) because the maturity extension program allowed funds to flow from the federal reserve's SOMA into the treasury. As shown in the figure 3.

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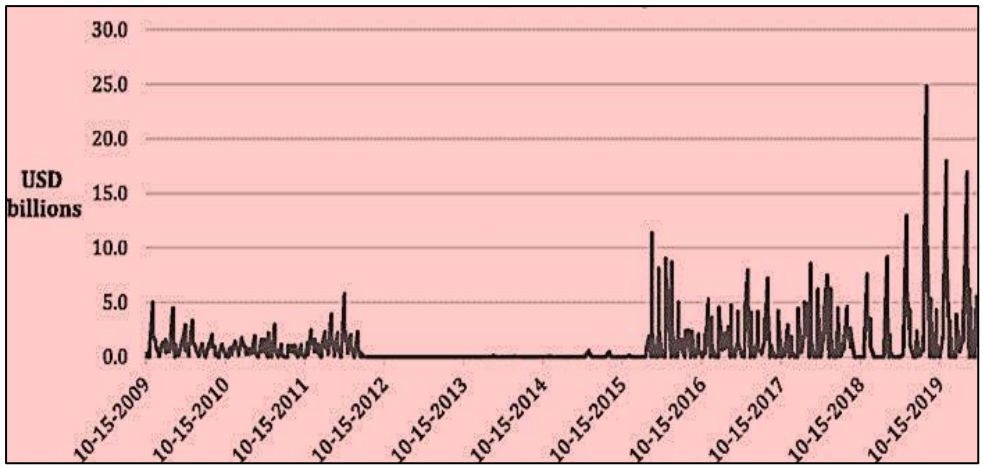

Figure 3: USA monetary finance through reinvestment.

As secondary market reinvestment programs occur, the measurement of the cash demand they generate, and thus the amount of MF provided, is less transparent. However, this limit does not completely prevent central banks from providing reinvestment (MF), as the announcement of reinvestment creates artificial demand in the secondary market for government debt, reducing funding costs for governments in markets primary. This requires determining the precise money yield for reinvestment programs and then determining the relationship between (market primary) borrowing costs and the impact and operations on market participants in the (market secondary).

2.3 Monetary finance policy and its reflections on certain economic variables in the United States.

The pandemic created conditions for a significant expansion of legal MF following the financial crisis. Since the onset of the pandemic, central banks around the world have taken emergency measures in response to the sudden halt in demand, supply in financial and non-financial economies resulting from collective (lockdown) measures imposed by countries to slow the spread of the (virus).

2.3.1 Analysis of monetary finance forms: Securities holdings:

Table (1) illustrates the types of securities issued by the US government (treasury department) to finance public expenditures and subsequently cover deficits and debt. It can be observed that the US government has four main types used in dealing with the Federal Reserve.

Table 1: Types of monetary finance in the USA for the period (2008-2022) in billions of dollars**.**

Year	treasury bonds	Mortgage-backed securities	Credit and liquidity facilities	Other assets	Total (billions of dollars)
2008	475,92	19,71	1605,85	137.98	2,239
2009	776,59	1068,14	280,28	109,06	2,234
2010	1016,10	1139,60	138,19	126,67	2,420
2011	1672,09	941,29	143,96	168,75	2,926
2012	1656,93	1003,34	11,85	235,18	2,907
2013	2208,83	1554,16	2,20	267,38	4,032
2014	2461,36	1775,51	3,35	257,44	4,497
2015	2461,55	1780,41	3,35	241,27	4,486
2016	2463,60	1757,57	6,58	223,70	4,451
2017	2454,22	1769,32	13,86	211,28	4,448
2018	2240,72	1639,53	4,28	191,10	4,075

2019	2328,86	1422,33	3,74	410,66	4,165
2020	5140	1286,14	3,86	---	6,430
2021	5431	2497	---	520,0	8,448
2022	5329	2594	3,0	---	7,926

Source: The Federal Reserve, Monetary policy Report (2008-2023).
https://www.federalreserve.gov/monetarypolicy/2020-02-mpr-part2-accessible.htm

Monetary Finance Forms in the United States of America for the period (2008-2022).

It is observed that the total value of bonds holdings, treasury transfers, and other securities increased during the period (2008-2022). It was around $2,239.46 trillion in the financial crisis year 2008, and it rose to approximately $8,448 trillion in 2021 to deal with the 2020 health crisis. This indicates the US government's resort to cash financing as a policy to address crises that occur from time to time.

It is noted that the demand for central treasury transfers was relatively weak in the 2008 financial crisis. This was due to the monetary policy followed before the crisis. Treasury transfers were about $475.92 billion in 2008. After the budget deficit worsened and the national debt of the United States increased, treasury transfers were used as low-cost (MF) for coping, and it rose to about $5,329 trillion in 2022.

On March 15, 2020, to stimulate the performance of central treasury bond markets and agency mortgage-backed securities (MBS), the Federal Open Market Committee announced that it would increase its treasury bond holdings by at least $500 billion, increase asset purchases of agency MBS by at least ($200) billion, and reinvest all principal payments from MBS holdings (Monetary policy report, 2022).

Despite being significant initially in late March 2020, they were gradually reduced in the following weeks as market conditions improved. The weekly amounts of purchases peaked at ($350) billion and ($180) billion for treasury bonds and MBS, respectively. The pace of purchases gradually declined in the following weeks, reaching around $20 billion and ($26) billion in mid-August, respectively (Dadooh,2020).

Securities holdings represent about 90% of the Federal Reserve's total reserves - as of 2022. The Federal Reserve's holdings of securities, as a share of all outstanding treasury debt, increased from (15%) to approximately (22%).

In the 2020 health crisis, the fed implemented two forms of repurchase operations, expenses traditional repurchase operations and introducing a new temporary repurchase facility for foreign and international monetary authorities (FIMA).

Based on the above, it is evident that paper and experts in monetary policy will need to understand the full economic and institutional effect of these measures emergency through precise scientific paper, after the stabilization of economic and social conditions. However, at present - two years after the health crisis - two important issues regarding (MF) can be observed:

Firstly, the fed, European Central Bank (ECB), and the England central Bank are implementing (COVID-19) emergency programs under the same legal frameworks that allowed or necessitated indirect and direct monetary finance from (2008 – 2019).

Secondly, assuming the continuity of these legal frameworks without change, it is likely that the increasing volume of quantitative easing programs by central banks will witness significant level of monetary finance in the USA, the European Union, and the United Kingdom through transfer financing and reinvestment as assets in the central banks' quantitative easing portfolios mature and yield interest(Hussein and Hamdan, 2020) among other factors such as the rate interest on government debt purchased by central banks and the central banks' policies regarding reinvestment of their own quantitative easing portfolios.

Nevertheless, the papers believes that (MF) will continue to be a characteristic of the institutional stance of the fed, specifically, and central banks in general after the receding of the coronavirus pandemic.

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2.3.2 Analysis of the relationship between monetary finance and the public budget

The general budget has consistently recorded deficits throughout the study period, with the highest deficits occurring in 2009 and 2020 (refer to Table 4). These deficits were primarily caused by a decrease in general revenues due to the economic recession in 2008 and the halt in global trade in 2020, leading to a decrease in tax revenues, which are the main source of funding for general expenditures. This further exacerbated the deficit in the general budget during those years.

Each year, the deficit adds to the national debt (Safwat,2019), The deficit is financed through the sale of treasury bonds, which the government must subsequently repay with interest. Another key factor, which is not part of the federal government, is the behavior of traders, investors, and managers in the financial markets, particularly Wall Street, as it significantly affects the economy.

Trading through foreign exchange markets contributes to the fluctuation of the US dollar and foreign currencies, which in turn affects import and export prices. Hedge fund managers seek higher returns through trading in risky commodities and futures contracts, many of which have minimal regulations. The commodity market is where food, minerals, and oil are traded. Additionally, bubbles and collapses in the stock market and real estate market impact the overall economy, leading to recessions and economic downturns, ultimately resulting in a decrease in tax revenues and an increase in the general budget deficit.

We will analyze the impact of MF on the national debt and subsequently examine the effect on inflation rates. Table 4 provides data on the general budget and national debt in the United States from 2008 to 2022.

Table 2: Impact of Monetary Finance on Deficits and Debt in the USA during the period (2008-2022) in trillion dollars.

Year	Total revenue	The rate Revenue %	Total expenditures	The rate Expenditures %	Deficit value	National Debt	The rate National Debt %
2008	4,509	---	5,484	----	- 975	9.430	----
2009	4,085	(9.4)	5,992	9.2	- 1.907	10.980	16.4
2010	4,329	5.9	5,982	(0.1)	- 1.653	12.790	16.4
2011	4,536	4.7	6,050	1.1	- 1.514	13.970	9.2
2012	4,731	4.2	6,048	(0.03)	- 1.317	15.220	8.9
2013	5,270	11.3	6,036	(0.1)	- 766	16.090	5.7
2014	5,507	4.4	6,217	2.9	- 710	16.810	4.4
2015	5,764	4.6	6,407	3.0	- 643	17.560	4.4
2016	5,829	1.1	6,646	3.7	- 817	18.420	4.8
2017	5,969	2.4	6,904	3.8	- 935	19.030	3.3
2018	6,207	3.9	7,299	5.7	- 1.092	20.340	6.8
2019	6,461	4.0	7,689	5.3	- 1.228	21.550	5.9
2020	6,489	0.4	9,438	22.7	- 2.949	26.590	23.3
2021	7,320	12.8	10,029	6.2	- 2.709	28.070	5.5
2022	4.900	(33.0)	6.270	(37.4)	-1.370	31.105	10.8

Source: 1.The Federal Reserve, Monetary policy Report (2008-2023) .https://fiscaldata.treasury.gov/datasets/monthly-treasury-statement/outlays-of-the-u-s-government .

2- USA fiscal deficit data from, USA Department of Treasury and Office of Management and Budget, Financial Report of the United States Government, Bureau of the Fiscal Service (Report 2008–2022).https://fiscaldata.treasury.gov/americas-finance-guide/federal-spending.

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It is noted that the US government resorts to borrowing money through the sale of treasury bills, bonds, and other securities to finance the general budget deficit. The public debt is accumulation of borrowing, along with the associated interest owed to investors who purchase these securities. Since the federal government experiences recurring deficits, which is common, the national debt grows larger than the deficit.

As a result, the national debt in the United States increased by (16.4%) after the financial crisis, due to a (9.2%) increase in federal expenditures, causing a rise in the general budget deficit, which reached around ($2) trillion. With reduced sovereign revenues facing significant expenses, the federal government resorted to unconventional monetary policy tools, as well as monetary finance in its debt coverage operations.

The government also uses operational (federal monetary profits) available from the fed reserve account to address the deficit. This may be like a business activity that uses a credit limit from a bank to fund spending on a large project, such as building a factory (Fed, 2022).

In result, the relationship between monetary finance and the general budget deficit is reciprocal, as an increase in the deficit will lead to an increase in monetary finance to cover it.

2.4 Analyzing the relationship between monetary finance, national debt, and inflation,

the fed has various monetary policy tools it uses to influence the economy, such as the federal funds rate, which is adjusted by the FOMC to change interest rates. The fed also directs available financial institutions to lend by buying or selling securities to member banks. Selling securities leads to an increase in interest rates, while buying securities leads to a decrease in interest rates. Finally, the money supply allows the fed to manage inflation and influence the unemployment rate.

The core inflation (excluding electricity, fuel, and volatile goods) is what the fed speaks about. When they say the target inflation rate is 2%, this is the rate the fed deems necessary to maintain a stable economy. When inflation is within this range, it is considered safe, and it is also likely that interest rates will remain low enough throughout the economy to sustain economic growth. However, they should not be so low that the central bank cannot lower interest rates in the case of economic slowdown or recession.

Nevertheless, the cost of addressing crises - financial and health - was necessary as fiscal policy solutions were not available. Therefore, policymakers turned to monetary authority and worked on using monetary finance policy to rescue the US economy, specifically by injecting cash liquidity to stimulate aggregate demand and thus overall economic growth.

Table 3: The impact of monetary finance on the national debt and inflation in the United States

Year	Monetary Finance	National debt	The rate Mf to debt %	GDP	The rate Debt to GDP %	Monetary base	Inflation rate Annual %
2008	2,239	9,430	23.7	14,769	63.8	830	3.8
2009	2,234	10,980	20.3	14,478	75.8	1,712	2.7
2010	2,420	12,790	18.9	15,048	84.9	1,995	1.6
2011	2,926	13,970	20.9	15,599	89.5	2,047	3.1
2012	2,907	15,220	19.0	16,253	93.6	2,640	2.0
2013	4,032	16,090	25.0	16,843	95.5	2,741	1.9
2014	4,497	16,810	26.7	17,550	95.7	3,728	1.8
2015	4,486	17,560	25.5	18,206	96.4	4,017	1.0
2016	4,451	18,420	24.1	18,695	98.5	3,792	1.5
2017	4,448	19,030	23.3	19,477	97.7	3,595	2.6
2018	4,075	20,340	20.0	20,533	99.0	3,824	2.1
2019	4,165	21,550	19.3	21,380	100.7	3,346	1.8
2020	6,430	26,590	24.1	21,060	126.2	5,149	2.6
2021	8,448	28,070	30.0	23,315	120.3	6,027	3.6
2022	7,926	31,105	25.4	25,461	122.1	5,405	7.3

Source :1- The Federal Reserve, Monetary policy Report (2008-2023). https://fiscaldata.treasury.gov/datasets/monthly-treasury-statement/outlays-of-the-u-s-government . 2-Monetary Base; https://fred.stlouisfed.org/series/BOGMBASE

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Table (3) shows that the increase in monetary finance as a tool to cover the deficit in the US general budget has led to an increase in the national debt, especially during the financial crisis in 2008, where monetary finance increased in relation to the national debt by about 23.7%. This increase continued throughout the study period, reaching around 26.7% in 2014, because of the economic recession and the increase in government spending, which reached about $6,217 trillion (table 4). It then decreased to about 19.3% in 2019 because of the US government paying off some of the treasury bonds to the Federal Reserve. However, the health crisis that occurred in 2020 led to an increase in government spending, especially on healthcare and unemployment benefits, which reached about $9,438 trillion against total revenues of about $6,489 trillion, resulting in a financial deficit that was covered through monetary finance. This directly reflected an increase in the national debt, which reached about $31,105 trillion in 2022.

Therefore, the size of the national debt in the United States has witnessed a continuous increase throughout the period (2008-2022), prompting the federal government to resort to monetary finance to cover the recurring budget deficit during this period, considering that monetary financing is low-cost. Consequently, the government issued several treasury bills, bonds, and other securities to address the crisis.

As for the impact of monetary finance on inflation, as depicted in figure (3), traditional economic theory suggests that any increase in the money supply leads to inflation, as more money chases the same amount of goods and services. However, it is observed that monetary expansion during the 2008 financial crisis resulted in a slight change in the inflation rate. According to economic theory, inflation is the primary cost of pursuing monetary finance. If inflation does not always follow significant monetary expansion, monetary finance provides extremely cheap government financing "at least in some macroeconomic environments" (Gabo, 2022).

It can be observed from figure (4) that monetary expansion in 2008 and onwards led to a significant increase in the monetary base, but at the same time did not result in inflation; on the contrary, it relatively decreased, except for the last three years of the study period when the inflation rate increased to about 7.3%. This is due to the rise in the monetary base from (3,346) trillion dinars in 2019 to about (6,027) trillion dinars in 2021, and what has reinforced the exacerbation of inflation is the Russian Ukrainian war, which led to a shortage of supply chains and a rise in energy prices in the world. As an empirical issue, it is noted The speed of money circulation has increasingly decreased, reaching more than (60%) in the United States for the period between 2008 and 2022 (note Table 3), as a result of using money for saving rather than facilitating transactions exclusively, and as a result, the total remains Spending was relatively stable, and inflationary pressures remained fairly stable (Monetary policy report, 2023).

Despite the decrease in the speed of money circulation, private sector banks have become less responsive in translating increases in basic funds into increases in the total money supply. Before 2008, banks never held excess reserves and when central banks increased their reserves by purchasing assets from banks, private banks quickly used the reserves for new lending, increasing the amount of money in current accounts and similar instruments. As a result, expansions in the underlying money supply quickly translated into expansions in the total money supply, making inflation more likely.

However, since 2008, private banks have been willing to hold excess reserves. Like other banks when banks hold excess reserves rather than lending them out, expansions of base money (monetary finance) cause a smaller increase in the total money supply. From what was mentioned, it is noted that the link between monetary financing and inflation is weakening.

From the above, it is noted that the relationship of monetary finance is positive with the national debt and inflation. Whenever the value of monetary finance increases, this leads to an increase in the monetary base (exported currency + bank reserves), and thus higher inflation rates.

But on the other hand, the paper believes that there may be another view on this concept, as it depends on the economic environment, tools for financing public debt, the size of the government, the speed of money circulation, the extent of development of the banking system, the flexibility of production and its response to changes, as well as the competitiveness of the productive sectors.

2.5 The impact of monetary finance on the accumulative price increase in the United States

Based on the values of monetary financing from 2008 to 2022, and its use in financing deficits and debt during the same period in the United States, we can approximate the increase in price levels in the Eurozone, using simplified methods such as relying on the Quantity Theory MV = PY.

As known, the quantity Theory represents a long-term relationship between prices and money. It may not necessarily be a good indicator of annual price changes, especially when the growth of supply money is relatively small, as was the case in industrialized countries over the past forty years. In these countries, crises or fluctuations in money supply and velocity lead to disruptions in the relationship between the price level and the money stock, contrary to countries with a history of significant changes in their money supply. In such countries, the Quantity Theory tends to be a much better indicator of price changes (De Grauwe and Polan,2005). Therefore, the question arises as to whether the increase in the monetary base resulting from MF will greatly impact the stock money or not.

Table (4) shows the ratios of accumulative price increase based on the monetary base and monetary financing provided to finance deficits and debt in the United States, after calculating the velocity of money circulation during the period (2008-2022):

Table 4: The impact of monetary financing on the accumulative price increase for the period (2008-2022) trillion dollars

Year	Monetary Finance (1)	Money Base MB (2)	MB with MF	Δ MB	GDP (4)	M3 (5)	Velocity of Money (6)	MB * V / GDP With OUT MF 4 /6 * 2 % (7) =	MB * V / GDP With MF 4 /6 * 3 = % (8)	Cumulative price increase % (9)
2008	2239	1666	3908	---	14,769	7,790	1.9	0.21	0.50	%138
2009	2234	2026	4260	352	14,478	8,416	1.8	0.25	0.52	%108
2010	2420	2016	4436	176	15,048	8,626	1.7	0.22	0.50	%127
2011	2926	2619	5545	1109	15,599	9,256	1.7	0.28	0.60	%114
2012	2907	2702	5609	64	16,253	10,050	1.6	0.26	0.55	%111
2013	4032	3717	7749	2140	16,843	10,727	1.6	0.35	0.73	%108
2014	4497	3933	8430	681	17,550	11,388	1.5	0.33	0.72	%118
2015	4486	3835	8321	(109)	18,206	12,045	1.5	0.31	0.68	%119
2016	4451	3531	7982	(339)	18,695	12,860	1.4	0.26	0.60	%130
2017	4448	3851	8299	317	19,477	13,590	1.4	0.27	0.60	%122
2018	4075	3411	7486	(813)	20,533	14,103	1.4	0.23	0.51	%121
2019	4165	3426	7591	105	21,380	14,818	1.4	0.22	0.49	%122
2020	6430	5206	11636	4045	21,060	17,650	1.3	0.32	0.71	%121
2021	8448	6413	14861	3225	23,315	20,525	1.2	0.33	0.76	%130
2022	7926	5405	13331	(1531)	25,461	21,576	1.1	0.23	0.58	%152

Source: The Federal Reserve, Monetary policy Report (2008-2023). https://fiscaldata.treasury.gov/datasets/monthly-treasury-statement/outlays-of-the-u-s-government.

Columns 1, 2, and 4 are based on the previous tables. The cumulative increase in prices was extracted according to the following equation = $100 \times \frac{\text{7 column} - \text{8 column}}{\text{7 column}}$.

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From the table (4), it is observed that the creation of money through the monetary finance policy to finance the deficit and public debt resulting from the financial crises of 2008 and the health crisis of 2020 has raised the price levels in the United States between (108% and 152%) depending on the amount of monetary finance added each year (as shown in Table 4).

The cumulative increase came through the monetary finance policy, which led to an increase in the monetary base, rising from $1.666 trillion in 2008 to about $5.405 trillion in 2022. This has increased the money supply in the US economy, which reached about $21.576 trillion in 2022, up from $7.790 trillion in 2008.

Therefore, it is found that the monetary finance policy has led to an increase in inflation in the United States because financing the deficit and public debt has changed the financial reserve center list of the fed (increasing the size of the public budget), which in turn led to an increase in the money supply, causing inflation.

3. Discussion of Results:

Although the fed is considered one of the tools of the USA government, it considers itself an independent central bank because its monetary policy decisions do not necessarily need approval from the USA President or any other person in the executive or legislative branches of the public. The fed does not receive any funding from the senate, and terms of the board of government members extend over multiple presidential terms. There is a positive relationship between MF and national debt and inflation. As the value of MF increases, it leads to an increase in the monetary base (currency in circulation + bank reserves), thus causing inflation rates to rise. This is because the circulation of funds injected to address deficits and national debt does not face withdrawal after economic conditions improve, resulting in an increase in the money supply, which causes inflation. USA law restricts the powers of the FRBs to direct finance the USA treasury, but it allows for 2 types of indirect MF. It allows for the financing of transfers under the legal provisions of transfers (to the USA department of the treasury) of profits resulting from interest paid on debt securities acquired through purchase asset programs. It also allows for the financing of reinvestment under the legal provisions that allow for direct purchases of government debt securities in open treasury auctions.

4. Conclusion:

Based on the research discussed, the researcher reached the following conclusions:

1- Although the fed is considered a tool of the USA government, it considers itself an independent central bank because its monetary policy decisions do not necessarily require the approval of the US president or any other person in the executive or legislative branches of the government. The fed does not receive any funding from the Senate, and the terms of the members of the Board of Governors may extend for several presidential terms.

2- The fed Bank turned to using unconventional monetary tools due to the failure of traditional tools in facing crises, especially the financial crisis, and the policy rate tool falling into the liquidity trap. This is a real shift in the functioning of central banks around the world, and thus the fed has a high degree of flexibility in facing crises.

3- The Fed relies on the FOMC in monitoring the developments taking place in the economy and, specifically, in the financial markets. Based on this monitoring, the data and decisions are issued to address unusual economic situations.

4- USA law restricts the powers of the FRBs to direct finance the USA treasury, but it allows 2 types of indirect MF. It allows financing transfers under the legal rules for transfers (to the USA treasury) of profits resulting from interest paid on debt securities acquired through asset purchase programs. It also allows financing reinvestment under the legal rules that allow directly purchase of a debt securities government in open treasury auctions.

5- Indirect MF is permitted under the profit-sharing rules set forth in section (7) of the financial resources law, which requires the transfer of excess funds from the fed to the USA treasury. The amounts transferred to the US treasury are calculated by deducting them from the Federal Reserve's total profits if they do not exceed ($6.825) billion in total surplus.

6- The US government has many securities (forms of monetary finance) that give it the right to deal with the fed through the secondary market. These are among the most important low-cost or quasi-zero-cost methods of financing public expenses or smoothing deficits and national debt, compared to financing from private sector companies.
7- To finance the public budget deficit, the US government resorts to borrowing money by selling treasury bills, bonds, and other securities. The general debt is thus the accumulation of this borrowing with the associated interest owed to investors who buy these securities. Since the federal government is suffering from recurring deficits, which is a common occurrence, the national debt is growing at a faster rate than the deficit.
8-The relationship between monetary finance and national debt and inflation is positive, as an increase in monetary finance leads to an increase in the monetary base (currency issued + bank reserves), thus causing an increase in inflation rates. This is because financing deficits and national debt is not faced with withdrawals after economic conditions improve, so the money that was injected to address the situation remains in circulation, increasing the supply money that causes inflation.

Authors Declaration:
Conflicts of Interest: None
-We Hereby Confirm That All The Figures and Tables In The Manuscript Are Mine and Ours. Besides, The Figures and Images, which are Not Mine, Have Been Permitted Republication and Attached to The Manuscript.
- Ethical Clearance: The Research Was Approved by The Local Ethical Committee in The University.

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تحليل العلاقة بين التمويل النقدي والموازنة العامة في الولايات المتحدة الامريكية للمدة 2008-2022

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مستخلص البحث:
ان التمويل النقدي سياسة جديدة من المناقشات الاقتصادية والسياسية والمتعلقة بتمويل الانفاق الحكومي ، وحتى عام 2008 كان النظر الى الضرائب (النفط في الدول الريعية) واصدار الديون وتجاهل التمويل النقدي طريقة معقولة لفهم توازن الموازنة العامة – او تمويل العجز – حيث قامت الحكومات بتمويل نفسها اما عن طريق فرض الضرائب في الوقت الحاضر او عن طريق الاقتراض بشكل تقليدي ثم السداد من ايرادات الضريبة المستقبلية او عن طريق الفوائض المالية المتحققة ازاء ارتفاع اسعار النفط في الاسواق العالمية، لكن الامر اختلف بعد عام 2008 وذلك حين لجات البنوك المركزية الى استخدام التمويل النقدي كسياسة غير مسبوقة ، واصدرت مبالغ مالية كبيرة لتحفيز الاقتصادات المتأثرة بالأزمات للمواجهة . وكان هدف الدراسة التعرف على التمويل النقدي كسياسة تم فرضها من قبل الحكومات على البنوك المركزية لتمويل حجم النفقات العامة بحجة مواجهة الازمات التي تحدث بين الحين والآخر ، وقد ارتكز البحث على مشكلة مفادها ان لجوء الحكومة الامريكية الى سياسة التمويل النقدي ادى الى حدوث التضخم وارتفاع في حجم الدين القومي خلال مدة الدراسة، وقد توصل البحث الى نتيجة بان الحكومة الامريكية تلجا في تسييل عجز الموازنة العامة الى اقتراض الأموال عن طريق بيع حوالات الخزينة والسندات والأوراق المالية الأخرى الى بنك الاحتياطي الفيدرالي بالتالي ان الدين العام قد تراكم على الحكومة مع الفوائد المرتبطة به المستحقة للمستثمرين الذين اشتروا هذه الأوراق المالية .

المصطلحات الرئيسة للبحث: سياسة التمويل النقدي، الموازنة العامة، الاقتصاد الامريكي، التضخم، الدين العام.
نوع البحث: بحث مستل لأطروحة دكتوراه