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Published by the Athens Institute

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The Athens Journal of Business & Economics (AJBE) is an Open Access quarterly double-blind peer reviewed journal and considers papers from all areas of business and economics, including papers on accounting, finance, management, marketing, organization etc. The AJBE welcomes theoretical (including methodological), empirical (including case-studies) and policy (i.e., descriptive and non-analytical) papers. Given the mission of Athens Institute the AJBE will also consider papers which emphasize country-related studies both at the business and the national economy level as well as economic history, history of economic thought and philosophy of economics papers. All papers are subject to Athens Institute's Publication Ethical Policy and Statement.

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President's Message

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The current issue is the second of the eleventh volume of the *Athens Journal of Business & Economics (AJBE), published by the Business & Law Division and the Economics Unit of Athens Institute.*

Gregory T. Papanikos
President
Athens Institute

Athens Institute for Education and Research

A World Association of Academics and Researchers

19th Annual International Symposium on Economic Theory, Policy and Applications 30 June & 1-3 July 2025, Athens, Greece

The Economics Unit of Athens Institute, will hold its **19th Annual International Symposium on Economic Theory, Policy and Applications, 30 June & 1-3 July 2025, Athens, Greece** sponsored by the Athens Journal of Business & Economics. The aim of the conference is to bring together academics and researchers of all areas of economics and other related disciplines. You may participate as panel organizer, presenter of one paper, chair a session or observer. Please submit a proposal using the form available (https://www.atiner.gr/2025/FORM-ECO.doc).

Academic Members Responsible for the Conference

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- Dr. Henry Thompson, Head, Economics Unit, Athens Institute & Emeritus Professor, Auburn University, USA.
- Dr. Chris Sakellariou, Head, Economics Unit & Associate Professor of Economics, Nanyang Technological University, Singapore.

Important Dates

- Abstract Submission: **20 May 2025**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **2 June 2025**

Social and Educational Program

The Social Program Emphasizes the Educational Aspect of the Academic Meetings of Athens Institute.

- Greek Night Entertainment (This is the official dinner of the conference)
- Athens Sightseeing: Old and New-An Educational Urban Walk
- Social Dinner
- Mycenae Visit
- Exploration of the Aegean Islands
- Delphi Visit
- Ancient Corinth and Cape Sounion

Conference Fees

Conference fees vary from 400€ to 2000€
Details can be found at: https://www.atiner.gr/fees

Athens Institute for Education and Research

A World Association of Academics and Researchers

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5-8 May 2025, Athens, Greece

The Business, Economics and Law Division (BLRD) of Athens Institute is organizing its **12th Annual International Conference on Business, Law & Economics, 5-8 May 2025, Athens, Greece,** sponsored by the Athens Journal of Business & Economics and the Athens Journal of Law. In the past, the six units of BLRD have organized more than 50 annual international conferences on accounting, finance, management, marketing, law and economics. This annual international conference offers an opportunity for cross disciplinary presentations on all aspects of business, law and economics. This annual international conference offers an opportunity for cross disciplinary presentations on all aspects of business, law and economics. Please submit an abstract (email only) to: atiner@atiner.gr, using the abstract submission form (https://www.atiner.gr/2025/FORM-BLE.doc)

Important Dates

- Abstract Submission: **25 March 2025**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **7 April 2025**

Academic Member Responsible for the Conference

- **Dr. Gregory T. Papanikos**, President, Athens Institute.
- **Dr. Michael P. Malloy**, Director, Business, Economics and Law Division, Athens Institute & Distinguished Professor & Scholar, University of the Pacific, USA.
- **Dr. David A. Frenkel**, LL.D., Head, Law Research Unit, Athens Institute & Emeritus Professor, Law Area, Guilford Glazer Faculty of Business and Management, Ben-Gurion University of the Negev, Beer-Sheva, Israel.

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Athens Journal of Business & Economics –
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The Effectiveness and Efficiency of the New Public Policies

*By Ioannis N. Kallianiotis**

«Πᾶσα ἐπιστήμη χωριζομένη δικαιοσύνης καί τῆς ἄλλης ἀρετῆς,
πανουργία καί οὐ σοφία φαίνεται.»
Πλάτων

In this paper we deal with the recent (1995-2023) Federal Reserve operated monetary policies, which were two unprecedented and distinct monetary policy regimes. The inflation stabilization era (1995-2008) and the zero-interest rate era (December 15, 2008-December 15, 2015) and again (March 15, 2020-March 15, 2022). These different monetary policy regimes provided various outcomes for interest rates, financial markets, inflation, cost of living, employment, international trade, and real economic growth. Then, a new fiscal policy was imposed in 2021. Some of the important, but not so beneficial results are that monetary policy appears to be able to affect long-term real interest rates, risk, the prices of the financial assets (bubbles), inflation, and very little the real economic growth. The Fed's interest rate target was set during these nine years at 0% to 0.25%. It has created a low level of long-term interest rates and the negative real rate of interest (cost of capital), due to double digit inflation. The evidence suggests that these public policies are not very effective; they have created a new bubble in the financial market, perpetuated inflation, a redistribution of wealth from risk-averse savers to banks and risk-taker speculators, and a huge social cost (bail-in and bail-out cost). This monetary policy has increased the risk (RP) to the risk-averse depositors by making the real rate of interest negative. The effects on growth and employment of both public policies (monetary and fiscal) were gradual, small, and questionable, due to exaggerated liquidity, outsourcing, unfair trade policies, the suspicious COVID-19 pandemic, liberalism, the obsession with the "environment", new wrong ideologies, which increased the cost of production and generated enormous deficits and debts.

Keywords: *Monetary Policy, Central Banks and Their Policies, Money and Interest Rates, Financial Markets and the Macro-economy, Model Evaluation and Testing, Social Welfare*

JEL (Classification): E52, E58, E4, E44, C52, D6

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Introduction: Fed's New Monetary Policy

The conception of a monetary policy regime is somewhat vague and different from a fiscal policy. It is related to the state of the economy, to Fed's experience and independence (private institution), and to the idea of a monetary standard. Examples of monetary standards include the classical gold standard[1] that existed in most developed economies between 1880 and 1914, the modified gold exchange standard adopted in 1946 after the Bretton Woods agreement (1944), and the paper money standard that evolved after the abandonment of the Bretton Woods agreement in 1971.[2] This paper examines two distinct U.S. policy regimes that were adopted to manage a paper money standard. These regimes are defined by the different goals for policy and by the different procedures, the inflation stabilization (moderation) era, 1995-2008 (2% inflation target) and the zero-interest rate (ZIR) era, 2008-2015 (quantitative easing) and 2020-2022 (the suspicious COVID-19 pandemic) used to implement monetary policy decisions.[3]

Before 2007, the Fed implemented monetary policy with *limited reserves*, non-borrowed (R^*) and borrowing (R_B) reserves, in the banking system ($R^* + R_B = R_T^S$) and relied on OMO, as its key instrument (tool). After the financial crisis of 2008, the Fed implements monetary policy with *ample reserves*, Figure 1, by using many new (antisocial) instruments[4] and it relies since October 1, 2008 on interest on reserves (IOR)[5] and since September 17, 2014, on interest on overnight reverse repurchase ($ON\ RRP$),[6] too.

The Fed with its new monetary policy that is using since October 1, 2008,[7] it has as its administered rates, (1) interest on reserves (i_{IOR}) and later, (2) interest of

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[1]The bimetallic, gold and silver, standard was abolished on January 17, 1873, with the demonetization of American silver, which became known, as the "Crime of 1873". See, Goodson (2019, pp. 70-71).

[2]See, Kallianiotis (2019).

[3]See, Bindseil (2016), Gavin (2018), Bullard (2018), and Kallianiotis (2023).

[4]Policy Tools. https://www.federalreserve.gov/monetarypolicy/policytools.htm . See, also, The Fed's New Monetary Policy Tools. https://research.stlouisfed.org/publications/page1-econ/2020/08/03/the-feds-new-monetary-policy-tools

[5]See, Federal Reserve Board - Interest on Reserve Balances

[6]See, Federal Reserve Board - Overnight Reverse Repurchase Agreement Facility

[7]In December 2008, they were, $i_{IOR} = 0.25\%$, $i_{ON\ RRP} = 0.05\%$, $i_{FF}^{eff} = 0.12\%$, and $i_{DR} = 0.50\%$. On July 26, 2022 they were, $i_{IOR} = 2.40\%$, $i_{ON\ RRP} = 2.30\%$, $i_{FF}^{eff} = 2.33\%$, and $i_{DR} = 2.50\%$. On October 21, 2022, they were: $i_{IOR} = 3.15\%$, $i_{ON\ RRP} = 3.05\%$, $i_{FF}^{eff} = 3.08\%$, and $i_{DR} = 3.25\%$. On November 7, 2022, the interest rates became: : $i_{IOR} = 3.90\%$, $i_{ON\ RRP} = 3.80\%$, $i_{FF}^{eff} = 3.83\%$, and $i_{DR} = 4.00\%$. And in October 2023, they were: $i_{IOR} = 5.40\%$, $i_{ON\ RRP} = 5.30\%$, $i_{FF}^{eff} = 5.33\%$, and $i_{DR} = 5.50\%$. See, Interest Rates, Discount Rate for United States (INTDSRUSM193N) | FRED | St. Louis Fed (stlouisfed.org). See, "Interest on Reserve Balances". https://www.federalreserve.gov/monetarypolicy/reserve-balances.htm. See also, "Effective Federal Funds Rate", https://www.newyorkfed.org/markets/reference-rates/effr. Further, "FRB Rates - discount, fed funds, primary credit", https://fred.stlouisfed.org/categories/118 and Overnight Reverse Repurchase Agreements Award Rate: Treasury Securities Sold by the Federal Reserve in the Temporary Open Market Operations | FRED | St. Louis Fed (stlouisfed.org); also, Discount Window Primary Credit Rate (DPCREDIT) | FRED | St. Louis Fed (stlouisfed.org).

overnight reverse repurchase ($i_{ON\,RRP}$), with which influences the federal funds rate (i_{FF}). The demand for reserves curve (R^d) turns flat between the new administered rates at point E_1, Figure 1, which helps to keep the i_{FF} into the $FOMC$'s target range ($5.25\% \leq \bar{\imath}_{FF} \leq 5.50\%$), and today, since September 19, 2024, it has become (4.75%<iFF<5%)".[8] With these enormous "ample" reserves,[9] the Fed does not need to make daily OMO (OMP or OMS), as it did before with the limited reserves to hit the i_{FF} target. Now, small shifts of the supply curve (R^s) have no effect on the i_{FF}. The main tool for keeping the i_{FF} on its target and driving the demand curve flat is the i_{IOR}. Banks invest their money short-term based on the interest rate and the risk. They can invest in Treasury Bills ($i_{RF} = 5.25\%$),[10] by offering loans to banks ($i_{FF}^{eff} = 5.33\%$),[11] or by depositing to the Fed ($i_{IOR} = 5.40\%$).[12] Banks prefer to deposit their money to the Fed because i_{IOR} is higher compared to the alternative S-T investments and it is also a safe overnight investment, but a bail-out cost for the taxpayers.[13] (*Sic*). If the i_{FF} were to fall very far below the i_{IOR}, banks would borrow in the federal funds market and deposit those reserves at the Fed, earning a profit (arbitrage, π_A) on the difference ($\pi_A = i_{IOR} - i_{FF}$) This arbitrage ensures that the i_{FF} does not fall much below i_{IOR}, as follows: $[EX\,D_{FF} \Rightarrow i_{FF} \uparrow \; and \;\; EX\,S_{\text{Re}serves} \Rightarrow i_{IOR} \downarrow]$

[8]See, Federal Funds Target Range - Upper Limit (DFEDTARU) | FRED | St. Louis Fed (stlouisfed.org) and Federal Funds Target Range - Lower Limit (DFEDTARL) | FRED | St. Louis Fed (stlouisfed.org) In addition, see, Overnight Reverse Repurchase Agreements Award Rate: Treasury Securities Sold by the Federal Reserve in the Temporary Open Market Operations | FRED | St. Louis Fed (stlouisfed.org)

[9]See, Graph 2e: Reserves of Depository Institutions: Total (TOTRESNS) SSOWNLOAD. With December 2008, $R_T = \$820.9$ billion, they reached $4,193.2 billion (September 2021), 31.6% p.a. growth, and today (April 23, 2024), they are $3,543.1 billion. Source: Reserves of Depository Institutions: Total (TOTRESNS) | FRED | St. Louis Fed (stlouisfed.org)

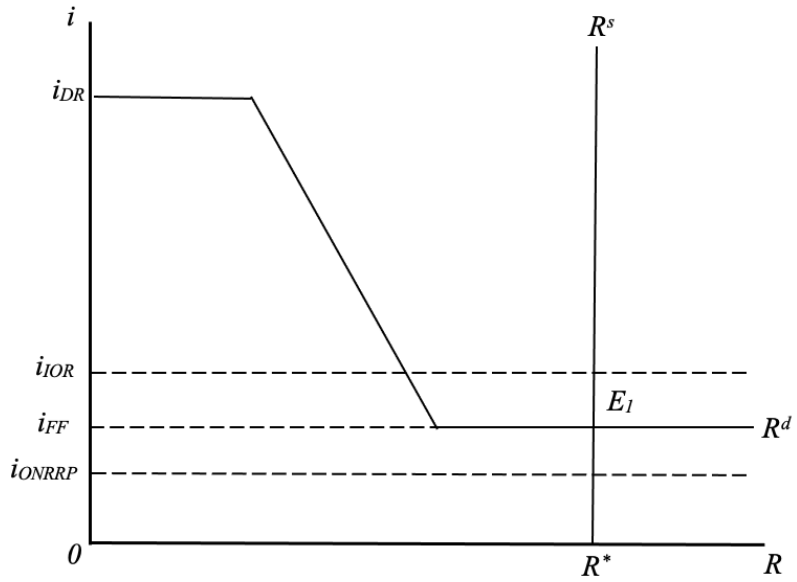
[10]The T-Bill rate in the secondary market was, $i_{RF} = 0.02\%$ on June 30, 2021 and became in one year $i_{RF} = 4.06\%$ (November 7, 2022). On (December 1, 2023), it was: $i_{RF} = 5.27\%$, and now (April 30, 2024) it is $i_{RF} = 5.25\%$. See, https://tradingeconomics.com/united-states/interest-rate and https://ycharts.com/indicators/3_month_t_bill and https://fred.stlouisfed.org/series/TB3MS. See, also, Interest Rate on Reserve Balances (IORB) | FRED | St. Louis Fed (stlouisfed.org)
In addition, see, 3 Month Treasury Bill Rate (ycharts.com)

[11]See, Effective Federal Funds Rate - FEDERAL RESERVE BANK of NEW YORK (newyorkfed.org)

[12]See, Interest Rate on Reserve Balances (IORB) | FRED | St. Louis Fed (stlouisfed.org)

[13]See, Kallianiotis (2021c).

Figure 1. *New Monetary Policy with Ample Reserves*



Note: i = interest rates, i_{FF} = federal funds rate, i_{DR} = discount rate, i_{IOR} = interest rate on reserves, i_{ONRRP}= interest rate on overnight reverse repurchase, R = reserves, R^d = demand for reserves, R^s = supply of reserves, R^* = non-borrowed reserves, E_1 = equilibrium ($R^s = R^d$).

Banks, before November 2008, were minimizing their holdings of excess reserves because $i_{IOER} = 0$. Then, with $i_{IOER} > 0$, banks have an incentive to hold more excess reserves. The i_{IOER} became a tool to influence banks to hold more excess reserves at the Fed. The Fed has since that time the i_{IOER} as a new tool for implementing monetary policy. Since November 2008, $i_{IORR} = i_{IOER}$ and since March 26, 2020, the Fed abandoned the required reserves ($R_R = 0$).[14] This interest on required reserves ($IORR$) made Fed's policy effectiveness irrelevant for banks. The Fed shifted to an ample-reserves framework and reserve requirements (r_R) are not anymore, a tool of monetary policy. Thus, now, we have only IOR (i_{IOR}), which it is a new tool of monetary policy. The reserves are still remained "ample",[15] Figure 1.

[14]See, "Reserve Requirements", https://www.federalreserve.gov/monetarypolicy/reservereq.htm. Also, "The Financial Services Regulatory Relief Act of 2006 authorized the Federal Reserve Banks to pay interest on balances held by or on behalf of eligible institutions in master accounts at Reserve Banks, subject to regulations of the Board of Governors, effective October 1, 2011. The effective date of this authority was advanced to October 1, 2008, by the Emergency Economic Stabilization Act of 2008." See, "Interest on Reserve Balances", https://www.federalreserve.gov/monetarypolicy/reserve-balances.htm

[15]In January 2019, the FOMC released a statement saying, it would continue to implement policy with ample reserves in the long run. See, Board of Governors of the Federal Reserve System. "Statement Regarding Monetary Policy Implementation and Balance Sheet Normalization." Press release, January 30, 2019; https://www.federalreserve.gov/newsevents/pressreleases/monetary20190130c.htm. More recently, in response to the COVID-19 pandemic, reserves have grown substantially. By May 2020, reserves expanded and stood above $3.218 trillion, at a higher level than their peak during the aftermath of the Great Recession; on January 28, 2021, they were $3.135

Thus, when there is a large quantity of reserves in the banking system, as it is lately, Figure 1 and Graph 2e, the Fed can no longer influence the i_{FF} by making small changes in the supply of reserves (R^s). Why we need all these non-borrowed reserves (R^*)? What was the reason of this idle enormous liquidity with the economy lockdown, businesses had no workers because of the vaccine mandates, a vast demand for imports (Graph 6),[16] a supply chain problem, and a very anemic AD? Why the taxpayers have to pay billions of dollars to the corrupted banks for keeping these idle excess reserves? Why the depositors have to earn zero deposit rate and to pay a high real deposit rate (bail-in cost) to banks? Is this policy efficient, fair, ethical, or social? All this money supply (Graph 3) and the government spending (Graph 4) caused the enormous double-digit inflation $\pi = 18\%$,[17] and an official[18] $\pi = 9.1\%$, which is already, here and will stay for a long time, Figure 3 and Graph 9. How will we control the bubble[19] (Figure 2) in the financial market? The market manipulators and the insiders will start taking advantage of this situation, as already are doing. All these have generated an unfair huge social cost and an uncertain future.

In conclusion, when the Fed raises or lowers the i_{IOR}, the i_{FF} moves up or down, too. Consequently, the Fed can keep the i_{FF} into the target range set by the *FOMC* through adjustment of the i_{IOR}. The Fed sets the i_{IOR} directly, so this interest rate serves as an effective monetary policy tool. Now, this i_{IOR} [20] is the *primary tool* used by the Fed for influencing the i_{FF}, Figure 1. The old tools were satisfied the same objective without charging citizens with any cost, as they have to pay, now, the IOR (bail out cost to taxpayers of hundreds of billions of dollars per annum).[21] In 2014, the *FOMC* announced that it will use the Overnight Reverse Repurchase Agreement

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trillion; on February 23, 2021, they were $3.154 trillion; on March 23, 2021 became $3.346 trillion; on June 28, 2022, they became $3.318 trillion, on July 26, 2022 they fell to $3,228.4 billion, on September 27, 2022, they became $3,305.9 billion, on October 24, 2023, they were $3,239.4 billion, on April 23, 2024, they were $3,543.1 billion and now, (June 25, 2024), they were $3,376.2 billion. (Graph 2e). https://fred.Stlou isfed.org/series/TOTRESNS

[16]See, **"United States Imports",** https://tradingeconomics.com/united-states/imports. **See also,** "List of imports of the United States", https://en.wikipedia.org/wiki/List_of_imports_of_the_United_States. Further see, "What Are the Top 10 U.S. Imports?", https://traderiskguaranty.com/trgpeak/what-are-the-top-10-u-s-imports/

[17]See, SGS, http://www.shadowstats.com/alternate_data/inflation-charts

[18]See, Stephen Miller, "U.S. Inflation Rate Reaches 8.6% in May, a 40-Year High, Pushing Wages Up". In June 2022, the CPI rose 9.1% and the PPI rose 10.8%. https://www.shrm.org/resourcesandtools/hr-topics/compensation/pages/annual-inflation-hit-40-year-high-in-may.aspx. The inflation for some foods it is over 100%. For example, 3 litters of olive oil was priced $28.99, now it is $58.99. Gas from $1.90 a gallon, it is now $4.75/gallon. A packet of spaghetti was $1 and its now $2.50. It is obvious that the official numbers have become political numbers. The official inflation with March 2024 was: $\pi = 3.5\%$ and with June fell to 3%. How can people trust these artificial political numbers? Current US Inflation Rates: 2000-2024 (usinflationcalculator.com)

[19]See, Stockman (2022). See, Dow Jones - DJIA - 100 Year Historical Chart | MacroTrends

[20] See, Board of Governors of the Federal Reserve System. "Interest on Required Reserve Balances and Excess Balances". https://www.federalreserve.gov/monetarypolicy/reqresbalances.htm

[21]For now (April 2024), taxpayers have a bail-out cost of $191.327 billion per annum. See, Kallianiotis (2021a).

Facility ($ON\ RRP$)[22] to help control the i_{FF}. This facility is a form of OMO, where the Fed interacts with many nonbank financial institutions (large money market funds and government-sponsored enterprises).[23] When one nonbank financial institution uses the $ON\ RRP$ facility, it deposits reserves at the Fed overnight receiving securities as collateral. The next day the transaction is "unwound";[24] the Fed buys back the securities, and the institution earns the $i_{ON\ RRP}$, which the Fed sets, on the cash that the nonbanks deposited at the Fed (another bail out cost[25] discussed by Kallianiotis (2021a). This investment facility is a risk-free option and these institutions are willing to lend funds to this relatively low rate, the $i_{ON\ RRP}$, but not lower. For this reason, the $i_{ON\ RRP}$ acts as a reservation rate and institutions can use it to arbitrage other short-term rates. Thus, the interest rate paid on $ON\ RRP$ transactions and it is below the i_{IOR}, acts like a floor for the i_{FF} and serves as a *supplementary policy tool* by the Fed, Figure 1.

The Exaggerated Liquidity in Graphs and Numbers and its Effects on the Economy

Between January 2008 (from $880.754 billion) and the end of the financial crisis in May 2009, the Federal Reserve's balance sheet increased by 150%, swelling to $2.196 trillion (Graph 1).[26] Since then, the balance sheet has increased by an

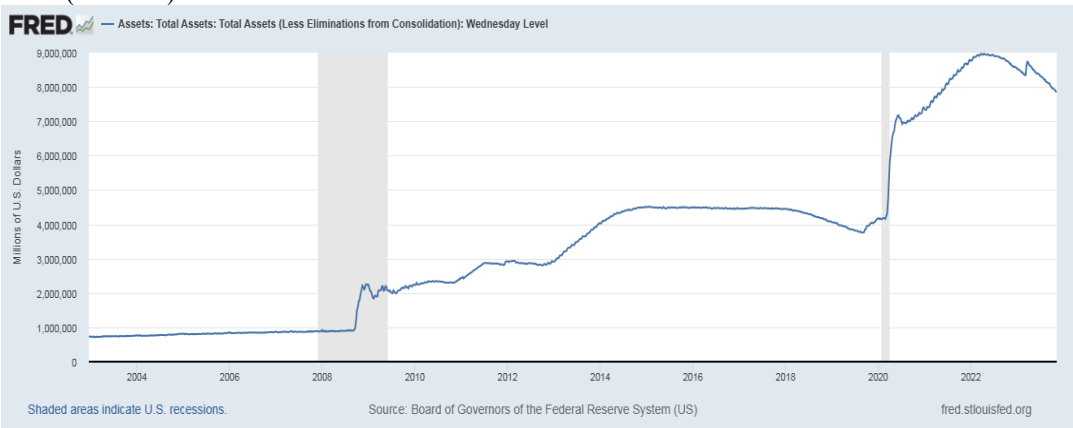
[22]See, Board of Governors of the Federal Reserve System. "Overnight Reverse Repurchase Agreement Facility". https://www.federalreserve.gov/monetarypolicy/overnight-reverse-repurchase-agreements.htm.

1. [23]See, "What Is a Money Market Fund?", https://www.investopedia.com/investing/do-money-mar ket-funds-pay/ and "Government-Sponsored Enterprise (GSE)", https://www.investopedia.com/ter ms/g/gse.asp. See also, Federal Reserve Bank of New York, "Reverse Repo Counterparties". https:// www.newyorkfed.org/markets/rrp_counterparties.

1.1 [24]Unwind = To close out a relatively complicated investment position.

[25]With May 2, 2024, the ON RRP were $428.68 billion and the $i_{ON\ RRP} = 5.30\%$. Then, their bail out cost is: $22.72 billion per annum. FAQs: Reverse Repurchase Agreement Operations - FEDERAL RESERVE BANK of NEW YORK (newyorkfed.org)

[26]Graph 1: Assets: Total Assets: Total Assets (Less Eliminations from Consolidation): Wednesday Level (WALCL)



additional $2.2 trillion and by July 2014, it had become $4.4 trillion. It consisted of $2.46 trillion in Treasuries, $26.81 billion in agency debt, and $1.76 trillion in mortgage-backed securities. The highest value was on January 14, 2015: $4.516 trillion and on August 14, 2019, it was $3,337.347 billion. The total banks' reserves ($R_R + R_E$) were $200.608 billion and $1,386.237 billion respectively, a total of $1,586.845 billion. Lately, they are going up again. On November 8, 2023, they were $7.909 trillion: $4.873 in government securities and $2.463 trillion in mortgage-backed securities (plus other factors of $0.573 trillion).[27]

Over four rounds of "quantitative easing" (QE) in 2008, 2010, 2012, and 2014, the Fed purchased a huge amount of assets such as U.S. Treasury debt and agency mortgage-backed securities and continued with the same policy until 2022 (Graph 1 and Graph 2e). As the Fed was buying these assets, the banks that were selling them saw their excess reserve (R_E) balances to become enormous and the total monetary base was increasing. Actually, it continues going up until December 2021, where the total monetary base reached $6,413.100 billion; a growth since 2008 by $5,503.4 billion or 604.969% or 46.536% per annum (Graph 2a).[28] This monetary policy cannot be efficient and socially necessary. As a result, excess reserves held by depository institutions reached $2,699.968 billion by August 2014. To put that in

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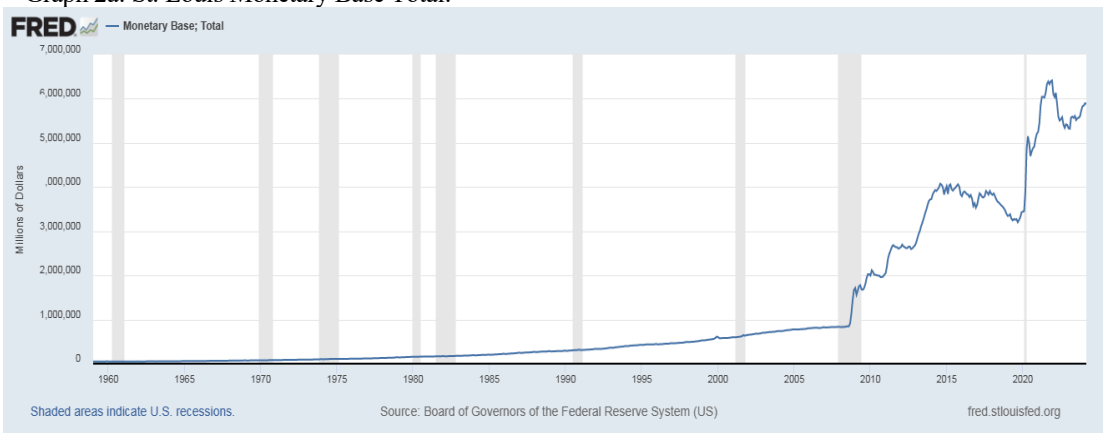
Note: The total assets were, on December 7, 2023, were: $7,737.385 billion. With May 2, 2024, they were $7,362.474 billion and with July 18, 2024, they were $7,208.247 billion. Source: Assets: Total Assets: Total Assets (Less Eliminations from Consolidation): Wednesday Level (WALCL) | FRED | St. Louis Fed (stlouisfed.org)

[27]See, See, "Federal Reserve Balance Sheet: Factors Affecting Reserve Balances - H.4.1", Federal Reserve Balance Sheet: Factors Affecting Reserve Balances - H.4.1 - November 09, 2023

[28]Graph 2a: St. Louis Monetary Base Total:

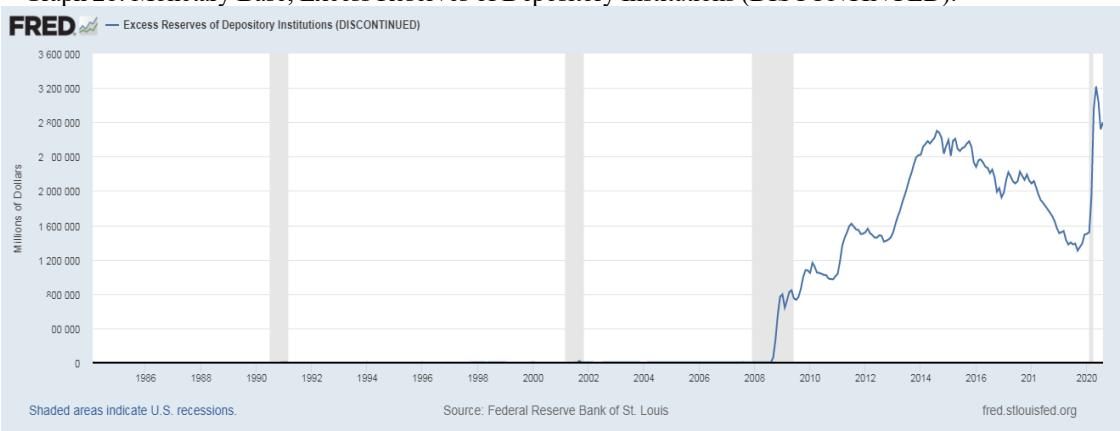


Note: Monetary base was on September 10, 2008: $874.83 billion; December 31, 2008: $1,690.829 billion; February 24, 2010: $2,183.734 billion; February 22, 2012: $2,753.052 billion; September 17, 2014: $4,149.829 billion; April 15, 2015: $4,167.780 billion; on June 14, 2019: $3,304.252 billion; on August 14, 2019: $3,331.637 billion; on December 19, 2019 it was $3,441.873 billion (reserves: $1,649.453 billion and currency: $1,792.420 billion); on October 24, 2023, MB was $5,567.1 billion; on November 28, 2023 went up to $5,601.3 billion. On May 4, 2024, it became $5,883 billion and on June 25, 2024, fell to $5,725.3 billion.

Source: Monetary Base; Total (BOGMBASE) | FRED | St. Louis Fed (stlouisfed.org). In addition, see, Monetary Base; Total (BOGMBASE) | FRED | St. Louis Fed (stlouisfed.org) Further, see, https://fred.stlouisfed.org/series/BASE/ See, also, https://research.stlouisfed.org/ datatrends/usfd/page7.php https://www.federalreserve.gov/releases/h3/current/

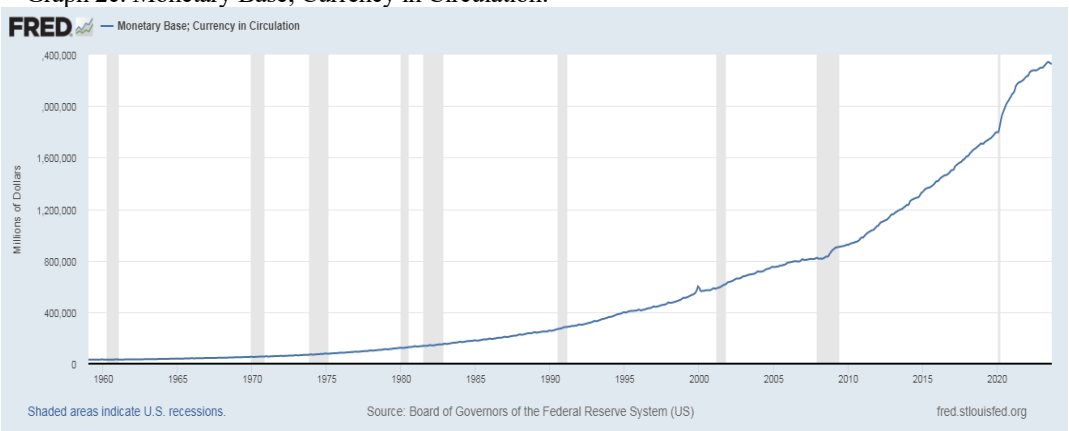
perspective, in the pre-crisis years, by August 2008 they were $1.876 billion; in December 2008 became $767.319 billion; in February 2010, they were $1,161.852 billion; in July 2011 became $1,618.118; in August 2014, they reached $2,699.968 billion; and then, they started to decline and were in May 2019: $1,376.568 billion (Graph 2b).[29] In July 2019, they were $1,378.447 billion. In December 2019, the monetary base was $3,382.800 billion, the currency in circulation was $1,786.231 billion, the required reserves (R_R) were $206.586 billion, and the excess reserves (R_E) were $1,388.636 billion, also some other reserves of $1.347 billion and continue to grow. (Graphs 2a, 2b, 2c, 2d, and 2e).[30] The money supply (M2) has surpassed all its

[29] Graph 2b: Monetary Base; Excess Reserves of Depository Institutions (DISCONTINUED):



Note: With December 30, 2019, they continue to growth to R_E = $1,491.106 billion and with August 2020 they were $2,799.719 billion, where they were discontinued to keep statistics.
Source: https://fred.stlouisfed.org/series/EXCSRESNS

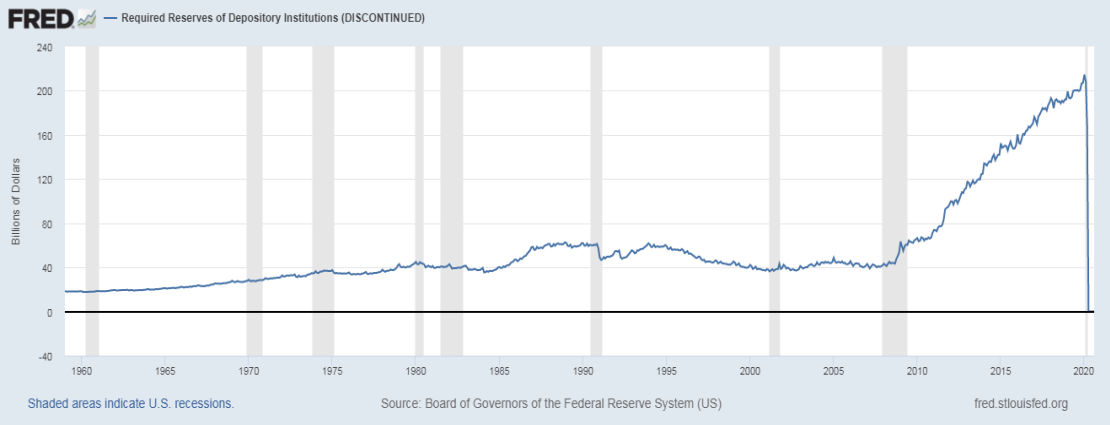
[30] Graph 2c: Monetary Base; Currency in Circulation:



Note: With December 30, 2019, C = $1,796.397 billion, with October 24, 2023 had reached $2,327.7 billion, on November 28, 2023, it was C=$2,324.9 billion, with May 2024, it reached $2,339.9 billion and in June 25, 2024 had become $2,349.1 billion Source: https://fred.stlouis fed.org/series/MBCU RRCIR

Graph 2d: Monetary Base; Required Reserves of Depository Institutions (DISCONTINUED):

limits (Graph 3), [31] from $7,502.6 billion (January 2008) reached $21,577 billion (June 2022), a growth by $14,074.4 billion or 187.59% od 13.4% per annum; and the

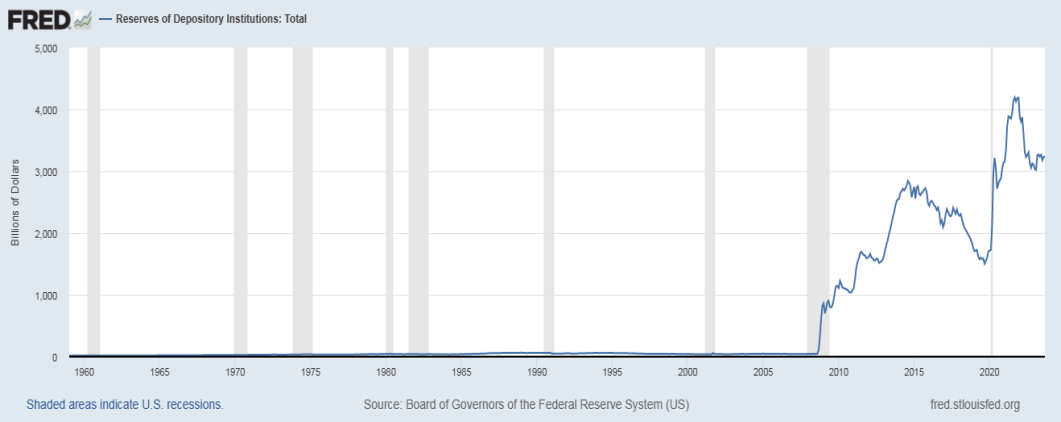


Note: With December 30, 2019, R_R = $207.24 billion and lately, R_R = $167.36 billion (April 9, 2020). In August 2020 became zero ($R_R = 0$).

Source: https://fred.stlouisfed.org/series/REQRESNS

Graph 2e: Reserves of Depository Institutions: Total (TOTRESNS) SSOWNLOAD

Observation: March 2024: $3,543.1(+ more). Updated: April 23, 2024

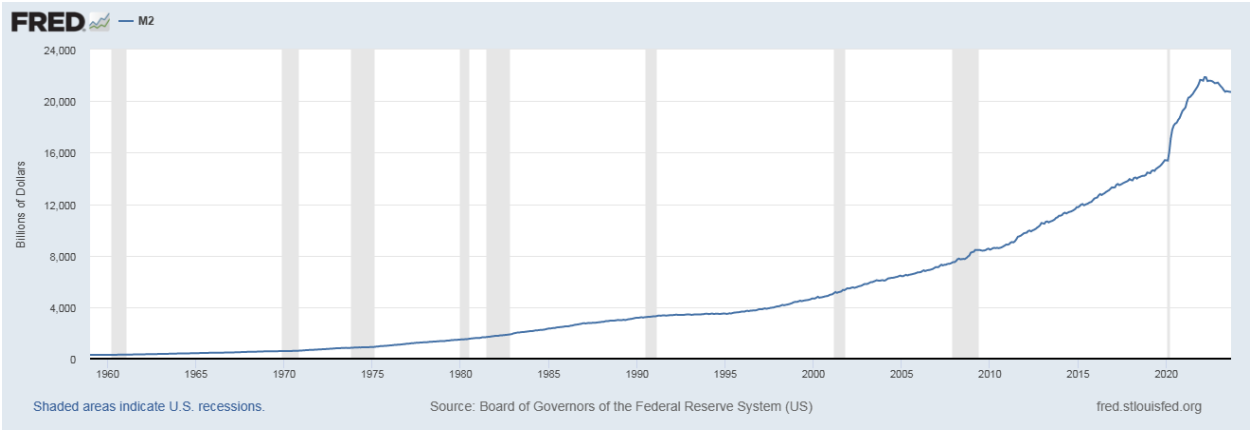


Note: With December 2008, $R_T = \$820.9$ billion, it reached $4,193.2 billion (September 2021), 31.6% p.a. growth, and on April 23, 2024, they were $3,543.1 billion. On June 25, 2024, they fell to $3,376.2 billion.

Source: Reserves of Depository Institutions: Total (TOTRESNS) | FRED | St. Louis Fed (stlouisfed.org)

[31]Graph 3: Money Supply, M2 (M2NS)

DJIA had reached 39,807.37 on March 28, 2024 from 6,547.05 on March 9, 2009, a growth by 33,260.32 points or 508.02% or 33.868% p.a. (Figure 2). Is this 33.868% p.a. growth of the stock prices[32] due to high risk (RP) or due to excess liquidity (Fed's policy)? Does this bubble bode a new financial crisis? Yes; but, the world's planners found another way to cause a deeper crisis, the more effective and suspicious coronavirus. Then, inconsiderate government expenditures went up drastically since 2020 (Graph 4)[33] raising together the national debt (Graph 5 and Figure 4).[34]

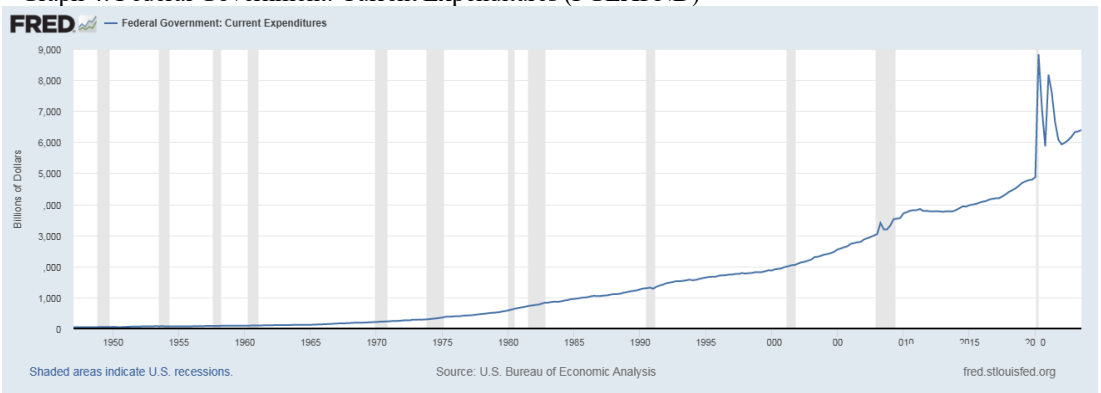


Note: With December 30, 2019, M2 = $15,427.9 billion, with April 9, 2020 reached M2 = $16,668.9 billion, with October 24, 2023, the M2 was $20,699.3 billion, on November 28, 2023, it was M2 = $20,671.1 billion, and on April 23, 2024, it increased to M2=$20,981.9 billion. Now, with June 25, 2024, it was reduced to $20,851.9 billion.

Source: M2 (M2NS) | FRED | St. Louis Fed (stlouisfed.org)

[32]In 2019, the stock market (DJIA) must had grown by 9.886% p.a. ($= \bar{\iota}_{RF} + \overline{HRP} = 0.986\% + 8.9\%$). See, Ross, Westerfield, Jaffe, and Jordan (2022, p. 311). Then, today (12/13/2023), the growth of the DJIA must be: $g_{DJIA} = 5.32\% + 8.9\% = 14.22\%$.

[33]Graph 4: Federal Government: Current Expenditures (FGEXPND)



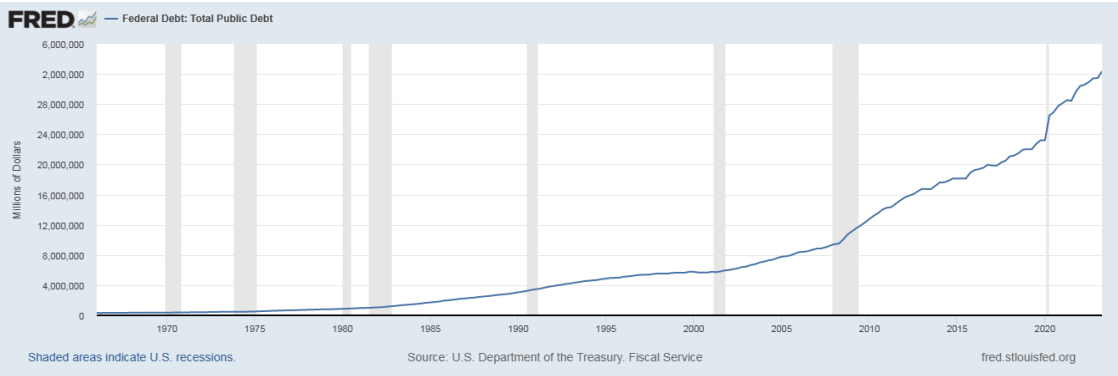
Note: On April 25, 2024, it was G = $6,591.274 billion and on June 27, 2024, they became $6,599.198 billion.

Source: Federal Government: Current Expenditures (FGEXPND) | FRED | St. Louis Fed (stlouisfed.org)

[34]Graph 5: Federal Debt: Total Public Debt (GFDEBTN):

Unfortunately, the most inefficient institution in the country is the Federal government.[35] The unfair trade deficit is going up, too (Graph 6).[36] Fed also went back to a new zero federal funds rate, on March 16, 2020, to cope with the new created economic crisis.[37]

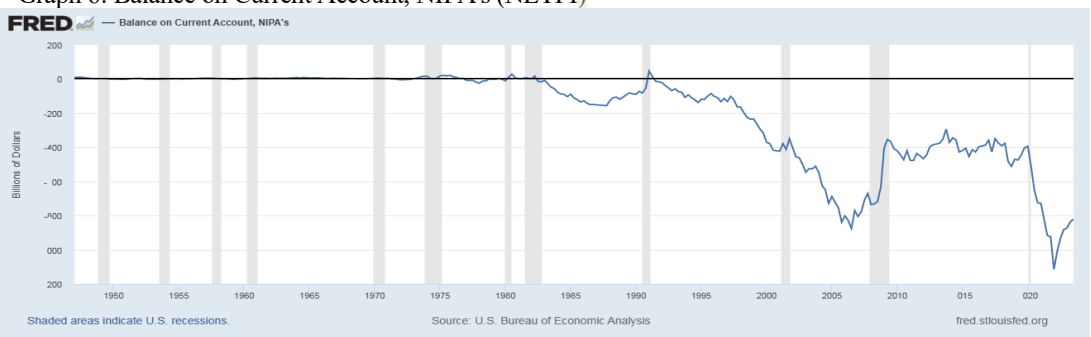
Figure 2. *The U.S. Dow Jones Industrial Average*



Note: With May 6, 2024, the ND was $34,714 billion, 122.25% of the GDP. With July 19, 2024, it had reached $34,946 billion, https://www.usdebtclock.org/
Source: Federal Debt: Total Public Debt (GFDEBTN) | FRED | St. Louis Fed (stlouisfed.org)

[35]The corruption, the control, and the ineffectiveness of all governments (the establishment, the deep swamp) are known since the French Revolution (the Jacobins) in 1789.

[36]Graph 6: Balance on Current Account, NIPA's (NETFI)



Note: With 2023:Q3, the CA = -$820.286 billion and with 2023:Q4 became -$794.265 billion and it is going up, with 2024:Q1, it was -$868.142 billion. NAFTA and China's join to WTO have deteriorated the U.S. Trade Account (Current Account). Then, these two actions were unfair policies for the U.S. economy.
Source: Balance on Current Account, NIPA's (NETFI) | FRED | St. Louis Fed (stlouisfed.org) and The U.S. Trade Deficit: How Much Does It Matter? | Council on Foreign Relations (cfr.org)

[37]The new target federal funds rate was again: $0.00\% \leq \bar{\imath}_{FF} \leq 0.25\%$ and the effective: $i_{FF}^{eff} = 0.05\%$. See, Fed Funds Target Rate History (Historical) (fedprimerate.com)

Note: USDJIA = U.S. Dow Jones Industrial Average. In 2009:03, the DJIA was 6,547.05 and on February 12, 2020 reached 29,551.42; a growth by 23,004.37 points or 351.37% (32.18% per annum). The pick point was on January 4, 2022 (DJIA = 36,799.65); a growth from March 9, 2009 by 30,252.6 points or 462.09% or 39.33 p.a. Then, a new pick on March 28, 2024 (DJIA = 39,807.37), which is a growth by 33,260.32 points or 508.02% or 33.868% p.a. since the trough of March 9, 2009, and on July 16, 2024, it reached 40,954.48, a new growth of 35.033% p.a. The most dangerous bubble in the American financial market.

Source: Dow Jones - DJIA - 100 Year Historical Chart | MacroTrends

and Dow Jones Industrial Average (^DJI) Stock Historical Prices & Data - Yahoo Finance

Also, the average maturity of assets on the Fed's balance sheet rose as the FOMC rebalanced the portfolio, substituting long-term assets for short-term ones.[38] In October 2008 (ἡ ἀποφράς ἡμέρα),[39] the Federal Reserve had begun to pay interest on reserves (IOR).[40] The IOR was set at the top of the federal funds target range and

[38]With 12/25/2019, they were: (1) Bills: $164.167 billion; (2) Notes and Bonds: $2,159.857 billion; (3) Mortgage-backed securities: $1,420.886; and (4) Other assets: $462.392 billion; Total: $4,207.302 billion. With May 1, 2024, they became: (1) Bills: $195.143 billion; (2) Notes and Bonds: $3,874.914 billion; (3) Mortgage-backed securities: $2,372.049; and (4) Other assets: $901.275 billion; Total: $7,343.381 billion. On July 17, 2024, they came down very little; Government Securities: $4,431.899 billion, Mortgage-backed Securities: $2,335.969, and Other Assets: $500.163 billion (Foreign Currency, SDRs, Gold, etc.) See, https://www.federalreserve.gov/releases/h41/current/h41.pdf

When $D_{L-T} \uparrow \Rightarrow P_{L-T} \uparrow \Rightarrow i_{L-T} \downarrow$ and if $D_{S-T} \downarrow \Rightarrow P_{S-T} \downarrow \Rightarrow i_{S-T} \uparrow$. This is the reason that the Yield Curve is negatively slopped.

[39]The ill-omened day for our economic history because of its immense negative effects on social welfare and its global effects, due to contagion (globalization).

[40]Interest on reserves (IOR=IORR+IOER) is the rate at which the Federal Reserve Banks pay interest on idle reserve balances, which are balances held by depository institutions at their local Reserve Banks. One component of IOR is Interest on Required Reserves (IORR), which is the rate at which the Federal Reserve Banks pay interest on required reserve balances (R_R). Paying interest on required reserves aims to eliminate the opportunity cost that depository institutions incur by not investing required reserves in interest-bearing assets (Graph 2d); but all these interests are paid by the taxpayers. The other component of IOR is Interest on Excess Reserves (IOER), Graph 2b, which is the interest paid on those balances (R_E) that are above the level of reserves the depository

remained about 20 basis points above the discount rate on 3-month Treasury bills ($i_{IOR} = i_{RF} + 0.20\%$).[41] This was a factor that increased banks' willingness to hold a large stock of excess reserves. Interest rates paid on other short-term financial securities (for example, commercial paper and Treasury bills), often move up or down roughly in parallel with the funds rate. Yields on long-term assets (i. e., corporate bonds and Treasury notes), are determined in part by expectations for the fed funds rate in the future. These enormous federal funds cannot be absorbed by banks because there is no sufficient demand for investments (Graph 7)[42] and for this reason, they

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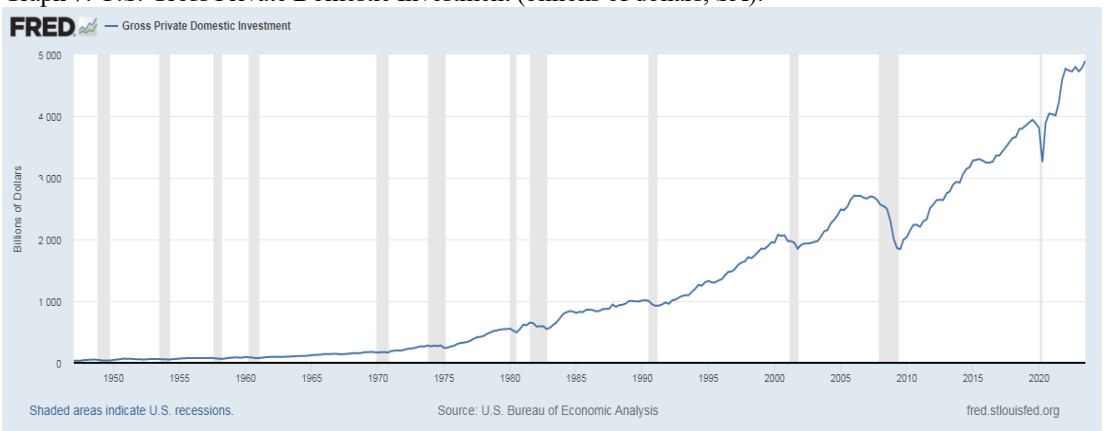
institution were required to hold. Paying IOER increases the incentive for depository institutions to sell securities to the Fed, providing the Federal Reserve additional control over the effective federal funds rate (i_{FF}^{eff}) at the time that demand for loans is low (Graph 8). But, as it was mentioned, these IOR are paid by the poor taxpayers (bail-out cost). (Sic). See, Kallianiotis (2022).

1.1.1 [41]*During the Zero Interest Rate Regime (2008:12-2015:11), on the average this* i_{IOR} *was:* $\bar{i}_{IOR} = \bar{i}_{RF} + 0.20\% = 0.078\% + 0.20\% = 0.278\%$ *[Kallianiotis (2020a, Table A1)]. This rate was on August 1, 2019,* $i_{IOR} = 2.10\%$. *Since 7/27/2023, the* $i_{IOR} = 5.40\%$. *Interest on Reserve Balances, https://www.federalreserve.gov/monetarypolicy/reserve-balances.htm. Then, if banks were receiving interest (2.10% = 1.90% + 0.20%) from the Fed, why to pay interest on deposits? They do not need more funds from depositors as long as the Fed provides this enormous liquidity (R*). Banks kept a deposit rate closed to zero (*$i_D = 0.05\%$*), which was giving a negative real deposit rate (*$r_D = -1.536\%$*). In January 2020,* $r_D = -2.25\%$*). On October 2023, it was* $r_D = -3.6\%$. *Now, November 2023, with the official inflation it was* $r_D = -2.1\%$*) and with SGS, it was* $r_D = -11.00\%$*). This is another proof that the Fed has failed (or it has no interest) to maximize the depositors' interest income and consequently, their welfare. Fed is supplying these trillions of dollars reserves (Graph 2e) to banks and because there is no demand for investments (Graph 7), banks cannot offer loans (Graph 8), so they do not need all these excess reserves. Thus, the Fed offers to banks a high interest rate to avoid the opposition of the banks against this QE policy. (Sic). See, Kallianiotis (2020b). Depositors are paying interest, instead of receiving, on their bank accounts (*$r_D < 0$*). (Sic). These are true anti-social policies.*

Graph 7: U.S. Gross Private Domestic Investment (billions of dollars, SA):



Note: In 2007:Q2, it was I = $2,697.217 billion; in 2009:Q3, I = $1,841.416 billion and until 2013 it was below the 2007 level. In 2019:Q3, I = $3,744.607 billion, in 2019:Q4, I = $3,698.273 billion, on October 26, 2023, it was I = $4,899.337 billion, on 2024:Q1, it was I = $5,006.854 billion, and on June 27, 2024 it had become $5,020.538 billion.

Source: https://fred.stlouisfed.org/series/GPDI

[42] The demand for investments depends on the demand for goods by the Americans and their demand depends on their income and employment, which depend on domestic production. With the

cause only bubbles in the financial market and preparing the environment for the 2nd global financial crisis of the 21st century (enormous liquidity, which is offered to financial investors by using margin accounts with $r_m = 50\%$) and keep the deposit rate closed to zero. The QE programs flooded the banking system with liquidity and made it less necessary for banks to borrow in the federal funds market or to supply deposit accounts.[43] Therefore, this policy is not only inefficient and ineffective, but bad (risky and unfair) for depositors, taxpayers, and the real economy (our financial system and inflationary).[44]

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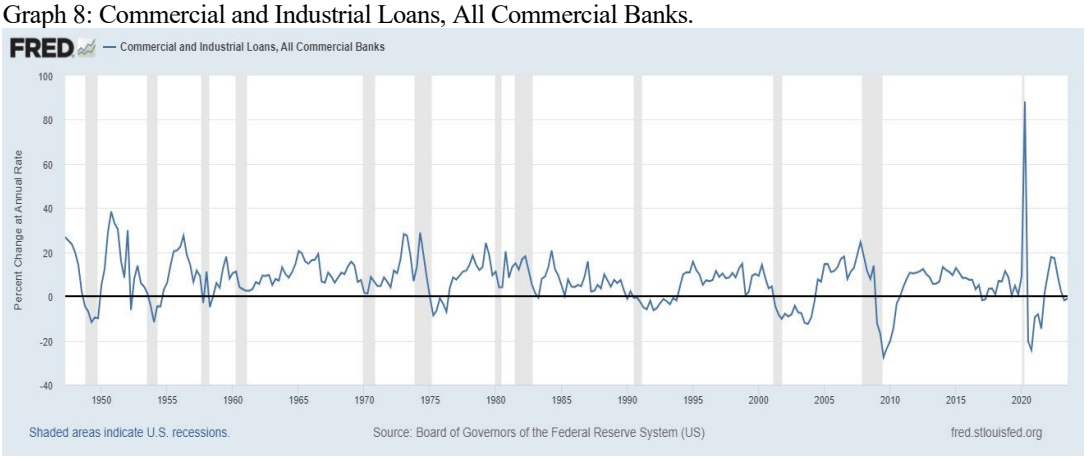
outsourcing ("the allies first"), this production has gone abroad, and the income of Americans has fallen and unemployment is very high. The domestic aggregate demand can increase only if manufacturing and agricultural production and jobs will come back to the country. Then, we need, here, a fiscal and a trade policy to improve these conditions. Monetary policy does not work by itself. The liberal central bank is in favor of only liberals agenda for the country: Russia => Racism => Recession => Revenge (against the country) => Reproach (climate) => Refer to (impeachment) => Restraint (globalization) => Coronavirus => liberal indoctrination in education. The establishment allowed for 29 years (since 1994) an unfair trade with the emerging markets and the country (the entire western economies) is suffering. The fake news is exposing the lies in the tariff fight with China and affects negatively the financial market. (*Fox News*, August 23, 2019). The demand for bank loans has declined, as Graph 8 shows.

Graph 8: Commercial and Industrial Loans, All Commercial Banks.



Note: With 2023:Q3, loans fell by -1.0% p.a. , with 2024:Q1, they fell by -1.7% and with 2024:Q2 went up by +1%.

Source: https://fred.stlouisfed.org/series/CILACBQ158SBOG

[43]Banks supply deposits (deposit accounts) and depositors are demanding deposit accounts. Deposits are supply-determined (a downward negatively sloped supply curve) by the banks. See, Hadjimichalakis (1982, p.3).

[44]See, Graph 9: Consumer Price Index for All Urban Consumers: All Items in U.S. City Average (CPIAUCSL)

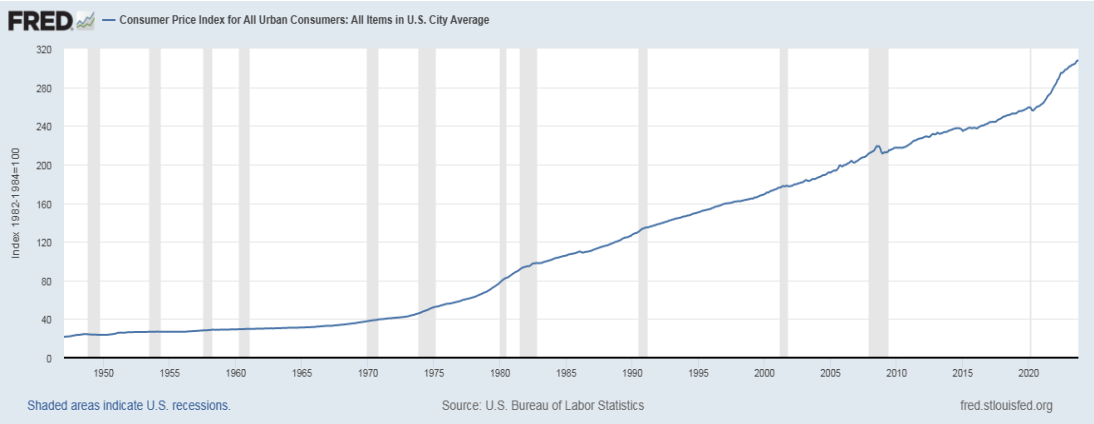
Meanwhile, domestic institutions have been charging fees to discourage large investors from making large deposits with them. As it was mentioned above, the deposit rate on small deposits is closed to zero since 2008, which makes the real deposit rate negative (depositors are paying the banks to keep their deposits). Thus, risk-averse depositors have been forced to avoid depositing their money to banks and to buy risky financial assets ($RP_{DJIA} = \bar{g}_{DJIA} - \bar{R}_{RF} = 39.33\% - 0.799\% = 38.531\%$).[45] These changes in private Fed's monetary policy overturn and invalidate its ultimate objective, which is the prevention of financial crises and the improvement of social welfare.

Testing the Effectiveness and Efficiency of the New Monetary Policy

We use OLS equations to test the effectiveness of the instruments of monetary policy (i_{FF}^{eff}, mb, and m^s) on the goal variables ((p, u, $rgdp$, i_{10YTB}, $djia$, and ta) by taking them one by one as dependent variables and the remaining of them as independent, too. This will be as a test of interdependence of the objective variables and their effect from the policy tools.

$$djia_t = \alpha_0 + \alpha_1 djia_{t-1} + \alpha_2 rgdp_{t-1} + \alpha_3 i_{10YTB_{t-1}} + \alpha_4 p_{t-1} + \alpha_5 u_{t-1} + \alpha_6 ta_{t-1} + \alpha_7 i_{FF_t}^{eff} + \alpha_8 mb_t + \alpha_9 m_t + \varepsilon_t \quad (1)$$

$$rgdp_t = \beta_0 + \beta_1 djia_{t-1} + \beta_2 rgdp_{t-1} + \beta_3 i_{10YTB_{t-1}} + \beta_4 p_{t-1} + \beta_5 u_{t-1} + \beta_6 ta_{t-1} + \beta_7 i_{FF_t}^{eff} + \beta_8 mb_t + \beta_9 m_t + \varepsilon_t \quad (2)$$



Note: The official CPI was 204.813 (November 2008) and reached 312.23 (April 10, 2024), a growth of 52.446% or an average growth of 3.42% per annum. With July 11, 2024, the CPI was 313.049 an average growth of 3.3% p.a.
Source: Consumer Price Index for All Urban Consumers: All Items in U.S. City Average (CPIAUCSL) | FRED | St. Louis Fed (stlouisfed.org)

[45]These are the average rates from 2008:12 to 2023:09. This is an indication that our public policies have made our financial market very risky. The average $HRP = 8.9\%$ and the recent one was the unacceptable $HRP = 38.531\%$. (*Sic*).

$$i_{10YTB_t} = \gamma_0 + \gamma_1 djia_{t-1} + \gamma_2 rgdp_{t-1} + \gamma_3 i_{10YTB_{t-1}} + \gamma_4 p_{t-1} + \gamma_5 u_{t-1} + \gamma_6 ta_{t-1} + \gamma_7 i^{eff}_{FF_t} + \gamma_8 mb_t + \gamma_9 m_t + \varepsilon_t \quad (3)$$

$$p_t = \delta_0 + \delta_1 djia_{t-1} + \delta_2 rgdp_{t-1} + \delta_3 i_{10YTB_{t-1}} + \delta_4 p_{t-1} + \delta_5 u_{t-1} + \delta_6 ta_{t-1} + \delta_7 i^{eff}_{FF_t} + \delta_8 mb_t + \delta_9 m_t + \varepsilon_t \quad (4)$$

$$u_t = \lambda_0 + \lambda_1 djia_{t-1} + \lambda_2 rgdp_{t-1} + \lambda_3 i_{10YTB_{t-1}} + \lambda_4 p_{t-1} + \lambda_5 u_{t-1} + \lambda_6 ta_{t-1} + \lambda_7 i^{eff}_{FF_t} + \lambda_8 mb_t + \lambda_9 m_t + \varepsilon_t \quad (5)$$

$$ta_t = \mu_0 + \mu_1 djia_{t-1} + \mu_2 rgdp_{t-1} + \mu_3 i_{10YTB_{t-1}} + \mu_4 p_{t-1} + \mu_5 u_{t-1} + \mu_6 ta_{t-1} + \mu_7 i^{eff}_{FF_t} + \mu_8 mb_t + \mu_9 m_t + \varepsilon_t \quad (6)$$

We test the effectiveness and efficiency of monetary variables (instruments) before the global financial crisis, inflation stabilization era (1995:01-2008:11) and then, during the new monetary policy regime (2008:12-now) on the objective macro-variables. The empirical results of the OLS equations appear in Tables A1 and A2.

Testing of the New Public Policies

Different public policies play critical roles in developing sustainable economic stability (in financial markets and the real sector) in the country, which their effectiveness and efficiency can create an environment of balance and symmetry for faster economic growth and larger social welfare. Monetary and fiscal policies are the fundamental components for promoting sustainable growth in the economy. The successful functioning of an economy depends on the coordinated activities of monetary and fiscal policies and the absence of this coordination leads to a poor overall economic performance. Lately, since 2009, we had an enormous liquidity, Graph 4, from the Fed and since 2021, a huge spending spry by the government, Graphs 4 and 5. These new policies are conducted by two separate authorities (central bank and government), they are mutually dependent, but both inefficient and ineffective, and therefore, their accomplishment is consistent by contributing to high inflation and bubble in the financial markets, thus, causing high social cost, Figures 2 and 3. There was no harmonized monetary and fiscal policy and we did not avoid inconsistencies.

Fiscal policy deals with the public expenditures and revenues and both were increasing by the liberal Biden's administration (Bidenomics).[46] Pragmatic and effective fiscal stance promotes economic growth without inflation pressure, low levels of fiscal deficit and public debt,[47] narrow down budget imbalances in situations

[46]"But what Joe Biden has done to our once great nation is ***DISGUSTING: #1*** OPEN BORDERS, ***#2*** MIGRANT CRIME, ***#3*** RECORD LEVEL INFLATION, ***#4*** ELECTION INTERFERENCE, ***#5*** CENSORSHIP AND INDOCTRINATION, ***#6*** DEEP STATE CORRUPTION, ***#7*** DESTRUCTION OF AMERICA." This is the view of the other party about this current administration. TRUMP'S ACCOMPLISHMENTS VERSUS BIDEN'S ACCOMPLISHMENTS – Citizen Tom

1.2 [47]The Treasury secretary, Janet Yellen, declares, as an "expert" on these matters, that "debts and deficits do not matter". See, "Why Janet Yellen Doesn't Lose Sleep Over U.S. Borrowing That Alarms Most Americans", Why Janet Yellen Doesn't Lose Sleep Over U.S. Borrowing | Time.

of high fiscal deficit and public debt. But what we see the last years is exactly the opposite. The fiscal policy measures should be taken by influencing aggregate demand and supply, attempting to create better employment conditions and acceptable inflation level, leading the policy of steady trade balance, and supporting sustainable economic growth. Monetary Policy, which is the main subject, here, deals with the interest rate and the control of money supply by the central bank. It should be mostly focused on achieving stability of prices through targeting inflation rates, maximum employment, moderate L-T interest rate, financial market stability, growth of the GDP, and an exchange rate leading towards positive trade account balance. We want to test the comparative efficiency and effectiveness of the new public policies (monetary and fiscal policy), here.

To test the effectiveness of the monetary and fiscal policy simultaneously during the two regimes (Old from 1995 to 2008 and New from 2009 to present), a VAR model is constructed. We use a vector autoregression (VAR) model for the interrelated objective variables of the monetary and fiscal policy ($djia_t$, $rgdp_t$, i_{10YTB_t}, p_t, u_t, and ta_t)[48] as endogenous variables. Also, they are used as a function with their lagged values for all these endogenous variables in the system plus the monetary policy instruments ($i^{eff}_{FF_t}$, mb_t, and m_t) and the fiscal policy tools (t_t and g_t) as exogenous variables. The mathematical representation is as follows:

$$
\begin{aligned}
djia_t &= \alpha_{11} djia_{t-j} + \beta_{12} rgdp_{t-j} + \gamma_{13} i_{10YTB_{t-j}} + \delta_{14} p_{t-j} + \zeta_{15} u_{t-j} + \eta_{16} ta_{t-j} + c_o \\
&\quad + \theta_{11} i^{eff}_{FF_t} + \kappa_{12} mb_t + \lambda_{13} m_t + \mu_{14} t_t + \xi_{15} g_t + \varepsilon_{1t} \\
rgdp_t &= \alpha_{21} djia_{t-j} + \beta_{22} rgdp_{t-j} + \gamma_{23} i_{10YTB_{t-j}} + \delta_{24} p_{t-j} + \zeta_{25} u_{t-j} + \eta_{26} ta_{t-j} + c_o \\
&\quad + \theta_{21} i^{eff}_{FF_t} + \kappa_{22} mb_t + \lambda_{23} m_t + \mu_{24} t_t + \xi_{25} g_t + \varepsilon_{2t} \\
i_{10YTB_t} &= \alpha_{31} djia_{t-j} + \beta_{32} rgdp_{t-j} + \gamma_{33} i_{10YTB_{t-j}} + \delta_{34} p_{t-j} + \zeta_{35} u_{t-j} + \eta_{36} ta_{t-j} + c_o \\
&\quad + \theta_{31} i^{eff}_{FF_t} + \kappa_{32} mb_t + \lambda_{33} m_t + \mu_{34} t_t + \xi_{35} g_t + \varepsilon_{3t} \\
p_t &= \alpha_{41} djia_{t-j} + \beta_{42} rgdp_{t-j} + \gamma_{43} i_{10YTB_{t-j}} + \delta_{44} p_{t-j} + \zeta_{45} u_{t-j} + \eta_{46} ta_{t-j} + c_o \\
&\quad + \theta_{41} i^{eff}_{FF_t} + \kappa_{42} mb_t + \lambda_{43} m_t + \mu_{44} t_t + \xi_{45} g_t + \varepsilon_{4t}
\end{aligned}
\tag{7}
$$

See also, "U.S. National Debt by Year", U.S. National Debt by Year (investopedia.com). In addition, see, "US Debt by President: By Dollar and Percentage", US Debt by President: Dollar and Percentage (thebalancemoney.com). And as an atheist, she said: "Roe v. Wade and access to reproductive health care, including abortion, helped lead to increased labor force participation," Yellen said. See, "Abortion is an economic issue, argues Treasury Secretary Janet Yellen", Treasury Secretary Janet Yellen: Abortion improves women's outcomes (usatoday.com). See also, "Yellen: Banning abortion would be 'very damaging' to U.S. economy", Yellen: Banning abortion would be 'very damaging' to U.S. economy - POLITICO . With these people as public policy makers, we cannot expect any better results, than the current extremely questionable effectiveness and efficiency of their new policies.

[48]Which are: ln of DJIA, ln of RGDP, yield on 10YTB, ln of CPI, USU rate, and ln of TA.

$$u_t = \alpha_{51} djia_{t-j} + \beta_{52} rgdp_{t-j} + \gamma_{53} i_{10YTB_{t-j}} + \delta_{54} p_{t-j} + \zeta_{55} u_{t-j} + \eta_{56} ta_{t-j} + c_o$$
$$+ \theta_{51} i^{eff}_{FF_t} + \kappa_{52} mb_t + \lambda_{53} m_t + \mu_{54} t_t + \xi_{55} g_t + \varepsilon_{5t}$$

$$ta_t = \alpha_{61} djia_{t-j} + \beta_{62} rgdp_{t-j} + \gamma_{63} i_{10YTB_{t-j}} + \delta_{64} p_{t-j} + \zeta_{65} u_{t-j} + \eta_{66} ta_{t-j} + c_o$$
$$+ \theta_{61} i^{eff}_{FF_t} + \kappa_{62} mb_t + \lambda_{63} m_t + \mu_{64} t_t + \xi_{65} g_t + \varepsilon_{5t}$$

The evaluation and testing of the VAR model, eq. (7), are shown in Tables A4 and A6 in the Appendix. Also, measures of correlations and causality tests are applied between the instruments and the objective variables, Table A8.

Some Empirical Results

Table A1 shows the OLS estimations (eqs. 1-6) of the Old Regime (1995:01 – 2008:11). The i_{FF} had significant effect on u_t and ta_t. The mb_t had significant effects on $rgdp_t$, on p_t (inflation), u_t, and ta_t. The m_t^s had significant effects on p_t (inflation) and u_t. Table A2 continues with the OLS estimations during the New Regime (2008:12 – 2021:12). The i_{FF} has significant effects on $djia_t$ (bubble), on $rgdp_t$, on p_t (inflation), and on u_t. The mb_t has significant effects on $djia_t$ (bubble) and on u_t; and the m_t^s has significant effect on $rgdp_t$.

Then, we start testing the stationarity of the variables used in the VAR model. A stationary series is I(0). A difference stationary series is said to be integrated and is denoted as I(d), where d is the order of integration. The order of integration is the number of unit roots contained in the series or the number of differencing operations it takes to make the series stationary. If there is one or two unit root, the series is an I(1) or I(2). Standard inference procedures do not apply to regressions, which contain an integrated dependent variable or integrated regressors. Therefore, it is important to check whether a series is stationary or not before using it in a regression. Here, we use an Augmented Dickey-Fuller Test to test their stationarity, Table A3. The only I(0) series is the LUSDJIA. There are two series as I(2), LUSRGDP2012 and LUSGCTR. The other series are I(1).

Now, the empirical results of the VAR, eq. (7), for the Old Regime (1995:01-2008:11) are presented in Table A4. The i_{FF} had significant effect on u_t. The mb_t had significant effects on $djia_t$ (bubble), on $rgdp_t$. on p_t (inflation), and on u_t. The m_t^s had significant effect on u_t. The t_t had significant effects on $djia_t$ (bubble), on $rgdp_t$, and on u_t. The g_t had significant effects on $rgdp_t$, on i_{10YTB}, on p_t (inflation), and on u_t. Thus, the monetary and fiscal policy tools were not very effective on our ultimate objective variables because their coefficients are insignificant or with wrong signs (ineffective and inefficient). (1) The financial market (LUSDJIA) is affected significantly (at the 10% level) by the monetary base (LUSMB), but it has a wrong sign (-). It is affected significantly (at the 5% level) by the government taxes (LUSGCTR). (2) The real income (LUSRGDP2012) is affected by the monetary base

($LUSMB$), but it has wrong sign. It is also affected by the government taxes (at the 10% level), but it has wrong sign (+). It is also affected by the government spending (LUSGCEGI) significantly (at the 1% level). (3) The L-T interest rate (US10YTB) is not affected at all by the monetary policy instruments. It is affected significantly (at 5% level) by the government spending (crowding out effect). (4) The price level (LUSCPI) is affected significantly (at 1% level) by the monetary base, but it has wrong sign (-). It is affected significantly (at 1% level) by the government spending, which causes inflation. (5) The unemployment rate (USU) is affected significantly (at 5% level) by the federal funds rate, but it has wrong sign (-). It is affected significantly (at 5% level) by the monetary base, but it has wrong sign (+) and also by the money supply (LUSM2) significantly (at 1% level), but it has wrong sign (+), too. It is affected significantly (at 5% level) by taxes, but it has wrong sign (-). Lastly, it is affected significantly (at 10% level) by government spending (g); an increase in (g) reduces unemployment (u). (6) The international trade (current account, LUSCA) is not affected at all by monetary or fiscal policy. It needs a trade policy tool (dollar devaluation, tariffs, import taxes, quota, export subsidies, etc.).[49]

Engle and Granger (1987) pointed out that a linear combination of two or more non-stationary series may be stationary. If such a stationary linear combination exists, the non-stationary-series are said to be cointegrated. The stationary linear combination is called the cointegrating equation and may be interpreted as a long-run equilibrium relationship among the variables. The cointegration test output for the six-variable VAR system is shown in Table A5. The result show that the Trace test indicates 3 cointegrating equations at the 1% level and the Max-Eigenvalue test indicates 3 cointegrating equations at the 1% level and 1 cointegrating equation at the 5% level.

In addition, the New regime (2008:12 to 2022:06) is tested the same way, with a VAR, as the previous one and the results appeared in Table A6. The i_{FF} has significant effects on $rgdp_t$, on p_t (inflation), and on u_t. The mb_t has significant effect on $djia_t$ (bubble). The m_t^s has a significant effect on u_t. The t_t has significant effects on $rgdp_t$, on p_t (inflation), and on u_t. The g_t has significant effects on $rgdp_t$, on p_t (inflation), on u_t, and on ta_t. Thus, the new public policy tools have a small effect on the ultimate objective variables. (1) The financial market (LUSDJIA) is affected significantly by the monetary base (LUSMB) (at the 10% level). (2) The U.S. income (LUSGDP) is significantly affected (at 1% level) by the federal funds rate (USFFR), but it has a wrong sign (+). An increase in federal funds rate is increasing production. Also, it is affected significant (at 1% level) by taxes (LUSGCTR) but it has wrong sign (+) and by government spending (at 1% level). (3) The L-T interest rate (US10YTB) is not affected by any monetary or fiscal policy tool. (4) The price level (LUSCPI) is significantly affected by the federal funds (USFFR), by taxes (LUSGCTR), and by government spending (LUSGCEGI) (at 1% level). All these policy tools are causing inflation[50]. (5) The unemployment (USU) is affected by

[49]The U.S. trade policy is an anti-American one. Actually, all the U.S. foreign policies are anti-American. See, Mearsheimer and Walt (2007).

[50]Fedflation (demand-side or demand-pull inflation) and Bidenflation (supply-side or cost-push inflation). Richmond Fed President Thomas Barkin said he expects high rates to slow the

federal funds (USFFR), but it has wrong sign (at 1% level); also, by money supply (LUSM2) with wrong sign (at 1% level), by taxes (at 1% level) but wrong sign again, and by government spending (at 10% level). (6) The current account (LUSCA) is significantly affected by the government spending (at 1% level).

Table A7 shows the cointegration of the non-stationary series of the VAR system, Table A6. The Trace test indicates 3 cointegrating equations at 1% level and the Max-Eigenvalue test indicates 2 cointegrating equations at the 1% level and 1 cointegrating equation at the 5% level. Lastly, a correlation and causality test between the policy instruments and the objective variables are shown in Table A8.

Before 2008, the data show that the federal funds (i_{FF}) had no significant effect on any macro-variables, but there is causality with *u*, *rgdp*, and *ta*. The monetary base (mb) had significant effect (high correlation) on output ($rgdp$), negative on interest rate (i_{10YTB}), on inflation [$\rho = +0.965$ and causality, $mb => p\ (18.950^{***})$], it causes *u* and i_{10YTB} (liquidity effect); also, negative effect on trade (ta), and increase on government spending (g) and taxes (t). The money supply (m^s) had similar effect, but no drastic effect on the financial market ($djia$). It causes *p* (inflation), *u*, *rgdp*, and i_{10YTB}. Government spending (g) had a high significant effect on inflation [$\rho = +0.997$ and $g => p\ (9.476^{***})$]; it causes *u*, *rgdp*, and i_{10YTB}. Only taxes (t) were affecting the market ($djia$) [$\rho = +0.877$ but not causality]. Taxes (t) cause *p* (inflation) and *u* (unemployment). Also, government spending (*g*) causes *mb* and m^s.

With the new monetary policy, after 2008, the i_{FF}^{eff} causes *p* (inflation), *u* (unemployment), *rgdp*, and *ta*. The monetary base (mb) has a significant effect on the stock market ($djia$) [$\rho = +0.938$ but mo causality]. The mb has affected prices (p) [$\rho = +0.963$ and no causality]; the *mb* causes *u* and *rgdp*. The money supply (m^s) has affected the market ($djia$) [$\rho = +0.902$ and $m^s => djia\ (3.030^{*})$] and the price level (p) [$\rho = +0.975$ and no causality]; m^s causes *u*, *rgdp*, *djia*, and *ta*. The fiscal policy, government spending (g) has a high correlation with the market ($djia$) [$\rho = +0.867$ and $g => djia\ (2.974^{*})$] and with inflation (p) [$\rho = +0.908$ no causality]; *g* causes *u* and *djia*. Taxes (*t*) have a high correlation with the market ($djia$) [$\rho = +0.897$ and no causality]. Taxes (t) have a high correlation with prices (p) [$\rho = +0.919$ and no causality], but cause *u* and *djia*. Also, *g* causes i_{FF}^{eff}, so the monetary policy is accommodating the financing of budget deficit of the government.

Some Policies and Politics Implications

The financial crisis started in August 2007, when French banks stopped buying U.S. mortgage-back securities because they considered them risky and with high

economy further and cool inflation down to the 2% target. See, **Bloomberg** <noreply@mail.bloombergbusiness.com>.

market prices, due to low federal funds rate.[51] More than a year later (December 16, 2008), the Fed reacted with new monetary policy to deal with this financial crisis and with the introduction of new instruments that enacted to deal with its consequences and led to great changes in the federal funds market. In general, four developments caused most of the change: (α′) the Fed's balance sheet expanded in size,[52] (β′) new banking regulations were enacted,[53] (γ′) the Fed began paying interest to banks on funds they held in their reserve accounts at the Fed (IOR), interest on required and excess reserves, IOR&ER, Figure 1,[54] (δ′) it started using new monetary policy instruments (tools),[55] (ε′) zero reserve requirements, R_R (actually, reserve requirements ratio, $r_R = 0$),[56] (στ′) the use of overnight reverse repurchase agreement facility, ON RRP,[57] and (ζ′) the scorned and idle margin requirements tool (r_m).[58] Using these dramatized and complex tools (instruments), the Federal Reserve influences the demand for, and supply of balances that depository institutions hold at Federal Reserve Banks, which affect excessively the monetary base (MB) and the money supply (M^s).

[51]It was below 3.00% from 2001 to 2005 and 1.00% from 2003 to 2005. See, http://www.fedprimera te.com/fedfundsrate/federal_funds_rate_history.htm

[52]See, Wolla (2019).

[53]See, Kallianiotis (2020b).

[54]See, "Interest on Required Reserve Balances and Excess Balances", https://www.federalreserve.gov/monetarypolicy/reqresbalances.htm

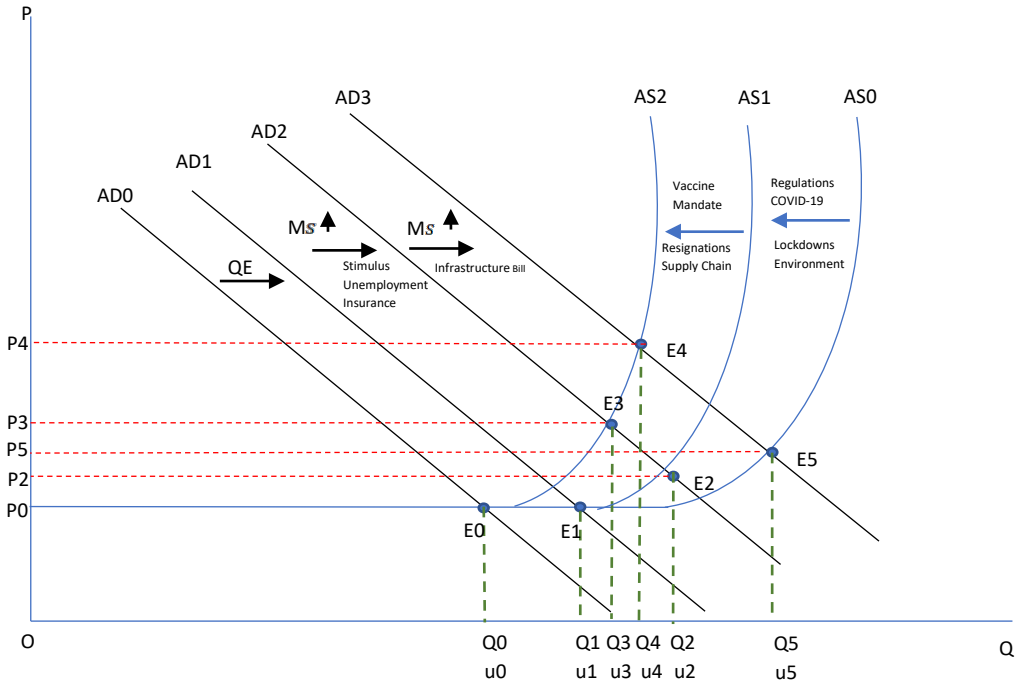
[55]See, Kallianiotis (2017).

1.2.1 [56]*Since March 26, 2020, they are zero. See, Reserve Requirements Federal Reserve Board - Reserve Requirements*

[57]See, Overnight Reverse Repurchase Agreement Facility, https://www.federalreserve.gov/monetary policy/overnight-reverse-repurchase-agreements.htm

[58]The $r_m = 50\%$ since 1974. See, https://www.frbsf.org/economic-research/publications/economic-letter/2000/march/margin-requirements-as-a-policy-tool/

Figure 3. *U.S. Current Aggregate Demand and Supply*



Note: The quantitative easing (QE) moved the AD_0 to AD_1 from point E_0 to E_1. The continue increases in money supply and the COVID-19 stimulus increase the AD to AD_2 ; Biden's regulations and businesses' lockdowns shifted the AS_0 to AS_1 and the equilibrium output (Q_2) and employment (u_2) to point E_2. Then, the new money supply and the "infrastructure" bill moved the AD to AD_3 and the vaccine mandates, resignations, layoffs, supply chain problems, "protection of the environment" by going against fossil fuels, etc., reduce the AS to AS_2 and the equilibrium to E_4 (Bidenflation), which cause reduction in output (Q_4) and high unemployment (u_4) and at the same time an enormous inflation in P_4 (stagflation). If the AS had been at AS_0 and the AD at AD_3, the output would have been to E_5 (Fedflation), with the economy almost at full employment and moderate inflation at P_5. Then, moderation is the only solution, but our policy makers do not follow these historic traditions, values and virtues.

Thus, the latest incompatible modern monetary and fiscal policies have caused serious problems to the U.S. economy. The U.S. national debt had surpassed 122% of GDP[59] and deficits had tended to be up to 11% during the latest financial crisis. On October 13, 2023, it was 124.09% of the GDP[60] and it is going up constantly. The

[59]The U.S. national debt (8/24/2016) was $19.450 trillion and the GDP $16.575 trillion. With November 21, 2023, the $ND = \$33.744$ trillion (124.46% of the GDP), the budget deficit was $1.742 trillion, and the $GDP = \$27.115$ trillion. On July 19, 2024, it had reached $ND = \$34.946$ trillion. See, https://www. usdebtclock.org/. They have to finance the wars in Ukraine and in Israel; these are the orders that they receive. (*Sic*).

[60]In Euro-zone, the national debts were from 9.7% (Estonia) to 176.9% (Greece) of the GDP, with an average of 85.2% for the fiscal year 2015. The budget deficits, for the same year, were from -1.2% (surplus, Luxembourg) to 7.2% (Greece) of the GDP. This was partly due to industry (banks)

chronic deficits come from incomparable American characteristics (its market-oriented economy), which in large part has been caused by policies of tax reductions, especially for the upper income groups and businesses since 1980s[61] and inconsiderable spending by the current government. Taxes are going up for everyone with the new fiscal cliff deal on January 1, 2013 and with Biden's administration since 2021.[62] Also, U.S. has an increase in spending for Medicare (prescription drugs) and for all these wars that are going on (in Iraq, Afghanistan, Syria, Levant, Libya, Ukraine, Israel, etc.).[63]

America's problems, in the past, were relatively limited, due to good economic growth because of demographic expansion (massive immigration and relatively high fertility rates), due to its value system (the European values or more accurate, the Greek-Orthodox values), its manufacturing and agriculture, and because of the dollar's preeminent role as the international reserve currency since 1944.[64] The new liberal pseudo-philosophies have destroyed the entire West, its culture, its values, its free speech, its freedom of expression, its education,[65] its freedoms in general, its existence. The open borders policies with the millions of illegal (mostly, Asians, Africans, and Muslims) immigrants have changed the European identity and have changed the name of the old Christendom to Eurostan; but the worst are the daily terrorist attacks and other crimes against the poor citizens.[66] The same crises exist in U.S., too, since 2021; reverse discrimination is the rule, today. The Fed is co-responsible (jointly liable) by providing the dollars (Fed's liabilities) that are used by the Treasury to pay for the nation's deficits by buying the government debt instruments (U.S. Treasury liabilities) and mortgage back securities (private debt liabilities).

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rescue plans (different bailouts), stimulus plans, and economic stabilizers (i.e., unemployment benefits, etc.). See, World Debt Clocks (usdebtclock.org)

2. [61]In U.S. businesses and wealthy people do not pay taxes. See, "19 of America's biggest companies paid little — or zero — income tax: 'The tax code is broken' ", 19 of America's biggest companies paid little — or zero — income tax: "The tax code is broken" - CBS News . Also, "55 Corporations Paid $0 in Federal Taxes on 2020 Profits", 55 Corporations Paid $0 in Federal Taxes on 2020 Profits – ITEP . Further, "30 Biggest Companies That Paid Zero Taxes", 30 Biggest Companies That Paid Zero Taxes - TheStreet . The textbooks call it "double taxation". (*Sic*).

3. The textbooks call it "double taxation". (*Sic*).

4. [62]See, "Biden's FY 2023 Budget Would Result in $4 Trillion of Gross Revenue Increases", Biden Budget & Biden Tax Increases: Details & Analysis (taxfoundation.org)

[63]The strange of all these wars is that only Christians have been affected. Unfortunately, there are moral perpetrators behind these jihadists and NATOists. The country that has not submitted to these mobs is the Orthodox Christian Russia. See, Mearsheimer and Walt (2007). The lack of leadership in the West is causing all these problems.

5. [64]See, Kallianiotis (2014a and b). Lately, the dollar is facing a competition from the BRICS nations, due to the conflicts between West and East. See, "Great Power Conflict Fuels BRICS Expansion Push: Amid China-U.S. tensions, the impetus to build a bigger BRICS has grown stronger than ever" Great Power Conflict Fuels BRICS Expansion Push – The Diplomat

[65]Colleges and Universities have abandoned excellence for DEI. (*Fox News*, 12/11/2023). The educational system in the West, if it is not yet dead, it is dying daily.

[66]On July 27, 2016, they aattacked a Church and killed the priest during the service in France. See, http://www.nytimes.com/2016/07/29/world/europe/france-church-attack.html?_r=0. Greece is in big trouble with all these millions of illegal immigrants (Muslims) that EU has forced her to keep inside the country.

These two new public policies contributed to the bubble of the stock market, Figure 2, to the high inflation, Figure 3 and Graph 9, and to enormous debts and deficits, Figure 4 and Graphs 4, 5, and 6. We live in a fragile world, which is based on recycling of liabilities[67] and redistributing wealth and risk. Of course, the mal and manipulated investment in financial assets, the asset bubbles, the overleverage, the corruption, and the income inequality[68] are going to deteriorate further the social coherence of our heterogeneous nations (mixtures of people and cultures) by creating poverty and satisfy Illuminati's objective, the reduction of population. Public policy makers have a lot of work to do in the near future; but will they have the power to pursue a humane social policy? So far, we see only their ineffective politics and their anti-social policies.

Taxes and government spending are tools of fiscal policy. These two instruments have to be used with a fair, effective, and optimal way that means ethically, morally,[69] and with moderation. Unfortunately, there is an unfair and unethical tax, the property tax, which is imposed on individuals' home. This home does not generate any income, it has only expenses and the family has to pay "rent" (property taxes) for its own home. Thus, both extreme systems are against private property; the poor individual has no property because he cannot afford to pay property taxes. Property taxes have to be abolished for homes that they house the family of the owner.[70] Only fair progressive income taxes are sufficient for a prosperous nation. At the same time, the government spending must be prudent, efficient, moderate, and without wastes.[71] The current administration's waste and the financing of Zelensky[72] to go against the "big

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[67]From *capitalism*, we have, now, a new system, *debtism* and going to *globalism* (global dictatorship), which actually is already, here. See, Davidson (2015).

[68]We are in a new gilded age, worse than the one in 1870s. See, O'Donnell (2015).

[69]The moral crisis is a very serious impediment to the western (U.S. and EU) culture, today. The last three years, immorality and pervasion have surpassed any previous depravity in human history. There is no way out from these enemies of humanity. See, Όρα, Ἀλεξάντερ Ντούγκιν, «Εἴμαστε ἀντιμέτωποι μέ τή Δύση ὡς ἰδεολογία, φιλελευθερισμός, παγκοσμιοποίηση, μετανθρωπισμός». https://orthodoxosty pos.gr/e%ce%af%ce%bc%ce%b1%cf%83%cf%84%ce%b5-%ce%b1%ce%bd%cf%84%ce%b9%ce %bc%ce%ad%cf%84%cf%89%cf%80%ce%bf%ce%b9-%ce%bc%ce%b5-%cf%84%ce%b7-%ce% b4%cf%8d%cf%83%ce%b7-%cf%89%cf%82-%ce%b9%ce%b4%ce%b5%ce%bf%ce%bb/. See, also, " 'Mother' and 'Father' Replaced With 'Parent 1' and 'Parent 2' in French Schools Under Same-Sex Amendment", 'Mother' and 'Father' Replaced With 'Parent 1' and 'Parent 2' in French Schools Under Same-Sex Amendment (newsweek.com)

[70]This unfair, unethical, anti-social, anti-humane, and occupational tax, the property tax, has been imposed on Greeks since the European debt crisis (2008) by the globalist mob of the EU and IMF.

[71]Independent studies have shown that a pencil for the federal government costs $300; its true cost is $0.10. Then, imagine how much cost the 924 aircrafts that are used by the government and how much is their pollution to the environment, which they pretend that they care. (*Fox News*, 7/19/2022).

6. [72]See, "Zelenskiy Tells Finance Ministers Ukraine Needs $55 Billion For Budget, Rebuilding Through Next Year". https://www.rferl.org/a/zelensiky-appeals-international-donors-support-ukrain e/32080182.html . So far, he has received $120 billion; Biden is sending $2 billion more, and Zelensky visited Washington D.C. and asked for $24 billion. (Fox News, 9/20/2023). See also, Where the $113 billion the US approved for Ukraine has gone | CNN Politics . But, a homogenous country, like Ukraine, cannot have a non-Ukrainian as President because he causes serious divisions and enormous problems (even wars) to the citizens. See, Ἡροδότου *«Τό Ἑλληνικόν ἐόν ὁμαιμόν τε καί ὁμόγλωσσον καί θεῶν ἱδρύματα κοινά καί θυσίαι ἠθεά τε ὁμότροπα»* (Ἡρόδοτος, Οὐρανία

enemies", the Russians, and lately, Israel to go against Palestinians, can be seen from the increase of the national debt the last three years by $13.117 trillion or 60.73% or 20.24% per annum,[73] Figure 4.

In enacting fiscal policy, which encompasses the budgeting process of a sovereign government as well as the justifications for budget decisions, politicians make historical compromises with, and commitments to, their ethical ideals in the form of real initiatives and operations of government because there is an enormous conflict of interest, an existing establishment, a strong lobby,[74] corrupted and controlled politicians, manipulated media,[75] and a deep swamp (παρακράτος). Unlike proclamations of ethical probity and the censures of their competitors that politicians may utter during their campaigns and during their speeches, but in office they cannot satisfy their promises, so people do not trust them anymore.[76] Due to oppositions from the different branches (legislative,[77] executive, and judicial) and their different political parties (Republicans and Democrats) of government, different ideologies and degree of corruption, the budgetary and fiscal decisions made by lawmakers even

144). See also, How Much Aid Has the U.S. Sent Ukraine? Here Are Six Charts. | Council on Foreign Relations (cfr.org). In addition, Biden signs $95 billion military aid package for Ukraine, Israel and Taiwan, Biden signs $95 billion military aid package for Ukraine, Israel and Taiwan, Biden signs $95 billion military aid package for Ukraine, Israel and Taiwan : NPR

[73]The U.S. national debt went from $21.6 to $34.946 trillion, the last three years. Figure 4. See, also, https://tradingeconomics.com/united-states/government-debt
and Federal Deficit and Debt: January 2021 (pgpf.org)

[74]See, Mearsheimer and Walt (2007). See also, Kallianiotis (2023).

[75]See, John Swinton, the former Chief of Staff at the NEW YORK TIMES, who was asked to give a toast before the prestigious New York Press Club in 1953. He made this candid confession [it's worth noting that Swinton was called "The Dean of His Profession" by other newsmen, who admired him greatly]. "There is no such thing, at this date of the world's history, as an independent press. You know it and I know it. There is not one of you who dares to write your honest opinions, and if you did, you know beforehand that it would never appear in print. I am paid weekly for keeping my honest opinions out of the paper I am connected with. Others of you are paid similar salaries for similar things, and any of you who would be so foolish as to write honest opinions would be out on the streets looking for another job. If I allowed my honest opinions to appear in one issue of my paper, before twenty-four hours my occupation would be gone. The business of the journalist is to destroy the truth; to lie outright; to pervert; to vilify; to fawn at the feet of mammon, and to sell the country for his daily bread. You know it and I know it and what folly is this toasting an independent press. We are the tools and vassals of the rich men [the dark powers] behind the scenes. We are the jumping jacks, they pull the strings and we dance. Our talents, our possibilities and our lives are all the property of other men. We are intellectual prostitutes."

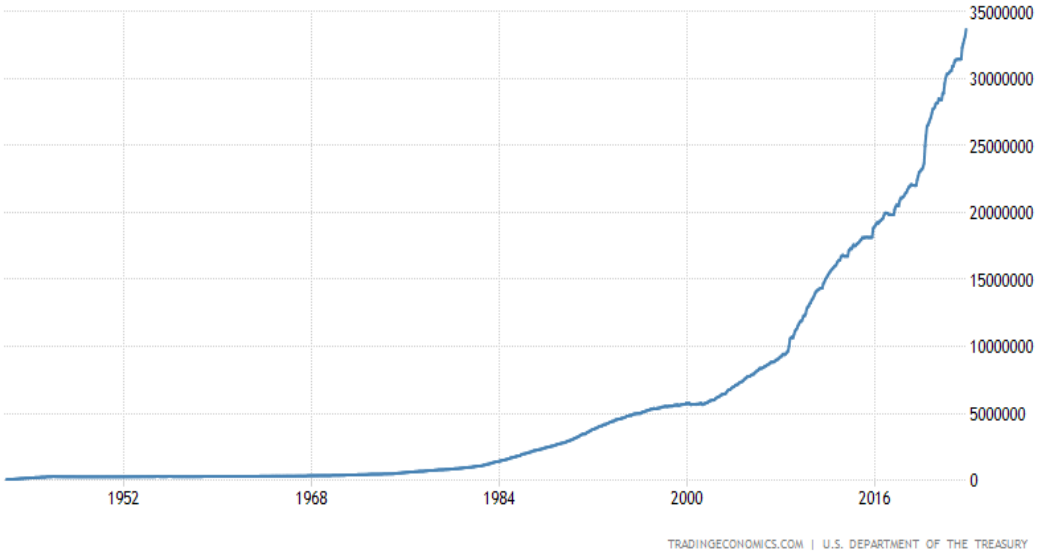
[76]See, "Turnout in U.S. has soared in recent elections but by some measures still trails that of many other countries". The turnout is 94.9% in Uruguay (the highest), 62.8% in the last U.S. elections, in the past the turnout was small (i.e., in 1996, it was only 49%), the same also holds with EU elections, and 36.1% in Switzerland. https://www.pewresearch.org/fact-tank/2022/11/ 01/turnout-in-u-s-has-so ared-in-recent-elections-but-by-some-measures-still-trails-that-of-ma ny-other-countries/

[77]The legislative branch, the Congress is composed of two parts:

(1) Senate: There are two elected Senators per state, totaling 100 Senators. A Senate term is six years and there is no limit to the number of terms an individual can serve.
(2) House of Representatives—There are 435 elected Representatives, which are divided among the 50 states in proportion to their total population. There are additional non-voting delegates, who represent the District of Columbia and the territories. A Representative serves a two-year term, and there is no limit to the number of terms an individual can serve.

though that they are key components of their effective morality,[78] but a morality that has, by design, enormous and differential impact on others (citizens and businesses) cannot be materialized.

Figure 5. *United States Government Debt*



Note: The U.S. National Debt was with July 19, 2024. $ND = \$34.946$ trillion.
Source: https://tradingeconomics.com/united-states/government-debt and Federal Deficit and Debt: January 2021 (pgpf.org).
Also, https://www.usdebtclock.org/

Unfortunately, it depends on the will of the opposition party and especially, if this party has the majority of the senate, nothing can pass because they want to show to the voters that this administration has failed and they must vote for the other party that is more effective.[79] During the last sixteen years (2008-2024) the monetary policy is ineffective, inefficient, and has caused serious social problems (enormous social costs); then, the last three year (2021-2024), we see that the federal system and the entire liberal administration are not effective, too. Before 2021, governors and mayors, in different states and cities, did not follow administration's orders or directions. Judges also were cancelling or banned executive orders. There was and still is a big division that is cultivated by the fanatic left (atheists and backward "progressives", the deep state) and has made questionable their public politics; their protection towards

[78]See, "Pete Buttigieg Flew His Husband to a Dutch Sporting Event in a Military Aircraft on Taxpayer Money". https://republicanballotnews.com/pete-buttigieg-flew-his-husband-to-a-dutch-sporting-eve nt-in-a-military-aircraft-on-taxpayer-money/

[79]I remember very well my professor of Microeconomics in my Graduate School, where he was saying that "the politicians have only one objective, to be reelected and nothing else". Now, after forty years, I see that he was absolutely right. They have no other objective; their corruption must be over 99%. They revealed their incompetence, lately, with the war against Russia and Palestine. They do not care for peace and the life of the people. The order that they are receiving is that we are overpopulated and the population must be reduced substantially. What a misfortune for our societies, today!

the opposition leaders,[80] the respect of the Constitution, the western Christian culture, and the entire value system. (*Sic*).

Some Concluding Remarks

In response to the global financial crisis, as it was mentioned above, several new policies were enacted that altered the structure of the federal funds market in profound ways by keeping the target federal funds rate close to zero. On the borrowing side, the Fed's large-scale asset purchases (LSAPs) flooded the banking system with liquidity and made it less necessary to borrow or to seek more deposits, which has raised serious ethical policy questions. Banks had a deposit rate closed to zero ($i_D = 0.05\%$) for more than fourteen years. In addition, the Federal Deposit Insurance Corporation (FDIC) introduced new capital requirements[81] that increased the cost of wholesale funding for domestic financial institutions. On the lending side, the Federal Reserve is paying financial institutions interest on their reserves (*IOR*), which exceeds the effective federal funds rate.[82] When financial institutions have access to this low-risk and high liquidity alternative (i_{IOR}), they have less incentive to lend in the federal funds market (i_{FF}^{eff}), to borrow from the discount window (i_{DR}), and to pay high interest on deposits (i_D), because, $i_{DR} > i_{IOR} > i_{FF}^{eff} > i_D$.

In 2020, Federal Reserve officials signaled plans to keep interest rates near zero for years to come and said they were studying how to provide more support to a U.S. economy battered by the suspicious coronavirus (COVID-19), the mandatory vaccines,[83] and related shutdowns. "We are strongly committed to using our tools to do whatever we can and for as long as it takes to provide some relief and stability," Fed Chairman Jerome Powell said on June 10, 2020 at a virtual news conference after

7. [80]On July 13, 2024, it was even an assassination attempt against President Trump and the secret services did nothing to protect him. Then, for what public policies can we talk? The swamp has destroyed the entire country and the entire western world. The world's hope is only the Christian Orthodox countries, Russia (with its leader, Vladimir Putin), and a few other eastern European nations that are still outside of the EU and NATO trap. Unfortunately, Greece is gone forever with these pseudo-leaders in power for 45 years. See, "'They're incompetent': Sen Marshall blasts 'worthless' Secret Service briefing on Trump assassination attempt", 'They're incompetent': Sen Marshall blasts 'worthless' Secret Service briefing on Trump assassination attempt (msn.com)

[81]On April 16, 2019, the FDIC, the Office of the Comptroller of the Currency, and the Board of Governors of the Federal Reserve System issued a proposal that would establish risk-based categories for determining applicability thresholds for regulatory capital requirements for certain U.S. subsidiaries of foreign banking organizations and application of liquidity requirements to foreign banking organizations, certain U.S. depository institution holding companies, and certain depository institution subsidiaries. Comments on the proposal must be received by June 21, 2019. See, "Regulatory Capital", https://www.fdic.gov/resources/bankers/capital-markets/regulatory-capital/index.html

8. [82]See, George Selgin, "The Strange Official Economics of Interest on Excess Reserves", October 3, 2017. https://www.alt-m.org/2017/10/03/strange-official-economics-of-interest-on-excess-reserves/ . See also, "Is the Federal Reserve a Scam?", Is the Federal Reserve a Scam? : r/conspiracy (reddit.com)

9. [83]See, «Συνέντευξη τύπου από την ευρωβουλή για τα εμβόλια κατά του κορωνοϊού», https://enro miosini.gr/arthrografia/synenteyxi-typoy-apo-tin/

a two-day policy meeting.[84] Earlier, in 2021, they had said that they will keep up with the liquidity to protect the environment.[85] But, they caused instability (Figure 2) and high inflation (Figure 3). Thus, the unethical bail in and bail out, plus the other "protective" social costs, are continuing for many years; only the Illuminati know the exact time, due to this latest healthcare, financial, economic, environmental, social, and the worst of all, the election crisis of the 2020 and their new plans for the 2024 one.[86] The data and the empirical work show that all these results give a questionable effectiveness, efficiency, and social welfare of the new public policies, and have negative effects on the small businesses, on the citizens of the country, and on the ultimate objective economic variables.

Lastly, the questions are still remaining. Why the Fed needs these overnight deposits (*ON RRP*)?[87] Why the tax payers have to pay some more billion dollars per annum to these money market nonbank lenders? Why they do not raise the deposit rate (i_D) to increase the deposits (demand for deposit accounts)[88] in our banks, if they need more liquidity? Make the saving account rate $i_D \geq i_{ONRRP} \cong 5.32\%$ and not zero ($i_D = 0.05\%$), as it was for 15 years. These new public policies are not necessary and they have also a very high social cost (trillions of dollars bail out cost to tax payers and bail in cost to depositors, plus the capital losses to investors in the financial market and the reduction of purchasing power of the consumers from the double digit inflation).[89] The federal funds market can provide the liquidity for the banks through the *OMO* without forcing the people to bail out banks by paying *IOR* and *IONRRP*. The limited reserve system is sufficient, fair, ethical, and effective to provide all reserves needed in our banking system. Of course, citizens of the country want safety, security, peace, economic stability, and improvement of their social welfare. The current public policies are not able to provide these basic needs, so there is a necessity for new public policies and efficient and effective policy makers and a new Democratic system, different that the current corrupted one, to satisfy these simple humane objectives.

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[84]See, Fed Officials Project No Rate Increases Through 2022. https://www.wsj.com/articles/ fed-de bates-how-to-set-policy-for-the-post-pandemic-economy-11591781402

9.1.1 [85]*See, "Climate Change and Financial Stability",* *The Fed - Climate Change and Financial Stability (federalreserve.gov)*

[86]**"I made history.** When I **LEFT** the Democratic Party. And after I stood up against the "tolerant" Left's REGIME, **they came after me. HARD.** This is Tulsi Gabbard. When I came to Congress for the first time in 2002, I saw with my own eyes what the Democratic party was…an **anti-American**, **woke**, and **cowardly** group of **ELITISTS** who fought for **NOBODY** but themselves! On their priority list, **Americans like you and I were at the very bottom.** As a combat veteran and former Congresswoman, it's in my *blood* to serve my country. So I stood up for the American **PEOPLE!** And the Democrats branded me a **TRAITOR.** They threw the entire kitchen sink at me, hoping I'd back down and leave the **SWAMP** in shame. But I will **NEVER** give up the fight to **SAVE** our country! (Tulsi Gabbard).

[87]See, "How the Fed's Overnight Reverse Repo Facility Works", JANUARY 11, 2022. HTTPS://LI BERTYSTREETECONOMICS.NEWYORKFED.ORG/2022/01/HOW-THE-FEDS-OVERNIGHT -REVERSE-REPO-FACILITY-WORKS/

[88]See, Hadjimichalakis (1982).

[89]See, Kallianiotis (2022).

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Appendix

Table A1. *OLS Estimations of the Objective Variables (1995:01-2008:11)*

Variables	$djia_t$	$rgdp_t$	i_{10YTB_t}	p_t	u_t	ta_t
c_0	-3.346	0.631*	10.927	-0.424*	38.657***	1.751*
	(2.830)	(0.334)	(14.644)	(0.223)	(8.495)	(0.951)
$djia_{t-1}$	0.800***	0.012**	0.445*	-0.007*	-0.073	0.025
	(0.051)	(0.006)	(0.265)	(0.004)	(0.151)	(0.020)
$rgdp_{t-1}$	0.938*	0.897***	-1.375	0.087**	-7.591***	-0.378**
	(0.533)	(0.062)	(2.684)	(0.042)	(1.642)	(0.184)
$i_{10YTB_{t-1}}$	-0.009	-0.001	0.778***	0.002*	0.018	-0.002
	(0.008)	(0.001)	(0.070)	(0.001)	(0.022)	(0.003)
p_{t-1}	-0.765*	-0.027	1.760	0.845***	3.608***	0.240
	(0.421)	(0.055)	(2.904)	(0.031)	(1.199)	(0.156)
u_{t-1}	-0.030*	0.002	0.100	0.001	0.664***	0.004
	(0.018)	(0.002)	(0.096)	(0.001)	(0.045)	(0.006)
ta_{t-1}	0.140	-0.024*	-0.739	0.028***	-0.444	0.913***
	(0.118)	(0.014)	(0.778)	(0.008)	(0.361)	(0.049)
$i^{eff}_{FF_t}$	-0.002	0.001	0.056	0.001	-0.075***	0.004**
	(0.006)	(0.001)	(0.041)	(0.001)	(0.017)	(0.002)
mb_t	-0.120	-0.016*	-0.153	-0.038***	0.416**	0.041**
	(0.078)	(0.008)	(0.501)	(0.013)	(0.176)	(0.020)
m_t	0.147	0.054	-1.153	0.083***	1.684**	0.005
	(0.272)	(0.034)	(1.678)	(0.022)	(0.686)	(0.084)
$AR(1)$	-	-0.289*	0.302***	-	-	-
		(0.159)	(0.106)			
$MA(1)$	-	-	-	0.527***	-0.238***	-0.434***
				(0.068)	(0.090)	(0.102)
R^2	0.980	0.999	0.957	0.999	0.965	0.981
SER	0.042	0.005	0.209	0.002	0.126	0.017
F	858.325	11091.97	317.292	27128.50	383.623	741.521
$D-W$	2.035	2.192	1.929	1.881	2.034	1.842
N	167	167	167	167	167	167
$RMSE$	0.040279	0.004394	0.200154	0.002370	0.121709	0.016216

Note: $djia_t$ =USDJIA = U.S. Dow Jones Industrial Average Index, $rgdp_t$ = USRGDP2012 = U.S. real GDP, i_{10YTB_t} = US10YTB = U.S 10-Year Treasury Bonds Rate, p_t = LUSCPI = ln of U.S. CPI, u_t = USU = U.S. unemployment rate, ta_t = LUSCA = ln of U.S. Current Account, c_0 = constant term, $i^{eff}_{FF_t}$ = USFFR = U.S. effective federal funds rate, mb_t =LUSMB = ln of U.S. monetary base, m_t =LUSM2= ln of U.S. money supply (M2), $AR(1)$ =autoregressive 1 process, $MA(1)$ = moving average 1 process, *** = significant at the 1% level, ** = significant at the 5% level, * = significant at the 10% level, R^2 = R-squared, SER=S.E. regression, F = F-statistic, $D-W$= Durbin-Watson statistic, N = number of observations, and $RMSE$ = root mean square error..

Source: Economagic.com , Bloomberg, and FRED.

Table A2. *OLS Estimations of the Objective Variables (2008:12-2024:03)*

Variables	$djia_t$	$rgdp_t$	i_{10YTB_t}	p_t	u_t	ta_t
c_0	0.148	3.532***	-31.261**	0.125	-79.999*	3.639
	(2.488)	(0.565)	(14.752)	(0.227)	(44.652)	(1.017)
$djia_{t-1}$	0.854***	0.010	0.652**	0.005	-1.766***	0.014
	(0.038)	(0.009)	(0.305)	(0.004)	(0.674)	(0.015)
$rgdp_{t-1}$	0.166	0.513***	3.287**	-0.021	9.098	-0.397***
	(0.315)	(0.071)	(1.364)	(0.025)	(5.647)	(0.129)
$i_{10YTB_{t-1}}$	0.004	0.001	0.174**	0.001	-0.125	-0.007**
	(0.007)	(0.002)	(0.073)	(0.001)	(0.127)	(0.003)
p_{t-1}	-0.662**	0.029	4.923	0.995***	4.584	0.050
	(0.261)	(0.059)	(3.558)	(0.028)	(4.678)	(0.107)
u_{t-1}	0.005	-0.002**	0.052	0.001	0.891***	-0.007***
	(0.003)	(0.001)	(0.037)	(0.001)	(0.062)	(0.001)
ta_{t-1}	0.280*	0.024	0.479	-0.007	1.102	0.546***
	(0.150)	(0.034)	(0.821)	(0.009)	(2.689)	(0.061)
$i_{FF_t}^{eff}$	0.010	0.011***	0.137	0.001	-0.325*	0.017***
	(0.011)	(0.002)	(0.087)	(0.001)	(0.191)	(0.004)
mb_t	0.041	0.012	-0.363	-0.002	-0.793	0.050***
	(0.036)	(0.008)	(0.498)	(0.004)	(0.642)	(0.015)
m_t	0.315***	0.094***	-3.140**	0.008	-0.956	-0.067
	(0.104)	(0.024)	(1.532)	(0.010)	(1.874)	(0.043)
$AR(1)$	-	-	0.914***	0.327***	-	-
			(0.044)	(0.080)		
R^2	0.990	0.992	0.948	0.999	0.892	0.807
SER	0.044	0.010	0.206	0.003	0.793	0.018
F	1967.409	2477.174	283.364	20260.32	158.911	80.974
$D-W$	2.109	1.710	1.891	1.910	1.886	2.149
N	184	184	184	184	184	184
$RMSE$	0.042978	0.009761	0.207465	0.002762	0.771442	0.017568

Note: See Table A1.
Source: See, Table A1.

Table A3. *Augmented Dickey-Fuller Test*

Variables in levels (Yt)	ADF	I(d)	Variables in 1st difference [Δ(Yt)]	ADF	I(d)
LUSDJIA	-3.278**	I(0)	Δ(LUSDJIA)	-12.495***	I(1)
LUSRGDP2012	-1.919	I(2)	Δ(LUSRGDP2012)	-1.336	I(2)
US10YTB	-2.386	I(1)	Δ(US10YTB)	-10.309***	I(1)
LUSCPI	-0.406	I(1)	Δ(LUSCPI)	-7.589***	I(1)
USU	-0.756	I(1)	Δ(USU)	-5.147***	I(1)
LUSCA	-1.294	I(1)	Δ(LUSCA)	-12.530***	I(1)
USFFR	-1.080	I(1)	Δ(USFFR)	-3.761***	I(1)
LUSMB	1.663	I(1)	Δ(LUSMB)	2.999***	I(1)
LUSM2	-0.263	I(1)	Δ(LUSM2)	-3.275**	I(1)
LUSGCTR	-1.625	I(2)	Δ(LUSGCTR)	-1.820	I(2)
LUSGCEGI	1.528	I(1)	Δ(LUSGCEGI)	-2.654*	I(1)

Note: See, Table A1.
Source: See, Table A1.

Table A4. *Vector Autoregression Estimates (1995:01-2008:11)*

Variables	$djia_t$	$rgdp_t$	i_{10YTB_t}	p_t	u_t	ta_t
$djia_{t-1}$	0.762***	0.020**	1.152***	-0.009*	0.107	0.042
	(0.090)	(0.009)	(0.432)	(0.005)	(0.266)	(0.037)
$djia_{t-2}$	-0.015	0.011	-0.424	0.010**	-0.308	-0.001
	(0.086)	(0.009)	(0.416)	(0.005)	(0.256)	(0.036)
$rgdp_{t-1}$	0.436	0.492***	0.865	-0.029	-4.332*	-0.527*
	(0.778)	(0.079)	(3.840)	(0.043)	(2.308)	(0.322)
$rgdp_{t-2}$	0.729	0.296***	-7.688*	0.114***	-3.830	-0.182
	(0.840)	(0.085)	(4.047)	(0.047)	(2.490)	(0.348)
$i_{10YTB_{t-1}}$	-0.010	-0.003**	1.015***	0.002**	0.030	-0.005
	(0.017)	(0.002)	(0.081)	(0.001)	(0.050)	(0.007)
$i_{10YTB_{t-2}}$	0.004	0.001	-0.186***	-0.002***	0.003	0.002
	(0.016)	(0.002)	(0.078)	(0.001)	(0.048)	(0.007)
p_{t-1}	-1.399	-0.177	8.369	1.193***	5.620	-0.488
	(1.295)	(0.131)	(6.239)	(0.076)	(3.839)	(0.536)
p_{t-2}	0.071	-0.020	-11.514*	-0.389***	2.053	0.869
	(1.249)	(0.126)	(6.017)	(0.069)	(3.702)	(0.517)
u_{t-1}	-0.016	0.001	0.007	0.001	0.372***	0.006
	(0.027)	(0.003)	(0.130)	(0.002)	(0.080)	(0.011)
u_{t-2}	0.011	0.001	0.046	-0.001	0.160**	-0.004
	(0.024)	(0.002)	(0.118)	(0.001)	(0.073)	(0.010)
ta_{t-1}	-0.121	-0.019	-1.329	0.035***	-0.159	0.611***
	(0.203)	(0.020)	(0.977)	(0.011)	(0.601)	(0.084)

ta_{t-2}	0.326	-0.039*	0.177	-0.023**	-0.109	0.184***
	(0.204)	(0.021)	(0.984)	(0.011)	(0.605)	(0.085)
c_0	-4.845	1.706***	48.647***	-0.141	35.864***	3.680**
	(3.770)	(0.381)	(18.165)	(0.209)	(11.178)	(1.562)
$i^{eff}_{FF_t}$	-0.009	-0.001	-0.002	-0.001	-0.055**	0.001
	(0.008)	(0.001)	(0.040)	(0.001)	(0.024)	(0.003)
mb_t	-0.199*	-0.018*	0.551	-0.032***	0.637**	0.041
	(0.095)	(0.010)	(0.457)	(0.005)	(0.281)	(0.039)
m_t	0.117	-0.039	-1.428	0.005	3.199***	-0.133
	(0.346)	(0.035)	(1.668)	(0.019)	(1.026)	(0.143)
t_t	0.517**	0.043*	1.608	-0.010	-1.686**	0.096
	(0.255)	(0.026)	(1.227)	(0.014)	(0.755)	(0.105)
g_t	-0.098	0.150***	2.880**	0.077***	-1.589*	0.098
	(0.301)	(0.030)	(1.450)	(0.017)	(0.893)	(0.125)
R^2	0.981	0.999	0.962	0.999	0.967	0.981
SEE	0.042	0.004	0.201	0.002	0.123	0.017
F	452.884	8461.297	223.272	19871.32	260.825	456.883
N	167	167	167	167	167	167

Note: See, Table A1.
Source: See, Table A1.

Table A5. *Johansen Cointegration Test*

Sample: 1995:01-2008:11 - Included Observations: 168- Trend assumption: Linear deterministic trend- Series: LUSDJIA, LUSRGDP2012, US10YTB, LUSCPI, USU, LUSCA
Exogenous Series: USFFR, LUSMB, LUSM2, LUSGCTR, LUSGCEGI

Rank	Eigenvalue	Trace Statistic	Critical Value (0.05)	Max-Eigen Statistic	Critical Value (0.05)
r = 0	0.4369	216.810	95.754***	96.470***	40.078
r ≤ 1	0.2947	120.340	69.819***	58.647***	33.877
r ≤ 2	0.1815	61.693	47.856***	33.638***	27.584
r ≤ 3	0.1265	28.056	29.797*	22.722**	21.132
r ≤ 4	0.0312	5.334	15.495	5.332	14.265
r ≤ 5	0.0001	0.001	3.841	0.001	3.841

Note:
Trace test indicates 3 cointegrating eqs. at the 1% level (***) and 1 cointegrating eq. at 10% level (*); *** denotes rejection of the hypothesis at the 5% level and * rejection of the hypothesis at the 10% level.
Max-eigenvalue test indicates 3 cointegrating eqs at the 1% level (***) and 1 cointegrating eq. at the 5% level (**); *** denotes rejection of the hypothesis at the 1% level and ** rejection of the hypothesis at the 5% level.
Source: VAR of Table A4.

Table A6. *Vector Autoregression Estimates (2008:12-2023:12)*

Variables	$djia_t$	$rgdp_t$	i_{10YTB_t}	p_t	u_t	ta_t
$djia_{t-1}$	0.816***	-0.007	0.652*	0.006	2.274**	0.004
	(0.077)	(0.016)	(0.385)	(0.005)	(1.125)	(0.030)
$djia_{t-2}$	0.018	0.011	-0.974***	-0.003	-3.799***	-0.010
	(0.076)	(0.016)	(0.381)	(0.005)	(1.116)	(0.030)
$rgdp_{t-1}$	-0.449	0.576***	3.093	-0.023	-4.587	-0.333**
	(0.411)	(0.086)	(2.066)	(0.026)	(6.046)	(0.161)
$rgdp_{t-2}$	0.790*	0.031	-2.623	-0.001	-1.606	-0.089
	(0.421)	(0.088)	(2.118)	(0.027)	(6.199)	(0.165)
$i_{10YTB_{t-1}}$	0.008	0.001	1.098***	0.002**	-0.178	0.004
	(0.016)	(0.003)	(0.079)	(0.001)	(0.232)	(0.006)
$i_{10YTB_{t-2}}$	0.001	-0.001	-0.183**	-0.002*	0.187	-0.015
	(0.017)	(0.004)	(0.085)	(0.001)	(0.249)	(0.007)
p_{t-1}	-0.950	0.096	14.579***	1.316***	-33.558**	0.712
	(1.092)	(0.227)	(5.488)	(0.069)	(16.059)	(0.427)
p_{t-2}	0.411	-0.156	-11.696**	-0.346***	37.111**	-0.847*
	(1.165)	(0.242)	(5.854)	(0.075)	(17.166)	(0.455)
u_{t-1}	-0.006	-0.001	0.046	-0.001	0.508***	-0.007***
	(0.006)	(0.001)	(0.031)	(0.001)	(0.091)	(0.002)
u_{t-2}	0.016***	0.003***	-0.030	-0.001	-0.036	0.002
	(0.006)	(0.001)	(0.028)	(0.001)	(0.083)	(0.002)
ta_{t-1}	0.007	0.082**	-0.328	-0.007	0.286	0.352***
	(0.197)	(0.041)	(0.991)	(0.013)	(2.900)	(0.077)
ta_{t-2}	0.533***	-0.099***	0.241	-0.021**	6.895***	0.180***
	(0.181)	(0.038)	(0.908)	(0.012)	(2.658)	(0.071)
c_0	-1.734	3.077***	-3.585	0.229	-3.455	4.134***
	(3.100)	(0.645)	(15.584)	(0.199)	(45.599)	(1.212)
$i^{eff}_{FF_t}$	-0.001	0.013***	0.020	0.001	-0.467***	0.025***
	(0.013)	(0.003)	(0.065)	(0.001)	(0.191)	(0.005)
mb_t	-0.021	-0.011	-0.310	0.001	2.627***	0.028
	(0.058)	(0.012)	(0.293)	(0.004)	(0.858)	(0.023)
m_t	0.420***	0.085***	0.742	0.001	-1.394	-0.070
	(0.125)	(0.026)	(0.629)	(0.008)	(1.841)	(0.049)
t_t	0.008	0.106***	0.177	0.008	-10.064***	0.145***
	(0.123)	(0.026)	(0.618)	(0.008)	(1.807)	(0.048)
g_t	-0.100	-0.066	-2.404*	0.007	16.948***	-0.002
	(0.256)	(0.053)	(1.287)	(0.016)	(3.767)	(0.100)
R^2	0.991	0.994	0.940	0.999	0.932	0.839
SEE	0.044	0.009	0.220	0.003	0.642	0.017
F	1021.274	1473.556	149.722	13109.00	132.006	49.786
N	181	181	181	181	181	181

Note: See, Tables A1 and A4.
Source: See, Table A1.

Table A7. *Johansen Cointegration Test*

Sample: 2008:12-2022:06 - Included Observations: 154 - Trend assumption: Linear deterministic trend -Series: LUSDJIA, LUSRGDP2012, US10YTB, LUSCPI, USU, LUSCA
Exogenous Series: USFFR, LUSMB, LUSM2, LUSGCTR, LUSGCEGI

Rank	Eigenvalue	Trace Statistic	Critical Value (0.05)	Max-Eigen Statistic	Critical Value (0.05)
r = 0	0.4922	249.510	95.754***	104.371***	40.078
r ≤ 1	0.4422	145.139	69.819***	89.900***	33.877
r ≤ 2	0.1905	55.239	47.856***	32.541**	27.584
r ≤ 3	0.1018	22.698	29.797	16.539	21.132
r ≤ 4	0.0342	6.159	15.495	5.365	14.265
r ≤ 5	0.0051	0.794	3.841	0.794	3.841

Note: Trace test indicates 3 cointegrating eqs. at the 1% level (***); *** denotes rejection of the hypothesis at the 1% level. Max-eigenvalue test indicates 2 cointegrating eqs at the 1% level (***) and 1 cointegrating eq. at the 5% level; *** denotes rejection of the hypothesis at the 1% level and ** rejection of the hypothesis at the 5% level.
Source: VAR of Table A6.

Table A8. *Effectiveness of Public Policies*

	Old Regime: 1995:01 – 2008:11					
	p	u	$rgdp$	i_{10YTB}	$djia$	ta
i_{FF}^{eff} ρ (=>)	-0.486	-0.706 (14.175***)	-0.487 (3.434**)	0.741	-0.258	0.604 (2.660*)
mb	0.965 (18.949***)	0.153 (5.354***)	0.968	-0.833 (4.207**)	0.768	-0.879
m	0.989 (4.303**)	0.121 (5.165***)	0.987 (5.682***)	-0.843 (5.900***)	0.794	-0.885
t	0.963 (3.106**)	-0.174 (4.677**)	0.971	-0.706	0.877	-0.792
g	0.997 (9.476***)	0.108 (2.961*)	0.974 (3.569**)	-0.794 (3.292**)	0.758	-0.836
	$\rho_{g,mb} = 0.968$ and g => mb (3.698**),		$\rho_{g,m2} = 0.989$ and g => $m2$ (9.189***)			
	New Regime: 2008:12 – 2023:11					
	p	u	$rgdp$	i_{10YTB}	$djia$	ta
i_{FF}^{eff} ρ (=>)	-0.589 (4.347**)	0.392 (25.024***)	-0.515 (19.978***)	0.203	-0.565	-0.249 (10.634***)
mb	0.963	-0.712 (9.040***)	0.950 (11.366***)	-0.503	0.938	0.621
m	0.975	-0.811 (10.262***)	0.972 (18.508***)	-0.663	0.902 (3.030*)	0.714 (9.875***)
t	0.919	-0.841 (17.462***)	0.948	-0.572 (2.550*)	0.897	0.647 (4.326**)
g	0.908	-0.597 (12.521***)	0.909	-0.651	0.867 (2.974*)	0.560
	$\rho_{g,iFF} = -0.326$ and g => i_{FF} (3.211**)					

Note: See, Table A1; $\rho_{i,j}$ = correlation coefficient, => = causality, F-Statistic in parenthesis [i.e., => (14.175***)].

Source: See, Table A1.

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Perceived Factors of Performance Management and Development Systems in a South African State-Owned Company

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Continuous performance management helps managers track employees' progress against goals and personal development and make informed decisions about additional compensation. Knowledge of performance management and development system (PMDS) factors within South African state-owned companies may assist managers in successfully implementing the PMDS to improve employee performance. The study explores the perceived PMDS factors by using an open-ended research approach. The study had an exploratory research design and a qualitative research method within interpretivism as the research philosophy, with semi-structured face-to-face interviews conducted to collect data. A purposive sampling technique was used to include the relevant participants. Thematic analysis with deductive and inductive coding was used. The themes that were identified were: favouritism, working in silos, insufficient capacity building, ineffective performance management, incompetent and unethical managers, complicated scorecard template, misconception of the performance management process, financial constraints and a lack of strategic plans. Knowledge of the PMDS factors would allow management to proactively identify potential areas for improvement. Poor decisions could lead to failure to achieve organisational goals and ultimately to high staff turnover. The study found that the PMDS should be aligned with the company's mandate and that management should have a better understanding of employee perceptions; it recommends ways of improving the effective implementation of the PMDS.

Keywords: *employees, perceptions, South Africa, state-owned company*

Introduction

This research was carried out at a South African state-owned company. State-owned companies have played a huge role in many economies, particularly in the emergence of transformation in nations, because the ultimate purpose of state-owned entities is to maximise the value of society through an efficient allocation of resources. In the current dynamic and rapidly changing environment, state-owned companies must design, implement and effectively manage their employees' performance (Sulistyo et al. 2020). Mayne and Goni (2017) emphasise that supervisors in state-owned enterprises are responsible for reinforcing the connection between employee performance and organisational goals because effective service delivery in state-owned enterprises is not

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possible in the absence of a sound performance management and development system (PMDS).

Research Problem and Objective

State-owned companies are important in the South African economy. In key sectors such as electricity, transport (air, rail, freight and pipelines) and telecommunications, such companies play a lead role, often defined by law, although limited competition is allowed in some sectors such as telecommunications and air. Continuous performance management helps managers who work at state-owned companies to track employees' progress against goals and personal development and make informed decisions about additional compensation. A performance management and development system (PMDS) is a key strategic issue for state-owned companies in South Africa. It is not clear what the PMDS factors in South African state-owned companies are. Knowledge of such factors may assist managers in successfully implementing the PMDS at state-owned companies to improve employee performance.

The study explored the perceived PMDS factors at a selected South African state-owned company by using an open-ended research approach.

Literature Review

Armstrong (2015, p. 9) views performance management as an ongoing process of enhancing performance through setting individual and team goals that are in line with the strategic objectives of the organisation; planning performance to attain the goals; reviewing and assessing progress, skills, and abilities; and developing the knowledge and understanding of employees. Jain and Gautam (2016, p. 236) also believe that the PMDS is an ongoing process of identifying goals and objectives and aligning individual goals and objectives to an organisation's strategic goals by providing meaningful and accurate feedback. Semi (2022, p. 3) defines PMDS as a planned and integrated approach that helps companies attain long-term goals by enhancing employees' performance and expanding their capacity.

According to Atmala et al. (202, p. 1), PMDS has the following goals: 1. assist employees in identifying the knowledge and skills needed to do their jobs efficiently and encourage them to do the right tasks in the right way; 2. boost employee performance by encouraging employee empowerment, motivation and implementation of effective reward mechanisms; 3. improve the two-way communication system between supervisors or company managers and employees to clarify company expectations regarding employee roles and accountability in carrying out work, communicate functional and organisational goals and provide regular and transparent feedback to enhance employee performance and continuous development; 4. identify barriers to more effective performance and resolve these barriers through monitoring, coaching and development; 5. create the basis for administrative decisions on strategic planning, succession planning, promotion, compensation and performance- based remuneration; and 6. promote employees' self-development and advancement in their careers by

helping them to acquire the desired knowledge and skills. To achieve these goals, state-owned companies need to know the PMDS factors. The Collins Dictionary (n.d.) defines a factor as one of the things that affects an event, decision, or situation.

Hussain and Zafar (2017, p. 3) state that PMDS factors that affect employee performance in state-owned companies are good leadership, organisational culture, training and development, rewards and incentives and a balanced scorecard:

- Hidiroglu (2021, p. 113) concurs with Hussain and Zafar (2017, p. 3) in the sense that good leadership encourages employees to perform optimally.
- Since organisational culture is directly linked with HR practices, it also positively impacts employee performance and adaptability, helping employees overcome corporate challenges and situations and directing them towards achieving a common goal or objective (Zafar et al. 2017, p. 3).
- According to Engetou (2017, p. 5), training programmes aim to maintain and improve recent job performance while developing skills for future jobs.
- Noorazen, Sabri and Nazir (2021, p. 41) argue that the reward system is the main concern of human resource management performance and service compensation management.
- The balanced scorecard (BSC) is considered the most common tool used to improve the performance of employees in both the public sector and state-owned companies because it incorporates the strategic objectives of the business into a distinct and balanced framework (Jugmohun 2018, p. 52).

More PMDS factors were found in the literature:

- Favouritism: Egwuonwu (2023, p. 62) found that favouritism could have negative effects when the underlying causes were unrelated to employee performance and when other employees felt disadvantaged.
- Working in silos: De Waal et al. (2019, p. 14) found that organisations and their leaders could benefit from effective silo-busting and thus better internal collaboration. In turn, this improved collaboration would boost the performance levels of organisations.
- Insufficient capacity building: According to Saldanha (2006, p. 35), capacity building is influenced by a multitude of variables. One of these variables is financing. Through proper strategic planning, such financing must be made available for the organisation and employees to grow and contribute to their own performance and that of the organisation.
- Ineffective performance management: Weis and Hartle (2023, p. 9) state that a performance management process must reflect measurable results and demonstrate the "right stuff" that leads to individual and organisational success. It can thus be deduced that not managing the performance management process efficiently will lead to ineffective performance management.
- Incompetent and unethical managers: Shi, Wang and McGinley (2023, p. 1) found that abusive supervisors might experience embarrassment and thus be more likely to use impression management tactics, such as an apology. The

study revealed the boundary conditions related to managers' unethical and abusive behaviours.

- Complicated scorecard template: Three evidence-based recommendations to improve the likelihood of successful balanced scorecard (BSC) implementation were researched. First, a strategy map should be developed in conjunction with BSC adoption. This critical but often ignored step helps ensure that BSC measures are causally linked to strategic goals. Second, top management team (TMT) commitment to BSC adoption is critical, as it increases the likelihood of sufficient resource allocation and positively influences organisational commitment and coordination. Finally, broad participation in the BSC development process and frequent communication about the BSC deployment help to engage key stakeholders. All three of these managerial actions improve organisational competency, commitment and coordination, the three foundational requirements of effective strategy implementation (Tawse & Tabesh 2023, p. 132).
- Misconception of the performance management process: A study by Berdicchia, Bracci and Masino (2023, p. 1) revealed that perceived PMS accuracy was positively associated with both intrinsic and extrinsic motivation, and participation in decision-making and task uncertainty both positively moderated the relationship between perceived PMS accuracy and extrinsic motivation.
- Financial constraints: Many companies have a typical merit-based pay scheme where the outcome of an individual performance appraisal is used to drive the increase in base salary through the performance management system (Weiss & Hartle 2023, p. 94). This will not be possible if the company does not budget for it.
- A lack of strategic plans: Strategic planning, which consists of three dimensions – the desires of external stakeholders, a company's internal encouragement and a company's database – significantly influences the competitive advantage of companies (Mulyaningsih et al. 2023, p. 1).

As mentioned before, knowledge of the PMDS factors may assist managers in successfully implementing the PMDS at state-owned companies to improve employee performance. Next, the research method will be discussed.

Research Method

Research Design

In this study the researchers used the interpretivism paradigm (Rehman & Alharthi 2018, p. 51) with an ontological stance: PMDS practices were studied by exploring the perceived factors of the PMDS in a South African state-owned company. An exploratory research design and a qualitative research method within interpretivism as the research philosophy was adopted. This method was selected as it enables in-depth data collection which is directly related to personal feelings and emotions and its

application is exploratory (Rahi 2017, p. 2); it also generates more understanding of a phenomenon in a natural setting (Austin 2014, p. 10). The data of this study were collected using face-to-face interviews.

Sample

The sampling technique used for this study was purposive sampling because the researcher had to draw a sample and select participants who had in-depth knowledge of the PMDS processes (i.e., contracting, evaluation and outcomes) at the state-owned company (NECSA). The purposive sampling technique is the deliberate choice of participants due to the qualities the participants possess. According to Etikan, Musa and Alkassim (2015, p. 2), purposive sampling is a non-random technique that does not require underlying theories and a total number of participants; the researcher decides what needs to be known and sets standards to find available participants willing to offer working experience information. Therefore this study used purposive sampling – the population needed for the study was known.

The inclusion criteria for selecting participants were as follows:

- Participants were permanent NECSA employees based in Pelindaba.
- Participants were NECSA employees with a minimum of three years of working experience.
- Participants were willing and available to participate in the study.

The sample size of this study was twelve participants representing diverse professions. The sample had six HR business partners from different divisions within the company, one lead auditor, one EAP practitioner, one safety manager and three scientists. Furthermore, the sample was selected using purposive sampling because purposive sampling is a non-random technique that does not require underlying theories and a total number of participants (Etikan et al. 2015, p. 2).

Measuring Instrument

The data of this study were collected using semi-structured interviews; the advantage of using interviews is that they provide in-depth information. This involved direct personal contact with all respondents who were asked a set of questions about PMDS practices. The interviews were face-to-face and interview questionnaires were used for all participants. The duration of the interviews was 30 minutes. Before data collection, the researcher conducted a pilot study since the data were rich, involving three NECSA employees from different divisions who met the inclusion criteria. Doody and Doody (2016, p. 2) opine that a "pilot study is a small-scale version of planned research conducted with a small group of participants similar to those recruited later in the larger-scale study". Pilot studies are carried out to enable researchers to practise and test the effectiveness of planned data collection and method analysis. The saturation of data was taken into consideration.

Data Collection

Semi-structured face-to-face interviews were conducted. The researcher collected the data by interviewing 12 employees who were knowledgeable about the PMDS and who were prepared and willing to participate in the study. A recording device was used to record the data and thereafter the data were transcribed as the interview response.

Data Analysis

A thematic analysis method was used to analyse the collected data from the participants. Thematic analysis involves the meaning and interpretation of data: researchers allocate codes and assign themes to the collected data (Neuendorf 2019, p. 211). According to Guest et al. (2011, p. 15), thematic analysis is regarded as a rigorous and inductive predictable process designed to identify and examine themes from word-based data in a transparent and dependable way. Following the thematic analysis technique the audio recordings were transcribed, after which the data were organised, coded and grouped and themes were constructed, refined and finalised. Deductive (codes) derived from the literature review and inductive (new codes) coding were used.

Trustworthiness

The trustworthiness criteria suggested by Maxwell (2013, pp. 125–136) were met as set out below.

Credibility: The credibility of this study was enhanced by collecting rich data using an interview and asking open-ended questions. The data were recorded using a recording device. The researcher then transcribed the recorded data. The researcher used quasi-statistics because qualitative study functions as quasi-statistic. The researcher did not conduct member checking due to the busy schedules and many commitments of participants. Candela (2019, p. 621) describes member checking as "the process in which the researcher asks one or more participants in the study to check the accuracy of the account". This check entails returning the findings to the participants and asking them (in writing or an interview) to check the accuracy.

Transferability: The researcher achieved this by providing a thick description of the individuals and the research process to allow the reader to test whether the findings were generalised to the theoretical setting. Generalising a theoretical proposition is known as an analytical generalisation (Korstjens & Moser 2018, p. 122).

Dependability: The researcher explained the steps followed in the research methodology in detail so that other researchers wishing to duplicate this study would have similar findings and achieve the same results. Therefore, the researcher gave all records of how this study was conducted to the supervisors for audit purposes. They were stored on a compact disk and were kept safe in the researcher's locked cabinet at home.

Confirmability: An audit trail is a qualitative strategy that establishes the confirmability of a research study's findings, whereas confirmability involves findings that are based on participants' responses instead of the researcher's preconceptions and biases (Wolf & Robinson 2015, p. 1). An audit trail was achieved by giving the

supervisors the audio recordings so that they could verify that the researcher had not fabricated the data. In addition, the researcher achieved confirmability by objectively reporting the data, also known as bracketing.

The main themes were identified, which led to the conclusions and recommendations.

As set out in Table 1, the majority of participants were male (8), with 4 females. There were 10 black and 2 white participants in the sample. Only 2 out of 10 were scientists; there was 1 safety manager and the rest were HR professionals.

Table 1. *Demographics of the Respondents*

PARTICIPANT no.:	AGE	GENDER	QUALIFICATION	JOB GRADING	RACE
P1	37	Female	Degree in Internal Audit	D2	Black
P2	39	Female	Honours degree in Industrial Psychology	DI	Black
P3	38	Female	B.Com degree in Human Resource Management	C3	Black
P4	36	Female	One-year certificate in Human Resource Management	C3	White
P5	29	Male	National Diploma in Human Resource Management	C2	Black
P6	55	Male	Diploma in Education, Training, Development	D1	White
P7	62	Male	PhD in Science	D3	Black
P8	37	Male	Honours degree in HRM	D1	Black
P9	51	Male	Degree in Safety Management	D2	Black
P10	38	Male	PhD in Chemistry	D3	Black
P11	52	Male	Doctorate Degree in Science	D2	Black
P12	39	Male	Master's Degree in Psychology	C4	Black

Ethical Considerations

This study followed ethical considerations that were suitable and acceptable, as recommended by Greenberg and Baron (2008, p. 736). These involved steps to ensure that participants were not affected during the study and that no financial bribes or other benefits were offered to participants. To ensure confidentiality, the participants were not identified in the study and the researcher recorded only what was discussed during the interviews. Sensitive or private information relating to a research participant's private sphere was respected and considered confidential and therefore did not have to be disclosed. Participants completed the TUT informed-consent form which defined the nature of the study. The researcher read, explained and interpreted the TUT ethical guide to all the participants before the face-to-face interviews started to ensure that participants understood their rights and the purpose of the research. To set participants at ease, the informed consent forms stipulated freedom of choice to participate or not. Permission to conduct this research was obtained from the Group CEO, Mr Don Robertson.

Findings

The following themes were identified in this study: Favouritism, working in silos, insufficient capacity building, ineffective performance management, incompetent and unethical managers, complicated scorecard template, misconception of the performance management process, financial constraints and a lack of strategic plans.

Theme 1: Favouritism

Several of the participants had experienced favouritism during the performance measurement process. For example, Participant 1 stated:

> *"Some of the management are biased, and PMDS is not used effectively because there's a lot of favouritism and people are not genuine and honest when they score. It is like they look on the faces of people and they say that because I favour him/her I will rate him/her like this, and because this one I don't like them I won't rate them".*

Participants 4 and 5 had similar sentiments:

> *"Another factor is that PMDS goes with favouritism because if your manager favours you he/she will score you higher, and you find that there are also those employees who are performing at their level best, but because the manager is not in good relation with certain employees he won't score them. To me, that is very much unfair". (Participant 4)*
> *"The factor that negatively influences PMDS is favouritism, and it demotivates employees to complete their scorecard most of the time because they know that even if an employee scores him/herself higher, the manager will reduce the scores because of favouritism. Favouritism plays a huge role to PMDS here". (Participant 5)*

While some of the participants broadly highlighted the prevalence of favouritism within the employee performance management processes at their organisation, one participant noted more aggressive forms of discrimination such as racism. For example, Participant 10 asserted:

> *"South Africa has a race problem. And that's another issue which maybe it's bringing us down because now if you've got different groupings and want to advance their people, it might be another factor. That's it is on the table".*

Some participants made recommendations for putting an end to favouritism. For example, Participant 5 suggested:

> *"When the appraisal is done, they should be a middleman because favouritism plays a huge role during the appraisal period, but if there can be someone during that period, the favouritism will be eliminated. Unlike [when] it is between the employee and the manager because if your manager does not favour you, they can reduce the scores so that you don't benefit from pay progression while you are performing and doing your best".*

Theme 2: Working in Silos

Some of the participants highlighted that working in silos was a factor impeding the successful implementation of the PMDS. For example, Participant 10 stated:

> *"If you look at us, we're working in silos. Meaning that if we work in silos, we give ourselves individual projects. We don't have projects. But, as it is presently, it's like people have individual progress projects".*

In a similar vein, Participant 4 asserted:

> *"What I can say is that we are not informed of PMDS in the forms of roadshows or workshops. So, I find it working as an isolated system where it is not integrated with talent management and succession planning. I don't know what NECSA goals are and whether they are achievable or not".*

To give some context to why people worked in silos at NECSA, Participant 1 situated this organisational behaviour in a historical context. Participant 1 stated:

> *"Maybe one of the challenges that come through is the history because historically there were ten people, and they were just doing their things".*

Some of the participants pointed out the adverse effects of working in silos. For example, Participant 10 asserted:

> *"They take longer than they're supposed to be taking because the individual is working in silos. And there's too much repetition. You'll notice that there's another department doing this, and there's another one doing that; it's the same thing. Whereas if we were working as a team, we would know that okay, no, this is what we are doing. In the end, targets are so difficult to achieve".*

Theme 3: Insufficient Capacity Building

Several participants cited a lack of training among managers as an impeding factor in the successful implementation of the PMDS, particularly capacity building. For example, Participant 4 stated:

> *"The line managers don't know the process very well because they are not trained, and they don't have enough knowledge and understanding when it comes to PMDS".*

In support of the statement above, Participant 12 said:

> *"I think very few managers try to do it as objectively as possible, but for the majority of them, it is not an objective process; they also don't have the know-how nitty-gritty of how the performance reviews are redone".*

Some participants alleged that financial constraints hindered the successful implementation of the capacity-building aspect of the PMDS and added that there was a

preferential distribution of funds for capacity-building. For example, Participant 12 stated:

> *"There are some people who attend courses, but most of the time, they will tell you that you cannot go and attend the courses because there's no money in the company".*

Similarly, Participant 3 insinuated that there might be personal reasons for the skills gap, a factor hampering the successful implementation of the PMDS. Participant 3 stated:

> *"Close gaps such as skills gaps because sometimes non-performance issues, is not all of the poor performance but you will find that personal issues are also contributing".*

Besides insinuations of foul play by other participants, Participant 1 pointed out that capacity building was not encouraged. Participant 1 asserted:

> *"…in my view, is not a performance-based organisation where they encourage people to perform at their level best. In terms of development as well, to continue further their studies, it is like you are on your own".*

To substantiate the assertion above, Participant 1 added:

> *"The issue of career ladder helps… the norms and the standards also help, but I am not sure if they are fully implemented, because there are a lot of grievances. When you look at, whether you go to school or not, it will be your initiative because most of the managers won't push and encourage you to further your studies".*

Theme 4: Ineffective Performance Management

Ineffective performance management was cited as an impeding factor in the successful implementation of the PMDS at NECSA. To put this assertion in perspective, participants focused on why they undertook performance management at NECSA and highlighted the limitations of implementing the PMDS. For example, Participant 8 pointed out:

> *"The reason we do performance management is to see whether the employees are performing or not. I don't think there are enough follow-ups after performance management and appraisal. What is going to be done for those who are not performing after the appraisal? Are the managers drafting performance improvement plans to address the poor performance?"*

Participant 4 echoed this sentiment, noting that transparency was an added concern:

> *"After the final performance reviews, there's a moderation process. However, how the moderation process is handled is not transparent to us; we only know that the performance will be moderated, but we are not informed of the people involved in the moderation process. I find it to be odd because it is not communicated to the employees".*

In line with the assertion made above regarding insufficient follow-up, Participant 9 pointed out that the implementation of the PMDS sometimes did not draw on the outcomes emerging from the performance management system. Participant 9 stated:

> *"If you got a system where the results are not being properly analysed and implemented, that to me is the same as not having that system because it doesn't work for you. The Performance Management system is well-drafted, but the results are not implemented as per system requirements. Staff morale is going down because we got a system, and it is all right, but you don't even use those results".*

Several participants expressed similar concerns to those mentioned by Participant 9 regarding the adverse effects of ineffective performance management on staff morale. For example, Participant 10 highlighted issues around the rewards system at NECSA and the impact on people:

> *"I haven't heard anyone being rewarded for good performance. Since the first year I arrived here, I've seen some people performing very well, but they don't get any reward. Performance is not rewarded and as a result, that de-motivates a person who wants to work".*

Participant 2, whose views differed from those of some other participants regarding the rewards system and performance management, referred to the absence of a nuanced understanding of rewards and performance management. Participant 2 stated:

> *"We are not advanced, if I may put it like that. We are still lacking a lot in performance management; there's a lack of understanding because performance management is always associated with payments, and people lose the big picture of why we have to do performance management in the first place".*

Amid the contrasting perspectives highlighted above, Participant 7 pointed out that the PMDS was experienced differently depending on where employees were situated in the organisational structure. Participant 7 clarified why people experienced the PMDS differently:

> *"The system works for a certain level of employees, and to others, it doesn't work. It works for top management; upwards, and it works perfectly there. But the moment you move down the ranks, it doesn't work properly because the way you assess in terms of how to evaluate a person, it becomes difficult because most of the work is more routine than the target-orientated type of assessment".*

Theme 5: Incompetent and Unethical Managers

Participants in the study highlighted that the managers' incompetence and issues related to ethical codes at their organisation impeded the successful implementation of the PMDS. For instance, Participant 10 cited the insecurity of managers as a factor hindering employee performance:

> *"So maybe it's insecurity because if you look at some of the managers, for example, if someone with a PhD degree comes and he doesn't have a PhD degree. Then he may go to*

become the boss and maybe over me. I think it's a fear as well, that maybe if the more I push this one in terms of a personal development plan, there might be a performance".

Participant 10 elaborated on this:

"I think it's a willingness from the management side to say, let's reward performance. People that are doing well let us reward and support them so that they can perform better. I think those are the negative factors. Maybe people fear that they'll be criticised. But you know, when you're at the management level, you just have to yes".

This view was confirmed by Participant 1:

"Jealousy and lack of confidence in the management [is a negative factor] because if you are confident and you know what you are doing, why would you deprive [other] people if they are performing at their level best".

Several participants made suggestions. For example, Participant 7 proposed:

"In terms of performance, I think the process itself must improve how PMDS is conducted, and biases must be removed from the process".

Theme 6: Complicated Scorecard Template

Participants in the study highlighted that scorecards were used in the process of quantifying employee performance. For example, Participant 11 described the employee performance measurement tool as user-friendly:

"Our balance scorecard uses a five-point scale. The template is not very difficult to use because most columns are locked, so you cannot change the formulas or anything; you just need to put the information and score yourself from one to five. I will say the template is very user-friendly".

In a similar vein, Participant 10 asserted:

"It's fine because I'm just an end-user of it, so I'm happy with it. Yes. It's working well for me".

Contrary to the positive experiences described by a few participants, several participants lamented the use of a complicated scorecard template to measure employee performance. For example, Participant 1 complained:

"The template always changes every year we have to get an understanding from HRBSs. What do we do we just get the HRBPs to assist us? So, the template is not user-friendly".

Unlike Participant 1, who highlighted a lack of understanding of the complicated balanced scorecard, Participant 11 was not familiar with the scorecard template but cited incorrect application as a point of contention, stating:

"I am quite familiar with the balanced scorecard system but here at NECSA is not applied correctly".

Participant 5 shared this sentiment, emphasising the need for training to ensure the effective implementation of the scorecard:

> *"It is easy to use provided that line managers are trained on how to use the template as they are responsible for scoring employees".*

Participant 5 alleged that scorecards were a contributing factor to the favouritism cited as an impediment to the successful implementation of the PMDS. For instance, in advocating the integration of new technology as a means to end favouritism, Participant 5 pointed out:

> *"Manually, it is easy to cheat because your manager can change the scores at any time; there's a lot of favouritism in our company".*

Theme 7: Misconception of the Performance Management Process

While participants in the study were generally in agreement on the importance of performance management processes, Participant 2 clarified some misconceptions about what the process entailed. Participants 2 and 3 said:

> *"When we speak of performance management, we are speaking of strategies that have been formulated as to how we have to execute those plans that are set for us and also deliver on what we have set for ourselves. That part I feel it is misunderstood here". (Participant 2)*
> *"Most of the negative factors emanate from not understanding the system because if I didn't understand the system, I will then not comply. So, we need an understanding of the system". (Participant 3)*

To exemplify the misunderstanding referred to above, Participant 2 explained:

> *"It is not all of the incentives, but to ensure that performance is embedded that we are performing as an organisation. As a state-owned organisation, we have a shareholder contract, and as an organisation, we must ensure that we fulfil all the expectations set by the government. But that part is deemed not to be understood by everyone in the organisation".*

Participant 3 affirmed the statement regarding misconceptions about performance management processes, stating:

> *"The factors that can negatively influence PMDS, I think, is the lack of understanding of the system by all stakeholders such as management and the people who are implementing the system and the people who are supposed to conform to the system, which is employees. Without a proper understanding of the PMDS, the system won't be effective".*

To achieve the successful implementation of the PMDS, mainly as it related to a common understanding of performance management processes, Participant 3 recommended:

> *"Proper communication of the system and rolling out of the policies to a point where management feels comfortable that everyone complies and understands how the system works".*

Participant 8 highlighted that the institutional culture of NECSA did not reflect that performance management was valued:

> *"Performance management in my organisation has not been taken seriously as it should be. Employees are just doing it because somebody said they must do it. They don't understand that the salary they are getting talks to performance management. They are doing performance management because the organisation is paying them. So if the organisation's culture is not supporting it, the organisation won't go anywhere".*

Theme 8: Financial Constraints

Several participants said that the organisation's financial constraints were an impeding factor in the successful implementation of the PMDS. Participant 4 stated:

> *"With the financial state of our company, I don't know what to say anything when it comes to performance recognition and rewards".*

While Participant 4 insinuated that there was a link between the financial state of the organisation and performance recognition and rewards, Participant 9 attributed the decline in personnel development to the organisation's financial constraints:

> *"You see, in twelve months, you could have attended five training courses when I started in 2011. The development in terms of staff development is not the same as when I started here, so there has been a decline in terms personnel development, it can be attributed to, but budget constraints is a major issue in terms of staff development".*

Participant 12 made similar associations:

> *"There are some people who attend courses, but most of the time they will tell you that you cannot go and attend the courses because there is no money in the company".*

Theme 9: A lack of Strategic Plans

Strategic plans form an essential part of performance management. However, several participants pointed out that NECSA did not have a clear strategic plan. Participant 2 stressed this point:

> *"Here at NECSA, we don't have a strategy in place because since I started here at NECSA, I have not seen any strategy in place, and the strategy that we have has been formulated a couple of years back before I even came here".*

Participant 2 elaborated on the effect on the PMDS of not having a business plan, stating:

> *"Another factor is the lack of a business plan which negatively affects PMDS because when we do contract, we have to align it with the business plan, and in the absence of that people put anything they feel should be part of contracting which is not really in line with what we need to achieve as an organisation".*

While some participants believed that the lack of strategic plans was an impeding factor in the successful implementation of the PMDS, Participant 10 noted a strategy. Still, the challenge lay in the clarity of its directives. For example, Participant 10 stated:

> *"has an overall policy which is just vague. It's a little bit difficult because we don't know where we need to focus. If we can set up priorities straight and focus on what we actually should be doing well, then I think we could achieve our targets. There is not a clear guideline on how to reward performance".*

Participant 12 expressed similar discontent:

> *"I think doesn't have a good rewarding strategy for a long time; it has been battling to come up with a good strategy".*

Discussion

Favouritism

In this current study, many participants mentioned that management was biased and favoured certain employees. Favouritism can therefore negatively affect performance management and also lead to demotivation. Egwuonwu (2023:62) found that favouritism could have negative effects when the underlying causes were unrelated to employee performance and when other employees felt disadvantaged and this finding concurs with the finding of the current study

Working in Silos

It was found in the current study that there was a lack of an integrated PMDS system and there was a lack of working as a team. Working in silos therefore negatively affects the PMDS. De Waal et al. (2019, p. 14) on the other hand found that organisations and their leaders could benefit from effective silo-busting and thus better internal collaboration. In turn, this improved collaboration would boost the performance levels of organisations. It is therefore essential that collaboration and teamwork be ensured at this state-owned company.

Insufficient Capacity Building

In the current study, it was clear that the lack of training on how to properly execute the PMDS had a negative impact on performance appraisal. Some of the managers used a lack of money in the budget as a reason for not obtaining the necessary PMDS training. Inefficient capacity building is therefore a factor that negatively affects the PMDS at the

state-owned company. According to Saldanha (2006, p. 35), capacity building is influenced by a multitude of variables. One of these variables is financing. Through proper strategic planning, such financing must be made available for the organisation and employees to grow and contribute to their own performance and that of the organisation. This study of Saldanha (2006, p. 35) concurs with the findings of the current study.

Ineffective Performance Management

A lack of transparency in implementing the PMDS and insufficient follow-up were raised by some of the participants. It was also raised that ineffective performance management negatively affected the staff morale at the state-owned company. Some of the participants mentioned that the PMDS does not work for all levels of employees. Weis and Hartle (2023, p. 9) state that a performance management process must reflect measurable results and demonstrate the "right stuff" that leads to individual and organisational success. It can thus be deduced that not managing the performance management process efficiently will lead to ineffective performance management. The study of Weis and Hartle (2023, p. 9) concurs with the ineffective performance management factor of the current study.

Incompetent and Unethical Managers

Some of the participants said that insecure and jealous managers use the PMDS in an unethical manner. Fear of criticism also negatively affected the competent use of the PMDS. Shi et al. (2023, p. 1) found that abusive supervisors might experience embarrassment and thus be more likely to use impression management tactics, such as an apology. The study revealed the boundary conditions related to managers' unethical and abusive behaviours. This study's findings concur with the findings of this current study in the sense that incompetent and unethical managers negatively affect the correct use of the PMDS.

Complicated Scorecard Template

In the current study, it was found that a complicated scorecard template did not allow effective and proper performance evaluation. This PMDS factor had a perceived negative effect on the overall performance management in the state-owned company. According to Tawse and Tabesh (2023, p. 132), a strategy map, top management team (TMT) commitment to BSC adoption, broad participation in the BSC development process and frequent communication about the BSC deployment help to engage key stakeholders are essential elements in scorecard implementation. All three of these managerial actions improve organisational competency, commitment and coordination, the three foundational requirements of effective strategy implementation (It is clear from the findings of this current study that these three elements were not part of the PMDS at the state-owned company.

Misconception of the Performance Management Process

In the current study, it was found that a lack of understanding of the PMDS greatly affected the execution of the PMDS in a negative sense. It was also clear that the necessary seriousness of using the PMDS in a proper way was not evident. A study by Berdicchia et al. (2023, p. 1) revealed that perceived PMDS accuracy was positively associated with both intrinsic and extrinsic motivation, and participation in decision-making and task uncertainty both positively moderated the relationship between perceived PMS accuracy and extrinsic motivation. It was clear from the findings of the current study that the motivation levels of the participants were negatively affected due to the misconception of the PMDS.

Financial Constraints

Due to perceived financial constraints at the state-owned company, the participants raised the fact that there was no link between performance and rewards. There was also no money to attend certain courses as part of staff development. Many companies have a typical merit-based pay scheme where the outcome of an individual performance appraisal is used to drive the increase in base salary through the performance management system (Weiss & Hartle 2023, p. 94). Unfortunately, this was not the case at the state-owned company.

A Lack of Strategic Plans

Mulyaningsih et al. (2023, p. 1) found that strategic planning, which consists of three dimensions – the desires of external stakeholders, a company's internal encouragement and a company's database – significantly influences the competitive advantage of companies is extremely important for any company to survive and to be competitive. In the findings of the current study, it was, however, clear that there was a lack of strategic plans. This negatively affected the PMDS in the sense that there was no clear alignment between the company's mission and performance execution.

Practical/Managerial Implications

The management cadre of the selected state-owned company can utilise this study's findings to improve the implementation of the PMDS. Knowledge of the PMDS factors will also allow management to proactively identify potential areas for improvement. If the management of this South African state-owned company does not consider the identified PMDS factors, the implication may be that poor decisions could lead to a failure to achieve organisational goals and ultimately to increased staff turnover.

Limitations and Recommendations

A limitation of this study was that it had a small population size and was restricted to employees at NECSA, based in Brits, South Africa, where the researcher was an employee and a contracted PMDS candidate. Further limitations were that only 12 NECSA employees participated in the study and that it used a qualitative design, which afforded a once-only view of the PMDS at NECSA. Despite this limitation, the results can be generalised to theoretical propositions; according to Yin (2014, p. 257), this is called analytical generalisation.

Similar research should be conducted in other state-owned, government and private-sector organisations in the future because the PMDS is a broad topic with many interesting aspects to focus on. It is also recommended that to generalise the results, a larger sample should be used by other researchers when testing the relationships between variables in this study. Based on the literature and the study findings, the PMDS at NECSA will be effective and perceived positively by employees should NECSA's management implement the following recommendations:

- Train managers to link the performance indicators with the organisational strategy.
- Raise awareness of how the balanced scorecard is implemented.
- Link performance appraisal to rewards and career development.

Conclusion

What are the employees' perceptions of the PMDS factors at the SA state-owned company? The study findings aligned with the question. Amongst others, the perceptions were: favouritism, unachievable targets, not being involved in the contracting process, lack of training in the PMDS, complicated balanced scorecard template, the PMDS not being linked to rewards, and an electronic system for the PMDS not being in place at NECSA. The primary research objective was to determine employee perceptions of PMDS factors within SA state-owned companies and these were found to be negative. In conclusion, top management would find it challenging to improve the PMDS if the recommendations discussed in this study were not adequately implemented.

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Stress Testing Ghana's Debt Sustainability Analysis 2010-2021

*By Anthony Q. Q. Aboagye**

Ghana exited her 16th IMF Debt Bailout Programme in April 2019. Unfortunately, in May 2023, she signed on to her 17th IMF Debt Bailout Programme because the country's debt had once again become unsustainable. The question posed in this paper is, leading to 2021, did the authorities in Ghana undertake a thorough debt sustainability analysis? This study used the IMF-World Bank Debt Sustainability Framework for Low-Income Countries to analyse the dynamics of Ghana's debt over 2010-2021. Using averages of key variables over 2000-2009, the baseline scenario revealed that, had these averages prevailed, Ghana's debt ratio would have risen from 35% in 2009 to only 43% in 2021, a far cry from the actual 80.1% that drove her economy into a tailspin in 2022. The baseline scenario was stress tested assuming worsening scenarios of historical values of key variables. The results indicated that looking forward from 2009, moderate stress (worsening of the values of key variables by two standard errors) would be enough to make the year-on-year evolution of the debt ratio unsustainable. The cause of the ballooning debt ratio was traced to a primary balance that remained lower than its debt stabilizing value and Ghana having to borrow regularly to service previous debt.

Keywords: *debt sustainability analysis, stress test, Ghana, IMF, primary balance*

Introduction

In March 2021, Ghana borrowed USD 3 billion in the Eurobond market. At the same time, she announced plans to borrow another USD 1 billion in the last quarter of that year. However, this second issue did not materialize because by the third quarter of that year, it had become clear that the Eurobond market had become jittery about Ghana in respect of the quantum of Ghana's outstanding debt stock. In fact, the country's debt had been judged by the market to be unsustainable. This inability to borrow in the international capital market set off a chain of events that included the approach to the International Monetary Fund (IMF) for a three-year assistance programme midway through 2022. In December 2022, just before defaulting on her domestic and foreign debt servicing obligations, Ghana signed an IMF Staff Level Agreement. Under the agreement, she was to renegotiate new terms for the debts on which she had defaulted to render her debt sustainable. The restructuring of the debt has been referred to by the Ghanaian authorities as debt exchange – exchanging old debt for new debt under revised terms. By the end of February 2023, much of her domestic debt had

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been exchanged. On May 17, 2023, the IMF Management and Executive Board accepted Ghana's request to lend the country SDR 2.242 billion (USD 3 billion) over three years under strict conditions.

The crux of the matter here is that it had become the case that since Ghana returned to the international capital market in 2007 to borrow, the country would regularly borrow to payoff maturing debt plus to fund her budget deficits. Thus, Ghana had remained in perpetual debt. Not only that, the ratio of her debt stock to gross domestic product had been rising year-after-year. In 2014, Ghana was classified "moderate risk of debt distress". But by 2017 her situation had so deteriorated that she was reclassified "high risk of debt distress" and remained there in 2018. Since the second half of 2021, she's been in "debt distress" state.

Did Ghana not see her debt becoming unsustainable so soon after exiting her 16th IMF programme on April 2, 2019? Indeed, on April 3, 2019, having just exited her 16th IMF Programme the previous day, the country's President declared,

> *What I am saying to Ghanaians, to all of us, is that, in the 62 years of our independence, this was the 16th IMF bailout programme that the nation had gone into. Let it be the last time that we would resort to an IMF programme.*[1]

Because debt unsustainability had become common place among middle and low-income countries for some time, the IMF and World Bank had developed and revised a framework that establishes the debt and debt service thresholds that will apply when assessing the extent of risk of debt distress that these countries face (IMF 2005, 2012, 2013). The IMF and World Bank regularly conduct joint debt sustainability analysis (DSA) of countries and discuss results with country authorities. Without a doubt, Ghana was conscious of the need to undertake her own DSA. That, the Ghanaian authorities realise the importance of Ghana's debt to be sustainable is evident in statements made in every annual national budget statement delivered by the Minister of Finance on behalf of the president of the country from (2018 through 2021). Please see Appendix A for details.

There is ample evidence that the World Bank and the IMF have been undertaking individual and joint sustainability analysis of Ghana's debt. Their December 2019 joint analysis (IMF 2019) concluded that Ghana's risk of external debt distress was high. So was Ghana's overall risk of debt distress. Their April 2020 joint analysis (IMF 2020) reached the same conclusions. In fact, another joint analysis, dated September 2021 (IMF 2021), just before Ghana reversed her original decision to return to the international capital market in the last quarter of 2021 for yet another loan, reached exactly the same conclusion – high risk of external debt distress and high overall risk of debt distress. The results of these analyses are publicly available.

The DSA covered public and publicly guaranteed debt (financial sector clean-up costs and energy sector contingent liabilities). The DSA results were particularly sensitive to shocks affecting GDP growth, the primary balance, exports, foreign direct investment and exchange rate. The April 2020 DSA concluded that four out of five external debt indicators had breached thresholds of

[1]President speaking to the nation on April 3, 2019.

baseline scenario. And that breaches of acceptable bounds were identified in respect of i) the present value of external debt to GDP, ii) debt service to exports, iii) debt service to revenues and iv) total public debt to GDP ratio.

Much earlier, the June 2008 external DSA indicated that Ghana's external debt dynamics was subject to moderate risk of debt distress. However, when external and domestic debt were taken together, the overall assessment was that "Ghana's debt distress has increased compared to the 2007" due to "recent rapid accumulation of external and domestic public debt contracted on commercial terms, and high current account and fiscal deficits that expose the country to structural vulnerabilities in the event of a reversal of favorable terms of trade."

With such overwhelming evidence that the authorities were aware that there was the need for Ghana's debt to be sustainable, and also aware of the IMF-World Bank framework for assessing sustainability of sovereign debt, how come her debt became unsustainable so soon after exiting the 16th IMF Programme? How was Ghana's own DSA conducted? Surely, the Ghanaian approach to DSA analysis could not have deviated much from the IMF-World Bank framework. Did they not stress test their base analysis? If they did, what did their worsening scenarios reveal?

Following this introduction, is a brief review of the schools of thought on the effects of public borrowing and some African empirical evidence. Then, government budget constraints and borrowing are discussed. After this, the IMF-World Bank framework for assessing debt carrying capacity and sustainability is discussed. Baseline and stress tests results of an application of the IMF-World Bank framework for Ghana's DSA over the period 2010 to 2021 are reported and discussed in the context of Tax revenues, non-tax expenditures, interest payments, the real rate of interest, the real rate of growth of the economy and the primary balance. Finally, concluding statements are made.

Literature Review

Is Debt Beneficial?

Theoretical and empirical studies of the effect of sovereign debt on the dynamics of economic growth date back to the middle of the 20th century. The literature on the subject has coalesced to a number of schools of thought.

One is the *Neoclassical school*, which takes the position that increasing public debt has a negative effect on economic growth. Another is the *Keynesians school.* Keynesians argue that the effect of government debt is positive during economic recession. Then, there is the *Monetarist school,* which argues that the supply of money in an economy is the primary driver of economic growth. For, as the availability of money in the economy increases, aggregate demand for goods and services increases too. Finally, there is the *Ricardian school.* Their position is that the effect of debt on economic growth is neutral.

Kedir et al. (2023), using data on 48 African countries, 1991-2018, show that the link between country debt and growth of economy varies from country to country. They estimated country-specific response of growth to debt accumulation and

concluded that debt can enhance growth or be detrimental to growth depending on the quality of institutions. They advise researchers against overgeneralizations, based on average results. However, another study of the effect of sovereign debt on the economic performance of 41 African countries over 2002 to 2020 concluded that under no circumstance is debt beneficial. Authors (Kinyondo et al. 2021) admonished African countries to reduce their debts.

For many African countries, even when steps have been taken to reduce debt (e.g., Highly Indebted Poor Country Initiative), debt has built up again quickly. This is one reason why many development economists consider public debt a developmental challenge in Africa. UNICEF (2021) notes that, in Africa and other developing countries, debt servicing was exceeding expenditures on health, education, and social protection combined. On its part, the United Nations Economic Commission for Africa (2019) posits that in more recent times, debt servicing by African countries has been made more difficult by slow economic growth, deteriorating terms of trade, loose fiscal policies and tighter monetary policy by foreign central banks.

Budget Constraint

Typically, public debt servicing capacity is analysed by focusing on the primary balance, which is the difference between total government revenues less government's non-interest expenses. Thus, the primary balance indicates a government's debt servicing capacity. If the primary balance is not enough to service previously contracted debt, the government may borrow to pay interest on previous debt. Naturally, this increases the stock of public debt. Typically, to improve the primary balance, a government may try to increase tax revenues or reduce her non-interest expenses.

The budget constraint facing governments in any year requires that interest and non-interest expenses equal the sum of government revenues, additional borrowing and the amount of new money issued (domestic currency). If the government borrows from domestic and external sources, external borrowings may be analysed in the context of balance of payments. A macroeconomic accounting identity says that, when a country's spending exceeds her domestic output, domestic real investment will exceed domestic savings. The excess investment comes from foreign investors in the form of capital inflows to the country in question.

Another macroeconomic accounting identity says that, if a country's national spending exceeds her national income, then her imports must exceed her exports by the same amount. In a freely floating exchange rate system, the deficit must be paid for by external borrowing. Foreigners from whom the deficit country is borrowing are investing in the deficit country. It must be emphasized that these foreign investments must be paid back with interest.

Debt Sustainability

The literature has generally established that countries with good policies, good assets, strong institutions and positive macroeconomic prospects can sustain higher levels of external debt than others. A country's public debt, including

publicly guaranteed debt, is considered sustainable if she is able to meet all her current and future payment obligations without exceptional financial assistance or going into default.

In the literature, two main approaches to debt sustainability analysis are discussed. One is the debt-stabilizing primary balance approach. This approach focuses on the primary balance that would lead to achieving a pre-determined debt path, given assumptions about the real interest rate and growth rate of the economy. See for example, Ncube and Brixiová (2014) and Izák (2009). The other approach is debt path projections and how these relate to debt sustainability thresholds. This approach is more commonly used by the International Monetary Fund (IMF) and the World Bank. See for example, IMF (2005, 2012, 2013).

Debt-stabilizing Primary Balance Approach

This approach proceeds on the grounds that the cost of public debt servicing depends on the variables that determine the debt dynamics, namely, primary balance, outstanding debt stock, inflation rate and growth rate of the economy. Izak (2009) shows that the nominal amount of debt service is influenced by the primary balance, the real growth rate of the economy, the inflation rate and the change in debt stock. And that, debt service to GDP ratio increases with both the primary deficit (negative of primary balance) to GDP ratio and debt service to GDP ratio but decreases with GDP growth rate. To stabilize the debt-GDP ratio, the primary balance and the growth rate of the economy times the debt-GDP ratio must be able to finance the debt service.

From this perspective, the primary balance is important for fiscal sustainability. The primary surplus (positive primary balance) required for stabilization of the debt-GDP ratio is given by the differential between the real cost of debt and GDP growth rate multiplied by the Debt/GDP ratio. Ncube and Brixiová (2014) showed that public debt-to-GDP ratio may be reduced by accelerating growth, improving primary balances, and reducing the real interest (by raising inflation), and/or defaulting on their debt.[2]

Analysing the differential between the real interest rate and growth rate of 29 African economies, Ncube and Brixiová (2014) showed that high growth and negative real interests contributed to decline in debt burden in Africa from 2008 to 2012. However, for economies that borrowed on market terms, whether domestic (e.g., Kenya) or international (e.g., Ghana) the impact of real interest rates in lowering the debt burden was low. They also concluded that in more than half of the countries, the primary balance was above what was required to keep the debt-to-GDP ratio at its 2007 level. The insight is that the fiscal position of majority of the African countries was sustainable between 2008 and 2012.

Debt Path and Debt Sustainability Threshold Approach

For low (and middle) income countries with access to international capital markets, the IMF and the World Bank have developed a framework to help them

[2]Inflation impacts the debt-GDP ratio through lowering the real interest rat[e.]

analyse the likely evolution of their debt stock going forward, given certain conditions (IMF 2005, 2012, 2013).

Called the debt sustainability framework (DSF), it requires regular debt sustainability analysis of a country's projected debt burden over the next 10 years considering the country's vulnerability to economic and policy shocks. The framework uses a composite indicator that considers a country's historical performance, outlook for real growth, remittance inflows, international reserves, and other factors. Because countries vary in their ability to settle their debts, especially foreign debt, the DSF classifies countries' debt-carrying capacity into three categories – *strong, medium,* and *weak* with associated maximum thresholds. In determining debt-carrying capacity, at least three criteria are considered: the present value of external debt to gross domestic product (GDP), or to exports; present value of external debt servicing to countries exports ratio or to countries revenues; and present value of total public debt to country GDP. A country that is experiencing difficulties in servicing its debt, (in arrears, ongoing or impending debt restructuring) is said to be in *debt distress*. It is noted that debt sustainability also depends on the global environment through demand for exports, and for developing countries, remittance inflows.

IMF (2005, 2012, 2013) show that for a small open developing economy, like Ghana, the framework considers the country's public debt to GDP ratio (composite domestic and foreign), $\boldsymbol{d_t}$, to evolve according to the equation:

$$\boldsymbol{d_t} = \theta_t^* \, \boldsymbol{d_{t-1}} - (\boldsymbol{pb_t} + \boldsymbol{\mu_t}) \qquad (1)$$

where,

$$\boldsymbol{\theta_t^*} \equiv \frac{\mathbf{1}+\boldsymbol{i_t^*}}{(\mathbf{1}+\boldsymbol{g_t})(\mathbf{1}+\boldsymbol{\pi_t^*})} \qquad (2)$$

$$\boldsymbol{i_t^*} = \left((\mathbf{1}-\boldsymbol{\alpha})\boldsymbol{i_t^h} + \boldsymbol{\alpha} \boldsymbol{i_t^f}\right) + \boldsymbol{\alpha\varepsilon_t}(\mathbf{1}+\boldsymbol{i_t^f}) \qquad (3)$$

$\boldsymbol{i_t^*}$, is the effective nominal interest rate which is a weighted average of the domestic interest rate, $\boldsymbol{i_t^h}$, foreign interest rate, $\boldsymbol{i_t^f}$,

$\boldsymbol{\alpha}$ is foreign debt to GDP ratio, and

$\boldsymbol{\varepsilon_t}$ is the depreciation/appreciation rate of the domestic currency.

$\boldsymbol{g_t}$, is the real rate of growth of the GDP.

$\boldsymbol{\pi_t^*}$ is the GDP deflator which depends on the domestic inflation $\boldsymbol{\pi_t^h}$, foreign inflation $\boldsymbol{\pi_t^f}$, and exchange rate movements. It is given by,

$$\boldsymbol{\pi_t^*} = \left((\mathbf{1}-\boldsymbol{\beta})\boldsymbol{\pi_t^h} + \boldsymbol{\beta}\boldsymbol{\pi_t^f}\right) + \boldsymbol{\beta\varepsilon_t}(\mathbf{1}+\boldsymbol{\pi_t^f}) \qquad (4)$$

where, $\boldsymbol{\beta}$ is the output share of tradables in total GDP.

$\boldsymbol{pb_t}$ in equation (1) is the primary balance to GDP ratio, while $\boldsymbol{\mu_t}$ is the change in money supply as a ratio of GDP, (seiniorage). The primary balance is defined as government revenue less government's non-interest expenses. That is, interest on debt is paid out of primary balance.

Debt is explosive if $\boldsymbol{\theta_t^* > 1}$. That is, if the real rate at which interest is paid on the public debt, given by $\boldsymbol{r_t^* \equiv \frac{1+i_t^*}{(1+\pi_t^*)} - 1}$, exceeds the real rate of growth of the economy, $\boldsymbol{g_t}$. (That is, the path taken by the evolution of debt is looked upon as unsustainable if $\boldsymbol{pb_t}$ and $\boldsymbol{\mu_t}$ are not unrealistically high). On the contrary, if $\boldsymbol{\theta_t^* < 1}$, then each subsequent year's debt falls below the preceding year's. And the burden of debt servicing reduces over time.

However, if $\boldsymbol{r_t^* > g_t}$, it may be possible to contain debt if the primary balance is positive and large enough (holding seigniorage constant). Thus, $\boldsymbol{pb_t}$ is a good indicator of government's efforts to contain debt (referred to as fiscal adjustment).

Croce and Ramon (2003) argue that were the economy in steady state, $\mathbf{r^* < g^*}$ would lead to a situation whereby government can issue debt and roll it over forever. This would be a Ponzi scheme that results in inefficient capital accumulation.

The framework in equation (1) enhances comparison of situations across countries and is also used by the Bretton Woods institutions for their own analyses and serves as a basis for policy advice. DSAs are central to accessing IMF financing and programmes.

Stress Tests

Evolution of debt according to equation (1) may be investigated for a country's vulnerability to economic and policy shocks. Starting from a base year's debt ratio, $\boldsymbol{d_0}$, historical averages of $\boldsymbol{i_t^*}$, $\boldsymbol{\pi_t^*}$, $\boldsymbol{g_t}$, $\boldsymbol{pb_t}$ and $\boldsymbol{\mu_t}$ are used to investigate how the debt ratio may evolve over the next 10 years or so. To be truly useful and forward looking, the variables driving the evolution of debt (base case) must be subject to stress tests since nobody knows what future will unfold. Note that calculation of $\boldsymbol{i_t^*}$ involve $\boldsymbol{i_t^h}$ and $\boldsymbol{i_t^f}$ so it is these two that are stressed. Also, calculation of $\boldsymbol{\pi_t^*}$ and involves $\boldsymbol{\pi_t^h}$ and $\boldsymbol{\pi_t^f}$, and it is these that are stressed.

Given that Ghana must have been conducting analyses of how her debt could possibly evolve and still be sustainable, such analyses should have been done under several scenarios of policy variables, macroeconomic variables and debt servicing costs. For example, historical averages of the variables for the years 2000 through 2009 could have been taken as the base case and the possible dynamics (evolution) of debt under several scenarios of effective GDP deflators, effective interest rates, rate of growth of the economy and other variables investigated for about 10 years. This should be repeated regularly, at least yearly. Typically, interest centres on exceptional but plausible negative scenarios of evolution of key variables. Up to three standard deviations of historical values of important variables are used. This is the subject matter of this study.

Ghana on Debt Restructuring Path

On December 4, 2022, the Ghana government announced a Debt Exchange Programme for holders of domestic bonds issued by the Government of Ghana

and two special purpose vehicles set up by the state (ESLA Plc and Daakye Trust Plc). The total value of domestic debt outstanding at the time was USD 13.7 billion (GHS 137.3 billion). The debt exchange agreement was concluded in February 2023. The new terms were that bonds that would have matured in 2023 will be exchanged for a staggered series of payments (combination of interest and principal) running from 2027 through 2033 both dates inclusive. Debts that would have matured after 2023 will be exchanged for a series of payment running from 2027 through 2038, both dates inclusive.

On December 19, 2022, the Ghana government announced that the sovereign had suspended payments on most of her external debt. As such, she will not service payments due on her Eurobonds, commercial loans and most bilateral loans until a new arrangement was put in place to exchange the old foreign debt for new foreign debt. She emphasized that this was an interim measure and that she was ready to "engage in discussions with all of its external creditors to make Ghana's debt sustainable".

Methodology

While Ghana government speaks freely of DSA, they do not provide the model that they use for their analysis. For this exercise, we use the *IMF-World Bank Debt Sustainability Framework For Low-Income Countries* discussed earlier.

As discussed, the evolution of debt in this framework is given by equation (1). The variables needed involve foreign nominal interest rate and inflation rate. This study uses US data for foreign country variables because more than 80% of Ghana's international trade is denominated in USD. The variables required for operationalizing the model are sourced as follows:

The study proceeds by first documenting Ghana's actual year-on-year values of $\boldsymbol{d_t}$. Then, actual values of $\boldsymbol{i_t^*}$, $\boldsymbol{\pi_t^*}$, $\boldsymbol{r_t^*}$, $\boldsymbol{g_t}$, and $\boldsymbol{\theta_t^*}$are calculated for each year from 2010 through 2021. Please see Table 1 for the definition and sources of variables. Next, the means of annual values $\boldsymbol{i^*}$, $\boldsymbol{\pi^*}$, $\boldsymbol{r^*}$, $\boldsymbol{g^*}$, and $\boldsymbol{\theta^*}$ for the period 2000 through 2009 were calculated together with their standard errors. Following this, the path that Ghana's debt would have evolved between 2010 and 2021 had the dynamics followed the means of the values just calculated was estimated. Finally, these baseline estimates were stress tested assuming worsening of the variables by one, two and three standard errors. That is, under mild, moderate and extreme but plausible shocks respectively.

Table 1. *Definition and Sources of Variables Used in DSA.* ***t*** *is Year*

Variable	Definition	Source
$\boldsymbol{d_t}$	Debt stock as a proportion of GDP in year ***t***	World Bank https://data.worldbank.org/country/GH
$\boldsymbol{\theta_t^*}$	See equation (2)	Calculated according to equation (2)
$\mathbf{g_t}$	Real rate of growth of GDP, constant 2015 prices	World Bank https://data.worldbank.org/country/GH
$\boldsymbol{\alpha}$	Foreign debt to GDP ratio	Republic of Ghana (2021). Annual Public Debt Report for 2021

i_t^*	Effective nominal interest rate	Calculated according to equation (3)
π_t^*	Effective GDP deflator	Calculated according to equation (4)
i_t^h	Domestic inflation rate	World Bank https://data.worldbank.org/country/GH
i_t^f	US inflation rate	World Bank https://data.worldbank.org/country/GH
ε_t	depreciation/appreciation rate of the domestic currency	World Bank https://data.worldbank.org/country/GH
β	is the output share of tradables in total GDP	World Bank https://data.worldbank.org/country/GH
GDP_t	Gross Domestic Product	Ghana Statistical Service Bulletin, various years
pb_t	primary balance to GDP ratio	World Bank https://data.worldbank.org/country/GH
μ_t	change in money supply as a ratio of GDP	Set equal to zero

Source: Author's compilation.

Results and Discussion

Column (2) of Table 2 presents Ghana's actual end of year public debt to GDP ratio from 2009 through 2021. This ratio increased steadily from 35% to 80.1% over the period. By the end of 2021, Ghana had become debt distressed and could not borrow form the international capital markets anymore. This set in motion the chain of activities that are the subject matter of this paper and which are still unfolding.

Also, indicated in Table 2 are calculated annual values of i_t^*, π_t^*, r_t^*, g_t, θ_t^* and pb_t. It is noted that, for the period in question, other than 2010, 2011 and 2021, the effective real rate at which Ghana paid interest on her debt, r_t^*, exceeded the real rate at which her economy grew, g_t. In such a situation, the debt ratio would grow unless moderated by the primary balance. Unfortunately, Ghana's primary balance ratio was negative in seven out of the 12 years. Even when the primary balances were positive, they were small, resulting in a negative 12-year average. The results are what we see in column (2) of Table 2, rising debt ratio year-after-year. Thus, pb_t was no help in lowering the path of Ghana's debt.

μ_t has been set equal to zero, mainly because information on seiniorage is not readily available. However, we take consolation in the fact that Arisen and Veiga (2005) have noted that countries that develop their institutions to be conducive to greater economic freedom show lower reliance on seigniorage financing of public deficits. Ghana has whole heartedly adopted the principle of economic freedom.

Table 2. *Empirical Evolution of Ghana's Debt to GDP Ratio, and Key Variables of her Debt Dynamics. Column (9) is Baseline Estimates of the Evolution Using Historical Averages*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Year	dt	i_t^*	π_t^*	r_t^*	g_t	θ_t^*	pb_t	d_t
2009	35.0%							35.0%
2010	37.5%	14.5%	11.7%	2.5%	7.9%	0.950	0.10%	35.6%
2011	42.6%	11.0%	8.0%	2.8%	14.0%	0.902	2.00%	36.2%
2012	47.8%	16.4%	5.3%	10.5%	9.3%	1.011	-1.60%	36.8%
2013	42.9%	20.4%	10.1%	9.4%	7.3%	1.019	-0.20%	37.4%
2014	51.2%	19.3%	13.1%	5.4%	2.9%	1.025	-2.90%	38.1%
2015	55.6%	20.1%	6.5%	12.8%	2.1%	1.104	-0.30%	38.8%
2016	56.9%	22.7%	10.7%	10.8%	3.4%	1.072	-1.10%	39.4%
2017	55.6%	16.0%	6.8%	8.7%	8.1%	1.005	0.50%	40.1%
2018	57.6%	16.6%	7.4%	8.6%	6.2%	1.022	1.40%	40.8%
2019	62.4%	15.9%	5.0%	10.4%	6.5%	1.037	0.80%	41.6%
2020	76.1%	16.7%	7.4%	8.6%	0.5%	1.081	-8.00%	42.3%
2021	80.1%	13.9%	9.0%	4.5%	5.4%	0.992	-4.10%	43.1%
Average		**17.0%**	**8.4%**	**7.9%**	**6.1%**	**1.018**	**-1.12%**	

Source: i_t^*, π_t^*, r_t^*, and θ_t^* calculated from equations (1), (2), (3) and (4) by author.

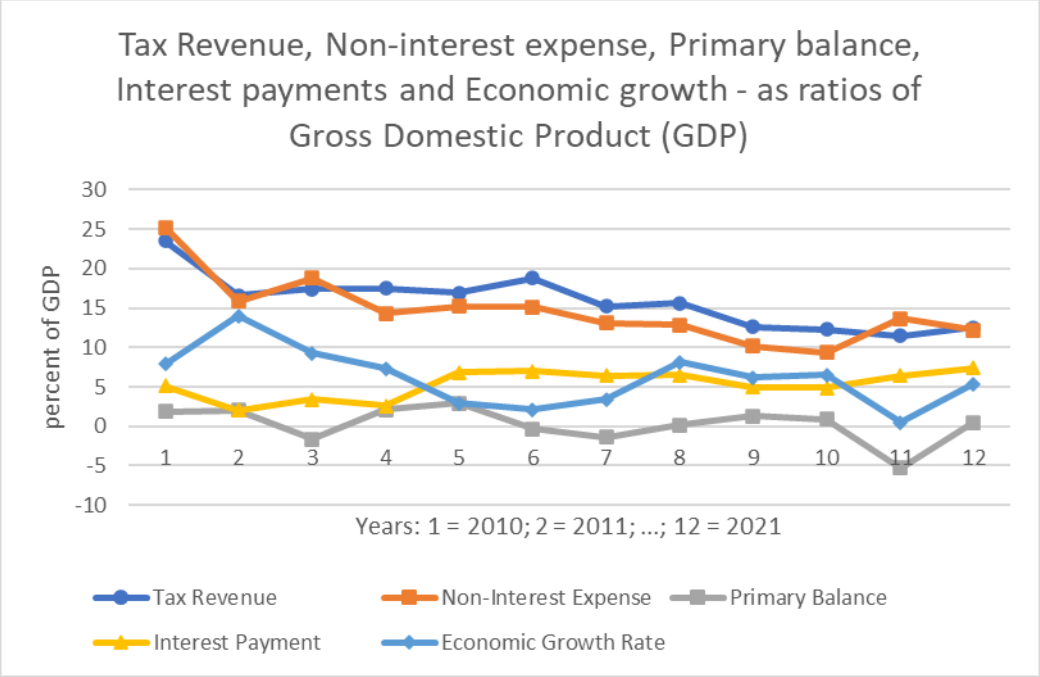
Column (9) of Table 2 presents the baseline scenario of the evolution of Ghana's debt using 2000 to 2009 averages of i^* = 19.10%; π^*= 10.45%; r^*= 7.83%; g = 5.36%; θ^*= 1.023; and pb = +0.23%.

Had the averages of the variables for 2000 to 2009 prevailed during 2009 to 2021, the debt ratio would have risen from 35% in 2009 to only 43% at the end of 2021. A rather beautiful picture. Once again, μ_t has been set equal to zero. This is repeated for all stress testing scenarios.

History indeed counts for something. The 2000 to 2009 period included three years during which Ghana was under the *Highly Indebted Poor Country Initiative* (2002-2004). Under this initiative, Ghana received comprehensive debt reduction with net present value USD 2.186 billion, 56% of Ghana's total debt outstanding.[3] Obviously, this influenced Ghana's historical actual i^*; π^*; r^*; g; θ^*; and pb. Thus, consistent with theory, staying with historical actuals only would not be good enough.

[3] http://www.imf.org/external/np/hipc/index.asp

Figure 1. *Trends in Tax Revenue, Non-interest Expense, Primary Balance, Interest Payments and Economic Growth Rate*



Source: Drawn from data compiled from Ghana's annual *Budget Statements.*

Figure 1is a pictorial presentation of fluctuations in key ratios. It shows that tax revenue and non-interest expense generally trended downwards between 2010 and 2021. While Non-oil expenses were below tax revenues much of the time, they exceeded tax revenues in 2010, 2012 and 2020. The primary balance hovered around zero. It was positive in five years and negative the other seven years. Interest expenses were positive all through and were generally rising. The interest expense graph was higher than the primary balance graph all through. Thus, Ghana ran an overall deficit all through the period. The real growth rate of GDP was positive (almost zero in 2020) all through but fluctuated from year-to-year.

Primary Balance

Interest in the primary balance led this author to compare the mean primary balances for the 2000-2009 period and 2010-2021 period. The mean for 2000-2009 was 0.23% of GDP and -1.12% for the 2010-2021 period. A statistical test of differences in the two means says -1.12% is statistically smaller than 0.23% at the 95% confidence interval. Here then is what is driving post 2009 debt dynamics - the average primary balance ratio for the 2010 to 2021 period is statistically smaller than the average of the earlier period. That is, public expenditure ratios were relatively higher during the 2010-2021 period than during the 2000-2009 period.

However, another test revealed no statistical difference between the mean real borrowing rate of 7.9% and the mean real growth rate of GDP of 6.1%, both for the 2010-2021 period. With r^* not statistically different from g^*, the path followed

by Ghana's debt over the 2010-2021 period depended critically on ***pb***, which was near zero and negative on average.

Debt stabilizing primary balance

For debt-stabilizing ***pb*** analysis, we turn to a statement in Ghana's 2019 budget statement. In there one reads

> Paragraph 346:
> *Mr. Speaker, one of the main goals of the [16th] IMF Extended Credit Facility (ECF) was to implement fiscal consolidation to restore debt sustainability and macroeconomic stability. This goal has been achieved with great success. To ensure* ***irreversibility*** *[emphasis added], government is committed to maintain debt sustainability to achieve the "Ghana Beyond Aid Agenda". In 2019, strategies including capping non-concessional borrowing at US$750.00 million will be enforced to achieve a* ***nominal debt to GDP ratio of not more than 60 percent*** *[emphasis added].*

So, the question now is, what primary balance would have ensured that Ghana's debt ratio was stabilized at the intended 60%? The 2019 budget was read in November 2018 to be effective January 1, 2019. In 2018, r^* was 8.6%, g^* was 6.2% and d_{t-1} = 57.6%. Based on equation (1), and assuming a preferred stable debt ratio of 60% implied in the 2019 Budget Statement, the debt stabilizing primary balance works out to 1.4%.

This was the ***pb*** for 2018. Of course, Ghana's debt did not stabilize, but exploded. In 2019, the ***pb*** was 0.8% and the debt ratio moved up to 62.4%. In 2020, ***pb*** was -8% and the debt ratio exploded to 76.1%.

For the period 2008-2012, Ncube and Brixiová (2014) observed that high growth rate of economies and negative real interest rates contributed to decline in debt burden among 29 African countries. In this study, the actual primary balance is less than debt stabilizing primary balance (Table 2) that was responsible for the rising debt ratio. UNECA (2019) has argued that given that most African governments' revenues (Ghana inclusive) are in the range of 12% - 20% of GDP, these countries must increase revenues through tax reforms, non-tax revenue, enhanced tax administration, reduced tax evasion and reduced tax avoidance especially in the natural resources sector. In fact, they added that raising government revenues to 20% will lift 16 African countries out of the debt trap.

Stress Tests

In 2010 for example, managers of the Ghanaian economy would have been happy with the debt path revealed by the base scenario, (last column of Table 2). In fact, a scenario that shows these very gentle increases in the debt ratio may have translated to some implied incentive to borrow more. What about stressed scenarios?

Theory says that in conducting stress tests, many scenarios should be considered including extreme but plausible cases. Up to three standard errors off the mean baseline values are typically used. Here we present scenarios of mild, moderate and extreme but plausible scenarios, respectively, one, two and three standard errors or worsening base values of i^*, π^*, r^*, g, θ^* and pb.

The variables driving i^*, are i_{us}, i_{gh}, α and ε. Please refer to equation (3). The variables driving π^*, are π_{us}, π_{gh}, β and ε. Please refer to equation (4). $r^*$is calculated from i^*, and π^*; and $\theta^*$is calculated from r^* and g. Thus, we proceed with scenarios in which i_{us}, i_{gh}, π_{us}, π_{gh}, and β deteriorate by one, two and three standard errors of their 2000 to 20009 means.

Table 4 presents the results. Column (3) headed *"1 SE worse",* means key variables are one standard error worse than the 2000 to 2009 average. That is, r^*=8.75%; g = 4.86%; θ^* = 1.037; pb = -0.83%; β = 45.94%. Table 4 says, if all key variables deteriorate by one standard error, the debt ratio shoots up from the baseline projection of 43% in 2021 to 67% that year. The reason is that θ^***would** have increased from 1.023 to 1.037 and pb deteriorated from 0.23% to -0.83%. Note that, 67% debt ratio is higher than the 55% threshold recommended by IMF Guidelines for economies judged to have *medium* debt carrying capacity.

Table 4. *Debt to GDP Dynamics under Worsening of Key Variables*

Year	Base Case	1 SE worse	2 SE worse	3 SE worse
2009	35.0%	35.0%	35.0%	35.0%
2010	35.6%	37.1%	38.6%	41.8%
2011	36.2%	39.3%	42.0%	49.3%
2012	36.8%	41.6%	45.7%	57.7%
2013	37.4%	44.0%	49.4%	66.9%
2014	38.1%	46.5%	53.4%	77.2%
2015	38.7%	49.0%	57.4%	88.6%
2016	39.4%	51.7%	61.7%	101.3%
2017	40.1%	54.4%	66.1%	115.3%
2018	40.8%	57.3%	70.7%	130.9%
2019	41.5%	60.2%	75.5%	148.1%
2020	42.3%	63.3%	80.5%	167.3%
2021	43.0%	66.5%	85.7%	188.5%

Legend: "1 SE worse" is one standard error worse; "2 SE worse" is two standard errors; and "3 SE worse" is three standard errors.
Source: Author's calculations.

Column (4) of Table 4, headed *2 SE worse,* means key variables are two standard errors worse than the 2000 to 2010 average. That is, r^* =9.34%; g = 4.37%; θ^* = 1.047; pb =-1.90%; β = 43.07%. Table 4 says, if all key variables deteriorate by two standard errors, the debt ratio shoots up from the baseline figure of 43% in 2021 to 85.7%. The reason is that θ^* has increased from 1.023 to 1.047 and pb has deteriorated from 0.23% to -1.90%. The projected debt ratios under this scenario are higher than the actuals in Table 2 and would have caused Ghana more headaches than she is now suffering. Stress results of this scenario should have made the economic managers scratch their heads. They should then have developed contingency plans. It would appear they did not.

Column (5) of Table 4, headed *3 SE worse,* means key variables are three standard errors worse than the 2000 to 2009 average. That is, r^* =15.219%; g = 3.87%; θ^*= 1.109; pb =-2.96%; β = 40.21%. Unfolding of this scenario would have been disastrous for a lower middle-income country like Ghana. In fact, long before reaching a debt to GDP ratio of 188% projected in Table 4 for 2021, no external economic agent would have been willing to lend to Ghana. The domestic currency would have collapsed to the point where, on purchasing power parity basis, Ghana would have lost her lower middle-income status and returned to being a low-income country. In fact, Table 4 says the 2021 debt ratio at which the wheels fell off Ghana's economy at 80% of GDP was reached soon after 2014, seven years earlier under this scenario.

Conclusion and Recommendations

The obvious matter here is that Ghana should have undertaken stress tests of the base scenario of the path of her debt stock for up to 10 years. Mild, moderate, extreme but plausible scenarios should have been considered. Results of these tests should have informed drawing up of credible contingency plans in the face of unfolding events/variables. A developing economy must undertake stress tests of plans she formulates.

Clearly, fiscal adjustments (improving primary balance) and undertaking investments that enhance economic growth above the effective real rate at which she pays interest on debt contracted would have helped. Unfortunately, the fruits of growth-enhancing investments take time to become evident, but they are necessary.

Fiscal adjustments involve reduction in government expenditure, increasing government revenues or both. The former is not politically palatable. The latter involves hard work. Interestingly, contained in Ghana's 17th Programme with the IMF (2023) is a condition that Ghana must increase her primary balance to +1.5% of GDP from 2025 through 2028.

Equation (1) recognises the role of monetary policy. This has been downplayed here because of lack of objective data and its potential to be inflationary, as Adenutsi (2008) cautioned the Ghanaian authorities.

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Appendix A

Indication that Ghana Has Been Aware of the Need for her Debt to be Sustainable

2018 Budget Statement
Paragraph 204:
Mr. Speaker, attaining debt sustainability is one of the key objectives of Ghana's debt management policy. The latest DSA reveals a declining public debt to GDP trajectory based on the positive developments in the primary balance.

Paragraph 346:
In 2018, the Ministry will continue to carry out its mandate of managing public debt to achieve sustainability and ensure that government funding requirement is raised at least cost at a prudent level of risk. In addition, it will conduct and publish a revised Debt Sustainability Analysis (DSA) and Medium-Term Debt Strategy (MTDS) to guide borrowing.[4]

2019 Budget Statement, Paragraph 346:
Mr. Speaker, one of the main goals of the [16th] IMF Extended Credit Facility (ECF) was to implement fiscal consolidation to restore debt sustainability and macroeconomic stability. This goal has been achieved with great success. To ensure irreversibility, government is committed to maintain debt sustainability to achieve the Ghana Beyond Aid agenda. In 2019, strategies including capping non-concessional borrowing at US$750.00 million will be enforced to achieve a nominal debt to GDP ratio of not more than 60 percent.[5]

2020 Budget Statement, Paragraph160:
Government is committed to maintaining the public debt at sustainable levels below the established threshold of 65 percent of GDP in line with Ghana's ranking as a moderate performer under the new Debt Sustainability Framework.

2021 Budget Statement
Paragraph 171:
COVID-19 aggravated the situation in 2020 and, together with the Financial Sector Bailout and the Energy Sector IPP payments, resulted in the debt-to-GDP ratio exceeding the ECOWAS threshold of 70 percent at the end of the year.

Paragraph 239:
The medium-term fiscal framework will be anchored on debt sustainability given the exigencies of the time, the elevated debt levels, as well as the limited fiscal space and budget rigidities.

[4]Note that, when the 2018 Budget Statement was being read in November 2017, Ghana was firmly into her 16th Program with the IMF.
[5]In spite of promised limit of US$ 750 million of non-concessional loans in 2019, in March 2019, Ghana issued three loans to raise a total of US$ 3 billion! One wonders what happened! It is noted that in March 2019, Ghana was on the verge of exiting her 16th tutelage

Paragraph 242:
Our resolve to ensure debt sustainability in the medium-term will support a medium-term fiscal path that will ensure a return to the Fiscal Responsibility ACT threshold of a deficit of 5 percent of GDP and a positive primary balance by 2024.

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The Relationship between Intellectual Capital and Innovations

By Fabio Ivinić[*], Sebastian Zemla[±] & Nataniel Zemla[°]

This study explores the relationship and importance of intellectual capital and innovation in creating additional value for entities. In today's world, where we live and create in a so-called "knowledge society," innovation plays a significant role in the value chain, while intellectual capital is a crucial element and generator for the overall development of entities and vice versa. Thus, they represent a significant part of a company's development, performance, wealth, and competitiveness. Furthermore, through the empirical analysis, the study provides evidence that a high level of intellectual capital in its three dimensions supports and enhances a company's ability to innovate and generate new ideas and insights. In this respect, it is more than justified to link intellectual capital, comprising human, relational, and structural capital, to value creation and innovation. The investigation will conclude with an examination of the topic in the context of contemporary society, particularly in light of (inter)national crises, whether economic, health-related, or other crises caused by conflicts.

Keywords: *assets, development, innovations, intellectual capital (IC), IC in times of crisis, value creation*

Introduction

Topical Introduction

In today's knowledge society, characterized by rapidly changing market demands and constant challenges, intellectual capital and innovation are widely recognized as key drivers and supporters of development and wealth creation for entities. Furthermore, consistent with Andrikopoulos et al. (2009) and Ivinić (2022), in knowledge-based economies, value creation primarily stems from intangible resources such as knowledge (i.e., intellectual capital and innovation as part of its outcome), far more than from traditional sources of value creation like financial and physical capital. Moreover, Mutiasari and Rizki (2020) assert that intellectual capital is an intangible asset crucial for the prospect of future wealth creation for entities. Consequently, it can be assumed that intellectual capital and innovation enable entities to adapt more swiftly and efficiently to challenging market demands and to maintain competitiveness through additional comparative advantages.

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According to Forbes (2016), innovation can be seen as a dualistic dimension where, on one hand, it is an outcome of a recognized need (or from the economic point of view, a recognition of new market product potentials). On the other hand, it requires the involvement of technical knowledge and expertise, new scientific research and activities to achieve desired findings and outcomes. Consequently, it can be concluded that intellectual capital in its three-dimensional aspect[1] is a generator and supporter of the process and outcomes of innovation, while their mutual relationship is linked to competitiveness, comparative advantages, development, and wealth creation for business entities. Finally, when referring to innovations and intellectual capital and their reciprocal impacts on entities' performances, it is of high interest and more than justified to investigate the topic in-depth and gain a broader understanding of their relationships, impacts, and outcomes on business entities. Thus, the study presents Chapter Two, where a deeper insight into the topics of intellectual capital and innovations is presented and analyzed, while Chapter Three examines their relationship and impacts on business entities' performances. Chapter Four addresses the topic in the context of current developments.

Research Question, Objectives and Hypotheses Explication

According to Pece et al. (2015), innovations promote progress, growth, and competitiveness for business entities. Given that innovations are a key to development (referred to by the authors as the "engine of development") and intellectual capital is a supporter of the development of innovations, the central research question is: Is there a relationship between intellectual capital and innovations? In addition, some additional questions that this study will explore include:

- What is the nexus between innovations and intellectual capital relationships?
- What is the effect of intellectual capital and innovations on business entities performances?
- What does the intellectual capital structure looks like and how is it composed?
- In what way does the intellectual capital structure support the development of innovations?
- How should intellectual capital be classified in current times of crisis?

Consequently, despite attempting to find answers to the above questions, the main objective of this study is to gain a broader knowledge of the relationships and impacts of innovation and intellectual capital on the performance of companies, and to find answers regarding the mutual relationships between innovation and intellectual capital. Finally, the study proposes two main hypotheses that are either accepted or rejected based on the empirical study and the qualitative method used.

H1: There is a relationship between intellectual capital and innovations.

[1]**The three-dimensional aspect refers to the** main **components** of Intellectual Capital: Human Capital, Structural Capital, and Relational Capital. **A** further analysis of the **three-dimensional** aspect of Intellectual Capital is available in **Part** 2.1 **of** this study.

H2: There is a positive impact of the relationship between intellectual capital and innovation on business entities' performances.

Theoretical Background and Methodology

By analyzing the literature, it can be deduced that there are few studies and little research concerning the direct relationship between intellectual capital and innovation. However, a good insight into the relationship between innovation and intellectual capital can be derived from the study by Hejazi et al. (2018), where the authors analyze the role of intellectual capital in the creation of innovations, using the example of HIS[2] and computer units.

What can be observed is that there are many separate studies about intellectual capital and innovation. Therefore, there is a lot of interest in and studies on the impact of innovation on business performance and growth, while there is some research that attempts to describe its nature. Consequently, a comprehensive insight into the topic of innovation and an excellent review of the development of the literature concerning the topic can be found in the study by Pece et al. (2015), entitled: "*Innovation and Economic growth: An Empirical Analysis for CEE[3] Countries*". According to the authors, the origins of the concept of innovation and economic growth can be linked to Solow as early as 1957 (Solow 1957). Further, according to Aghion et al. (2009) and Pece et al. (2015), when discussing economic growth and innovation, one of the most notable economists who discussed innovation is Joseph Schumpeter. He pointed out that initially, there should be a clear distinction between economic development and economic growth (Schumpeter 1939). Finally, according to him, economic growth indicates a gradual but slow change of the entire economic system, while economic development arises from changes driven by innovation, where the economic system can be considered a supporter of that process. Additionally, he stated that education is one of the most important factors responsible for innovation, which subsequently drives competitiveness.

There are several studies that should be highlighted, which link innovation with economic growth and development, starting with Ulku in 2004, whose research examines economic growth and innovation across 20 OECD and 10 non-OECD countries, followed by Pessoa (2010), who conducted research on the costs of R&D and their relationship to economic growth and innovation. And while Ramadani et al. (2013) conducted an investigation into the impacts of innovation on development, Czarnitzki and Toivanen (2013) focused their study on the relationship between economic growth and research and development investments in two developed European countries. In addition, the study by Norris et al. (2010) should be mentioned, which examined the impact of innovation on financial performance within the manufacturing industry, while Jin et al. (2019) conducted a study about the effects of innovation capability on business performance. When referring to intellectual capital, the literature mainly attempts to define its term, while literature about its impact on business performance is very limited. According to Andrikopoulos and Kaimenakis (2009), intellectual capital as a company's hidden value was first detected in the early

[2]Health information system.
[3]Central and Eastern Europe.

1980s. Thus, the pioneering theoretical studies that increased scientific interest in the subject, and contributed to creating the theoretical framework of intellectual capital, are: "*Mobilizing Invisible Assets*" by Itami (1987), "*The Invisible Balance Sheet*" by Sveiby (1989) and Stewart (1997) with "*Intellectual Capital: The New Wealth of Organizations*". Additionally, some authors worth emphasizing when analyzing and discussing intellectual capital are Obeidat et al. (2016), Černe (2011), Pratama (2020), Abbas (2015), Abdulaali (2018), Kianto (2017), Moro-Visconti (2020) and Alkhateeb et al. (2018).

To present all the aspects of innovation and intellectual capital, and their relationship, the study will be mostly based on a qualitative empirical study involving literature analyses. This also includes analyses with descriptions and conceptualizations.

Intellectual Capital and Innovations

Intellectual Capital

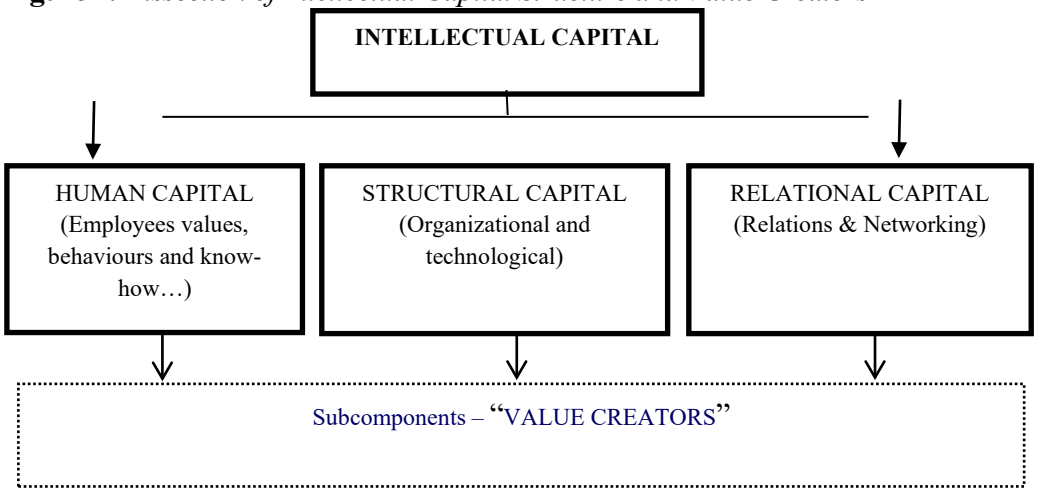
Despite a strong interest in the topic and concept of intellectual capital within the literature, there is still not a generally accepted definition of the term. However, the main structural differentiation of the concept is widely defined. For this reason, this study will draw on the literature and explanations of various notable authors by focusing on all the common elements associated with the term 'intellectual capital'. Additionally, most definitions of intellectual capital explain it as a meta-level concept of knowledge and actions that results in competitiveness, development and value creation for entities. According to many authors such as Feiwel (1975), Chang and Hsieh (2011), Černe (2011), and Ivinić (2022), intellectual capital is not a value per se, and it means more than exclusively "*pure intellect*", therefore it can be considered as a degree and a process of "*intellectual actions*" moving from having certain knowledge and skills to using it and converting it into new value-added products or services. Alkhateeb et al. (2018) state that it can be considered as one of the most influential factors that significantly affects development and organizational performance in today's business environment. Further, according to Kym and Moon (2021), intellectual capital is the most significant resource possessed by the entity that is responsible for competitiveness and comparative advantages.

Many authors such as Khan (2014), Sardo and Serrasqueiro (2017), Abdulaali (2018) and Kym and Moon (2021) consider that intellectual capital represents an intangible asset within an organization that "delivers" new concepts, enhances competitiveness and assists in the creation of future benefits and wealth for a business entity. Additionally, many authors describe intellectual capital as a strategic asset that delivers growth and sustainability for the organization in a competitive market. Thus, intellectual capital is a hidden part of a company asset whose value varies over time and has a structure whose components differ among industries. However, it is a company's valuable resource that needs to be detected, well managed, defined and structured in order to gain comparative advantages and high efficiency (Ivinić 2022). Some other definitions concerning intellectual capital that we would like to highlight to create a framework for linking innovation and intellectual capital are the following.

According to Choong (2008), intellectual capital is a holistic or "*meta-level*" ability of a company to regroup, prepare and coordinate knowledge and, according to Sullivan (1999), to convert it into profit. Or, as Roos et al. (1997) illustrated, intellectual capital is a package of functional knowledge that, through practical application, has an impact on company performances and results. Furthermore, one of the most indicative and illustrative definitions in the context of intellectual capital is the one by Edvinsson and Malone (1997), stating that "intangible assets are those that have no physical existence but are still of value to the company." Moreover, one of the easiest ways to present an intellectual capital concept is through a metaphorical depiction of a tree whose life and fruits rely on invisible and hidden roots (Arenas and Lavanderos 2008). Consequently, the roots represent the potential for future earnings while the fruits are new ideas and additional values.

Finally, the scope of the aforementioned definitions about intellectual capital is to find the nexus and patterns that can be related to innovation. Another step in linking the terms intellectual capital and innovation is analyzing the structure of intellectual capital. Consequently, Figure 1 presents the structural differentiation of the term. According to several authors (i.e., Sundač and Švast 2016), innovations are one of the fundamental parts and a subcomponent of the main intellectual capital component Human Capital, which plays one of the most important roles in the creation of innovations.

Figure 1. *Dissection of Intellectual Capital Structure and Value Creators*



Source: Graphical presentation of intellectual capital components, extended for the subcomponents area, according to Ivinić (2022).

The intellectual capital structural breakdown is presented in Figure 1. Based on the literature studied, intellectual capital consists of three main components: Human Capital, Structural Capital, and Relational Capital. Further, each of these components is composed of their corresponding value creators, i.e., subcomponents.

Innovations

What constitutes innovation, what all types of innovation are and what impact innovation has on the economy and its growth are some of the main questions this study seeks to answer.

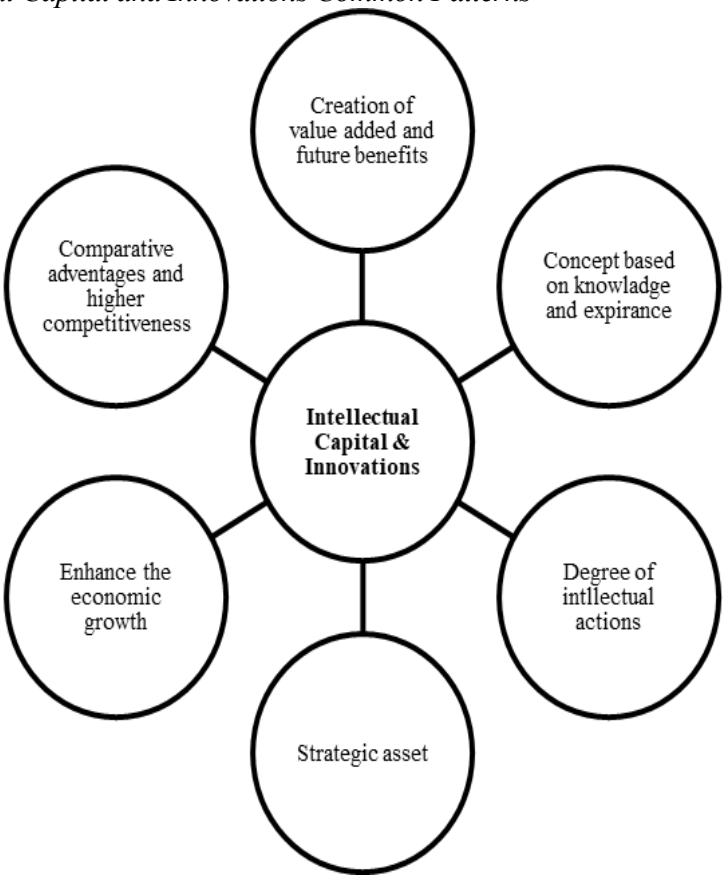
According to many macroeconomists and the definition of the European Central Bank (2017), innovations are vital drivers of economic progress and growth that benefit consumers, industries, and the entire economy. Further, innovations in economic terms are defined as the application and development of new ideas and technologies that improve services or goods or lead to their more efficient production. In the end, innovations contribute to economic growth and profitability. Furthermore, as early as the 1950s, according to Abramovitz (1956) from the Stanford University and Prof. Rosenberg (2004), there are only two ways of increasing output: 1) by increasing the amount of input that is used in the production process, or 2) by being smart and finding new and more efficient ways of production, where the input remains the same or decreases while the output increases.

According to Sarangi et al. (2021) and their research analysis concerning the relationship between innovations and economic growth in the G20 countries in the period from 1691 - to 2019, the long-term economic growth is highly influenced by innovations. Furthermore, innovations play an important role for business entities in remaining competitive in the market (Pradhan et al. 2016) and gaining additional and higher comparative advantages. Additionally, according to the calculations from the U.S. Chamber of Commerce Foundation (2015), in 2015 roughly 50% of the US annual GDP growth could be linked to increases in innovation. According to many authors, the clear and appropriate question is whether innovation drives economic growth or vice versa, where economic growth is responsible for the dynamics of innovations. The relationship flows both ways and according to Maradana et al. (2017), both answers can be well-supported by different theoretical arguments. Further, innovations can be of great help for adapting faster to social and economic changes and remain competitive. Innovations are not exclusively related to economic growth, but they can be linked with many other socio-economic improvements such as helping in the reduction of poverty, better education and health systems, better and more efficient infrastructure, etc.

Relationship and Impact between Intellectual Capital and Innovations

Based on the literature analyzed and everything sketched so far in this study, it is likely to conclude that there is a positive relationship between intellectual capital and innovations. According to several authors (i.e., Geissdoerfer et al. 2018, Rosenberg 2004, Uppenberg 2009, Sarangi et al. 2021), the discovery of new technology occurs thanks to innovations which create products, processes and systems that improve productivity and efficiency within the economy, creating new income channels and new values. Further, the study offers Figures 2, 3 and 4 with the scope of offering an efficient visualization and analysis of the relationship between intellectual capital and innovations.

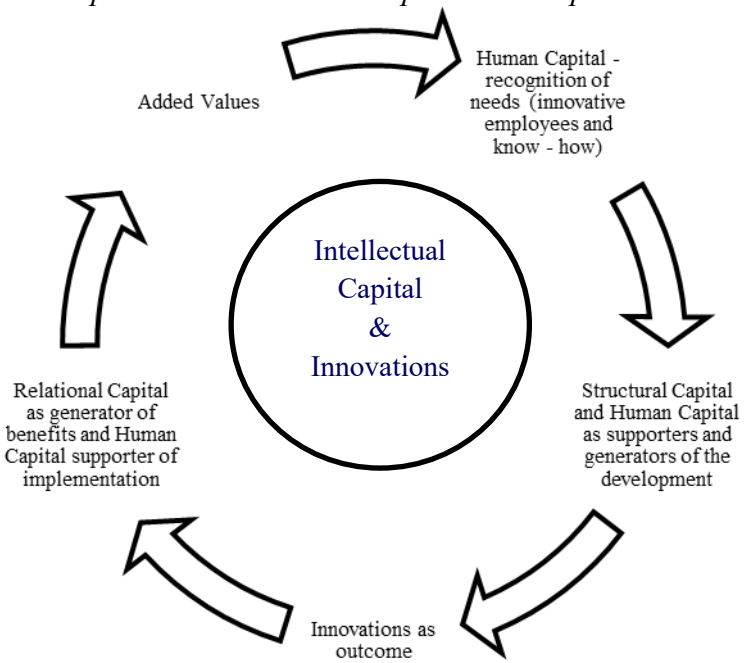
Figure 2. *Intellectual Capital and Innovations Common Patterns*



Source: Authors graphical presentation of some intellectual capital and innovations common patterns.

In Figure 2, the authors intend to highlight some patterns which can be related to the terms of intellectual capital and innovations. The aim is to provide a basis and framework for a better analysis of the study and to see whether the two terms can be linked or not. The conclusion is that intellectual capital and innovations have some of the main characteristics in common. Consequently, on the basis of the analyzed literature, the similarities between the two terms turn out to be the strongest: they are strategic assets, they are a product of intellectual activities, they are based on knowledge and experience, and they are seen as supporters of economic growth, enhancing comparative advantages and competitiveness - they are "creators" of future values.

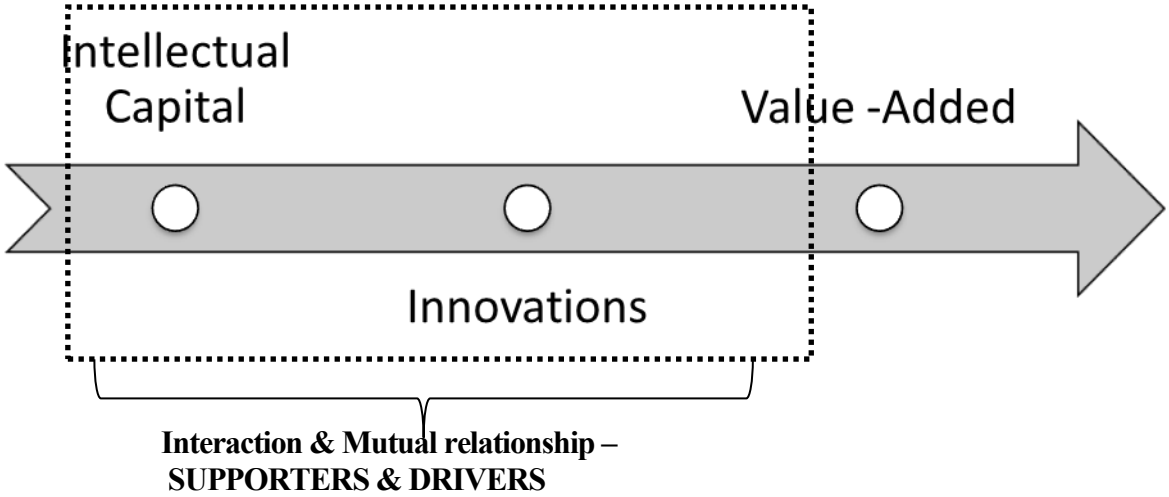
Figure 3. *Intellectual Capital and Innovations Reciprocal Development Process*



Source: Authors graphical presentation of intellectual capital and innovations reciprocal development process.

Figure 3 represents the intellectual capital and innovations process development. Consequently, based on the figure it is possible to conclude that there is a positive and reciprocal relationship between all intellectual capital components and innovations. Therefore, it is possible to state that innovations and all the innovation processes begin from human capital as one of the three main components of intellectual capital. Human capital is the only one responsible for creating innovations and recognizing a need for innovations. Further, the creation and the development process of innovation is highly supported by another component of intellectual capital - i.e., Structural Capital. Finally, innovation as an outcome has to be monetized and efficiently distributed, all in line with the strategy of a business entity. This role is intended for relational capital as the final, third component of intellectual capital. Consequently, the relational and human capital are responsible for all the value-added that a generated innovation can produce. Finally, all the components of intellectual capital play an important role in the creation, development, implementation and management of innovations. Consequently, it is possible to conclude that the relationship between intellectual capital and innovation flows in both directions.

Figure 4. *Intellectual Capital, Innovations and Value – Added Relationship and Interaction Line*



Source: Authors graphical presentation of intellectual capital, innovations and value-added interaction.

The presented Figure 4 represents the relationship and interaction line between intellectual capital, innovations and value-added. Consequently, intellectual capital and innovations have a mutually positive relationship that flows in both directions, where they are both supporters and generators of new and additional values. Within the figure, intellectual capital appears as first in the chain of value creations due to the simple fact that the first one recognizing a need for innovations is, as previously mentioned, human capital. However, once the need for innovation is recognized, the relationship and interaction between intellectual capital in its full form (with all the items and value creators) and innovations flows in both directions, intending to achieve new values.

Classification of the Topic at the Current Times

If you look at the current situation in the world economy, the situation of global companies and the world markets, their problems and challenges are raised almost in the same breath. Topics such as delivery bottlenecks due to the corona pandemic or escalating energy costs due to the war in Ukraine continue to play a central role in the current media landscape (Allam et al. 2022, p. 1). But what is also at the center of media attention is the struggle for human capital. Although this is articulated more independently of crises due to its characteristics, it has intensified again as a result of the crises mentioned. It is the competition for the most suitable personnel, the search for adequate employees or summarized under the heading widespread shortage of skilled workers (compare e.g., PwC's global survey on "Hopes and Fears 2022").

In Germany, the economic heavyweight of the European Union, this topic is even stated as "*one of the major challenges of the coming decades for all actors from politics, business and science*". This elementary classification was not carried out without reason, because "*skilled workers ensure innovation and competitiveness, growth and employment, prosperity and quality of life*" according to the Federal

Ministry of Economics and Climate Protection (Federal Ministry for Economic Affairs and Climate Action 2022). For Birri, the status of the staff has even undergone a reciprocal development, which has blossomed from being a cost block to becoming such an important component of a company valuation. Human capital has thus experienced a new perspective in recent years, which, in addition to being classified as an economic variable, also acts as a driving factor for innovations and corporate developments. While in the past the focus was on the amount of the associated expenses within the personnel factor and a limit on wages and salaries as well as an optimization of the number of jobs was aimed at, the new perspective is associated with the quality, the risks and the care of human capital, which should lead to better returns and productivity. Especially in the context of the market value formation of a company, this topic is becoming more and more of a defining component, where the material values of a balance sheet have to give way more and more. This means that intangible assets are not only on the rise, they are now an integral part of a company valuation (Birri 2011, p. 25).

The central role of intellectual capital as a driver for innovations and future developments is increasingly evident. As early as 2010, Sprenger highlighted that "*the competition of the future will be decided on the personnel markets*", a trend that has since accelerated significantly (Sprenger 2010). In Germany, only 16% of companies identified a shortage of skilled workers as a business risk then. Today, this issue has become the primary obstacle to development for companies. Understanding the importance of human capital, encompassed within the broader term intellectual capital, requires an examination of the cause behind the current skilled labor shortage. As part of the demographic change, the aging of society intensifies the bottlenecks in the skilled labor sector. Based on initial projections in the strongest economy in the EU, the working-age population (people between the ages of 20 and under 65) will decrease by 3.9 million to 45.9 million by 2030. The extrapolation to the year 2060 even predicts a decline of 10.2 million people of working age (Federal Ministry for Economic Affairs and Climate Action 2022). These first numerical statements only give an idea of the challenges companies will face in the medium and long term. Sprenger's insights have proven prescient, and the “War for Talent” coined by McKinsey aptly captures the current competitive landscape (Axelrod et al. 2001). The trend of downsizing during economic crises is now an illusion, as the competition for top talents remains fierce even during downturns. This was evident during the Great Recession when a PwC survey revealed that over 50% of CEOs considered the availability of skilled workers a major challenge (PwC 2010). Given these trends, it is clear that intellectual capital is not only a critical factor for innovation and development but also a decisive element in ensuring long-term business sustainability and competitiveness.

The previous explanations in this chapter have clearly expressed how intellectual capital has categorically developed in recent years. In addition to the actual recruitment, maintaining and passing on the experience and know-how of older employees in the long term represents the even bigger construction site. It shows that the human factor in today's companies with a high proportion of knowledge work - but therefore primarily in the tertiary sector - can no longer be readily substituted.

Innovations can only be secured in the future by maintaining such knowledge resources.

Conclusion

Finally, based on the study analysis conducted, it is evident that nowadays innovations and intellectual capital are crucial and fundamental factors of competitiveness, value creation as well as for current and future financial results of business entities. The study analyzes various literature, definitions and opinions from several authors concerning the terms innovations and intellectual capital, aiming to connect the terms and highlight their general features. In addition, reference is made to current circumstances, which more than illustrate the importance of intellectual capital as an elementary part of human resources. In order for companies to continue to operate successfully in their markets, this resource must be maintained, secured or expanded in order to withstand future developments and be able to tackle innovations in a sustainable manner (especially based on Chapter 4). Therefore, the study demonstrates that there is a positive relationship (i.e., mutual supporters and drivers of value creation) between innovations and intellectual capital and the connection between the two terms is more than justified.

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What Drives the Correlation of Stock and Bond Returns in the US and UK Markets?

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The stock-bond correlation is critical to investment activities, such as forming optimal portfolios, designing hedging strategies, and assessing risk. This paper examines this relationship using a rolling correlation between long-term government bonds and stock returns. We focus on the US and the UK markets and show that the stock-bond correlation follows a similar reverting pattern in both markets during the past twenty years. Overall, volatility in equity market returns, jointly with macroeconomic factors such as interest rates, growth in GDP per capita and inflation, can efficiently explain the rolling correlation between stock and bond returns. However, the stock-bond correlation is not determined by the same macroeconomic factors in both markets, implying that the explanatory power of each factor varies from country to country. The results can provide invaluable insights into asset allocation decisions by forecasting the expected correlation between stock and bond returns using macroeconomic factors.

Keywords: *stock-bond correlation, rolling correlation, macroeconomic drivers, stock market volatility, asset allocation*

Introduction

Numerous studies over the past years have attempted to shed light on the correlation between stocks and long-term government bond returns. In the US and UK context, Shiller and Beltratti (1992) analyzed the returns of these two financial assets, concluding that the subject correlation is too high and there is no need to be justified by a theory. Similar results were reported by Campbell and Ammer (1993), while both studies show that the correlation remains unchanged over the years. Barsky (1989) proves that macroeconomic factors, such as real interest rates, growth of the economy, and market risk, could affect the direction that the returns of the fixed income and equity markets follow. As a result, the same macroeconomic factors could be used to explain the correlation between stock and government bond returns.

More recent studies focus on the factors that affect the direction of the correlation between stock and government bond returns (Johnson et al. 2014). Diverse factors could affect the returns of the two asset classes and their correlation. Fleming et al. (1998) show that the information that flows in the equity and fixed-

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income markets tends to increase market volatility. Furthermore, David and Veronesi (2008) show that the variances and covariances of stock and bond returns could be increased or decreased based on the uncertainty about macroeconomic factors like inflation.

Stivers and Sun (2002) provide a distinct perspective by explaining the "flight to quality" phenomenon; investors switch to safer assets when the risk hikes. The authors suggest that risk could be captured by the volatility in the stock market returns and examine the effect of that increased volatility on the fixed-income market. Similarly, Gulko (2002) found significant changes in the correlation between the stock and bond returns when the stock market is about to crash. In the same vein, Li (2002) shows that uncertainty about expected inflation and interest rates significantly impact the correlation between stock and bond returns. Connolly et al. (2005) also find that market volatility has significant explanatory power of the stock-bond correlation.

A wealth of studies has elaborated on the influence of macroeconomic announcements on both the bond and stock markets (Alfonso et al. 2020, Ambler and Rumler 2019, Alexiou et al. 2018; Cutler et al. 1989, Fleming and Remolona 1999, Balduzzi et al. 2001, Fair 2003). These studies have found that such announcements affect short-term returns of stocks and bonds. Furthermore, Boyd et al. (2005) and Andersen et al. (2007) proposed that the business cycle could explain the correlation between stock and bond returns. Consequently, a stronger correlation is typically observed during economic expansions, while it weakens during economic contractions. Notably, Yang et al. (2009) indicated that the US and the UKs fixed income and equity markets do not necessarily follow analogous patterns. It is therefore evidenced that different markets appear to react diversely during recessions and expansions.

Although many studies have attempted to estimate the correlation between stock and government bond returns and the impact of macroeconomic factors, the results appear inconclusive as the correlation ranges from weak to strong and positive to negative. Overall, it remains difficult to estimate the stock-bond relationship reliably as it can change drastically with macroeconomic conditions.

This paper investigates the correlation between stock and long-term government bond returns, focusing on the US and the UK markets. We show that the stock-bond correlation in both markets follows a similar reverting pattern. One of the key findings of our paper is that different macroeconomic factors determine the correlation between stock and government bond returns in the US and UK. Furthermore, our results suggest that the most significant factor is the uncertainty about the stock market, which is proxied by the volatility of stock returns. Other macroeconomic factors, like interest rates, growth in GDP per capita and the economy's business cycle, are also significant but to a lesser degree.

The remainder of the paper is structured as follows. Section 2 presents a brief account of the related literature and the development of the hypothesis, while section 3 describes the data and the methodology used. Section 4 presents the estimated correlation of the stock-bond returns and provides the model specification. Section 5 reports and discusses the regression results, and section 6 concludes the paper.

Brief Literature Review

Numerous studies have attempted to estimate the correlation between stock and bond returns. These studies differentiate from each other based on asset returns (Shiller and Beltratti 1992), econometric methods (Urga and Cajigas 2006, Baele 2007), sample periods (Lander et al. 1997) and the markets or countries that each study examines (Durre and Giot 2005). One popular model among practitioners that measures the correlation between stock and bond returns is the Fed model, which assumes the expected growth rate equals zero and risk premiums are the same for both asset classes. However, as shown by Estrada (2009), the Fed model provides only valid results for a certain period in the US market.

The results presented by several studies do not provide a clear picture of the correlation between stock and government bond returns. On the one hand, some evidence indicates a positive correlation between stock and government bond returns, as both financial assets are exposed to the same macroeconomic factors. In other words, investors are expected to hold stocks and long-term government bonds in their portfolios when the economy is booming. Several studies provide evidence of a positive correlation between the two financial assets (Keim and Stambaugh 1986, Campbell and Ammer 1993, Kwan 1996). On the other hand, a negative correlation between stock and government bond returns is observed when the economy shrinks and the stock market is down. In such cases, the negative correlation is explained by the investors' risk-averse attitude that opt for safer assets like government bonds; investors rush into them when they fear for the future. Moreover, McMillan (2019) in a study examining the interrelations and time-varying correlations for eight assets, using a one-year rolling correlation framework found that the establisherd correlations exhibited both positive and negative values.

Therefore, as the bond market attracts more investors than the equity market, a negative correlation is generated between these two financial assets. This financial phenomenon that has been observed in several economies is known as "flight to quality" or "flight to safety", (Hartmann et al. 2001). But negative correlation is also observed during big market rallies, when investors are less risk-averse, seeking a high return. Most investors move from the bond to the equity market during these booming periods to generate higher profits. Such a case, also known as "flight from quality", is documented by several studies (Gulko 2002, Connolly et al. 2005, Andersson et al. 2008). These researchers show that stock market uncertainty could affect the correlation between stock and government bond returns. In particular, when market uncertainty is high, the correlation between stock and government bond returns should be negative.

Inflation plays a crucial role in shaping the correlation of equity and bond returns (Lombardi and Sushko 2023). Fama and Schwert (1977) examine the relationship between stock and bond returns in the context of inflation. The authors laid the groundwork for understanding how inflation affects asset returns and, by extension, the correlation between stocks and bonds. Baele et al. (2007) examine the determinants of the correlation between stock and bond returns, focusing on the role of macroeconomic variables and financial market conditions. In a study of the G7 countries over 40 years, Li (2002) found that each country's

stock-bond correlation coefficient follows a similar reverting pattern. In addition, the author finds that interest rates are a principal driver of the correlation. Also, inflation affects stock or bond returns by causing them to move in opposite directions, suggesting a negative correlation.

Development of Hypotheses and Research Questions

Overall, the relationship between stock and bond returns and their correlation remains an important and dynamic research area. The preceding literature review context has highlighted the complex and evolving nature of this correlation and its significance for investors and portfolio managers. In this context, enriching our understanding by looking at other potential factors at play is imperative.

Connolly et al. (2005) suggest that the correlation between stock and bond returns should be negative when uncertainty rises. Increased uncertainty about future economic conditions means that the perceived risk in the market is high. In such cases, the government bonds are preferred by investors. Usually, under these circumstances, investors tend to reallocate their portfolios by showing increased preference for fixed-income securities as considered safer investments. This phenomenon, known as "flight to quality", clearly explains that volatility directly affects the correlation between bond and stock returns. Thus, volatility can be reasonably one of the independent variables in our regression model.

Furthermore, Chiang and Li (2005) show that gross domestic product, which is used as a proxy for the economic growth in a country, has a significant role to play in our model. Specifically, when gross domestic product per capita grows and a country's economic growth rises, the correlation between stock and bond returns should be higher. In a stable economy, where capital inflows are high, and the perceived country risk is low, the demand for financial assets like government bonds and stocks increases. However, when the growth in gross domestic product stalls, the effect on the correlation between stock and bond returns is more complex.

According to Chiang and Li (2005), interest rates and inflation are critical determinants of the correlation between stock and bond returns. Generally, evidence suggests that the interest rate level is positively correlated with the bond-stock correlation. Interest rates positively impact the government bond yield to maturity due to the term structure relationship. In contrast, the federal funds rate and stock returns seem to be negatively associated. In Friedman's (1969) words, "in a moderate growth environment, both stock and bond yields are seen to advance at a moderate pace due to the income effect, while the federal funds rate is likely to be higher when demand for loanable funds as income expands puts pressure on the market". Thus, the result should be a positive relation between stock and bond correlation and the federal funds rate. However, it is argued that inflation causes a decline in stock returns and is typically viewed as a threat to profits by investors. On the other hand, bond yield should be positively associated with inflation. Therefore, the inflation rate is expected to be negatively related to the correlation between stock and bond returns.

In another study, Yang et al. (2009) suggest that the interplay between business cycles and financial markets significantly impacts the correlation between stock and bond returns. Typically, the returns on various financial assets exhibit volatility during economic downturns, prompting investors to seek portfolio risk reduction through diversification. However, the approach to diversification during these extreme periods varies across countries. In the United States, a pronounced correlation between stock and government bond returns is observed during economic expansions, contrasting with a weaker correlation in times of recession. Conversely, Yang et al.'s (2009) findings for the UK present a contrary scenario. As a country heads into a recession, heightened economic uncertainty prompts investors to mitigate their exposure. Subsequently, during recessions, bond prices tend to surge while yields decrease, whereas equity prices tend to plummet. As the economy rebounds, bond prices typically decline while equity prices rise. During tumultuous times, equities, being perceived as risky assets, are avoided.

Initially, taking stock of the aforementioned empirical and theoretical underpinnings, the paper aims to estimate the stock-bond correlation by using a rolling correlation between long-term government bonds and stock returns. As a second step, the paper aims to explore the extent to which various factors influence the estimated rolling correlation between stock and bond returns. Thus, the research questions are formulated as follows:

> *RQ1*: What are the key determinants of the rolling correlation between long-term bonds and stock returns?
> *RQ2*: Do economic uncertainty, GDP growth, interest rates, inflation, and business cycle phases explain the correlation between long-term bonds and stock returns?

Data and Methodology

In the spirit of Chiang and Li (2009), we use the S&P 500 index as a proxy for the US equity market, while the 10-year US bond yield was used to proxy the respective fixed-income market. Similarly, in the UK, the FTSE 100 index was used as a proxy for the equity market, and the 10-year UK bond yield was used as a proxy for the fixed-income market. To summarise, eleven years of daily data, in the period 1995 to 2016, were used for both countries. We used 2016 as a cutoff point for our research because of sharp reversals and non-conventional monetary policies in both countries that took place in the subsequent period. As such, we maintain that the period from 2017 onwards merits a follow-up study encompassing more advanced econometric modelling. The ensuing period marks a regime change, given the ultra-low rates with a material impact on stock and bond valuations.

Table A1 in the Appendix provides the data sources used in this paper. Table 1 presents the descriptive statistics for the stock and bond indices in the two markets, while Table 2 provides the descriptive statistics for the bond and stock returns in the two markets.

Table 1. *Descriptive Statistics for the Market Indexes and the 10-year Government Bonds*

	Mean	Min	Max	Std. Deviation	Skewness	Kurtosis
S&P 500 Index	1,228.15	459.11	2,130.82	364.62	0.41	0.21
FTSE 100 Index	5,377.15	2,954.20	7,103.98	996.35	-0.45	-0.85
10-Year US Govt Bond Yield	4.26	1.40	7.88	1.49	0.01	-0.92
10-Year UK Govt Bond Yield	4.52	1.33	8.8	1.72	0.35	-0.19

Table 2. *Descriptive Statistics for the Returns in Market Indexes and the 10-year Government Bonds*

	Mean	Min	Max	St. Deviation	Skewness	Kurtosis
S&P 500 Index	0.00	-0.09	0.12	0.01	-0.06	8.17
FTSE 100 Index	0.00	-0.09	0.10	0.01	-0.03	5.97
10-Year US Govt Bond Yield	0.00	-0.16	0.10	0.02	0.18	4.23
10-Year UK Govt Bond Yield	0.00	-0.09	0.13	0.02	0.42	6.02

The returns in both markets fluctuate around a mean of zero per cent return with a standard deviation that ranges between 1% to 2%. Nonetheless, extreme daily returns of around +/-10% are observed in the sample. It should also be noted, that the unit root tests produced satisfactory results in all four stock-bond return series. In particular, an ADF test is conducted for all the return series, stock and government bond returns for the two countries. The results indicate that the null hypothesis can be rejected for all four of the return series at 1% significance level, as the computed t-statistic is lower than the critical value. In other words, the ADF test shows that there is no unit root in any of the two returns series, and hence any reasonable forecasting and any regression analysis could be applied and provide reliable results. For economy of space, we opted to leave out the table with the ADF tests but they are available upon request.

In the second part of the paper, we specify and estimate a regression model as we seek to identify the factors with explanatory power on the correlation between stock and government bond returns. The final model specification consists of four independent variables. The first one captures the uncertainty and the economy's risk as proxied by the standard deviation of the stock returns. We also included in our model the growth in GDP per capita and the interest rates for both countries. Last, the model included a dummy variable to capture each country's recessions. For the examined period (1995-2016), according to the Office for National Statistics, the UK has suffered one recession, i.e., the 2008 Global Financial Crisis (GFC). The recession lasted five quarters, from the second quarter of 2008 until the third quarter of 2009. On the other hand, the US has suffered two financial crises since 1996. The '90s, one of the highest expansionary periods in American history (Kliesen 2003), was followed by a brief two-quarter recession in the early 2000s. The second recession occurred with the US housing bubble bursting, culminating in a perfect storm, leading to the GFC. According to the Business

Cycle Dating Committee (2010), the crisis lasted one and a half years, starting in December 2007.

Stock-Bond Returns Correlation and Model Specification

We use the rolling correlation method in the spirit of Chiang and Li (2002). In this method, we calculate a time-varying correlation coefficient using a fixed window rolled ahead along the timeline. The sizes of the proposed and tested windows are (a) a monthly-sized window consisting of 22 trading days and (b) a yearly-sized window consisting of 250 trading days. Table 3 presents the descriptive statistics for the rolling correlation for both markets.

Table 3. *Descriptive Statistics for the Rolling Correlations in the US and the UK*

	Mean	Min	Max	St. Deviation	Skewness	Kurtosis
US Rolling Correlation – 22 Days Window	0.16	-0.86	0.86	0.44	-0.47	-0.91
US Rolling Correlation – 250 Days Window	0.15	-0.65	0.68	0.36	-0.77	-0.32
UK Rolling Correlation – 22 Days Window	0.17	-0.91	0.93	0.41	-0.58	-0.59
UK Rolling Correlation – 250 Days Window	0.16	-0.63	0.65	0.35	-0.90	-0.19

Table 3 shows that the 22-day rolling correlation coefficient is more volatile than the 250-day window. In general, the correlation coefficient is smoother as the window grows longer. The correlation coefficient for the return sample is 0.16 for the US and 0.17 for the UK. Based on the observed low values, there is a very weak positive correlation between the two financial assets. However, there are periods when the correlation coefficient takes extreme values, indicating a strong positive or negative correlation. In particular, as shown in Table 3, there is a positive or a negative correlation above 80% for the 22-day rolling window and above 60% for the 250-day window. The results show that measuring correlation using index levels and returns can give a completely different picture of the relationship between stock and bond markets.

Following the estimation of the correlation coefficient between stocks and long-term government bond returns, we endeavour to identify the macroeconomic determinants of the correlation coefficients. David and Veronesi (2008) and Li (2002) suggest that macroeconomic factors like interest rates, inflation, earnings and growth could affect the correlations significantly. Chiang and Li (2009) classify macroeconomic variables that could affect the correlation between stocks and bonds into three main categories: uncertainty, prosperity-economic growth, and monetary policy variables.

Several studies find that business cycles affect asset returns (Bigio and Schneider 2017, Tian 2018, Rouwenhorst 1995, Erb et al. 1994). Other studies find a stronger correlation between financial assets when the economy expands and a weaker one when the economy shrinks or is in recession (Boyd et al. 2005, Andersen et al. 2007). However, the correlation between the two financial assets

reacts differently in each country. Yang et al. (2009) document different patterns in the correlation between stock and bond returns in the US and the UK when the countries are in a recession or an expansion. In the US, the pattern is the same as previous studies suggest (Boyd et al. 2005, Andersen et al. 2007), but the UK market does not follow the same pattern. In particular, the correlation calculated during the expansions in the UK is more robust than during recessions.

Several studies suggest that the business cycle is a significant factor in modelling the stock-bond returns' correlation. For that reason, the regression model that Chiang and Li (2009) proposed is modified to capture the impact of the business cycles. Thus, the final specification of our model is presented below:

$$\rho_{sb,t} = \varphi_o + \varphi_1 Uncertainty_t + \varphi_2 Prosperity_t + \varphi_3 Monetary_t + \varphi_4 Recession_t + v_t$$

where $\rho_{sb,t}$ is the rolling correlation coefficient; *uncertainty* reflects the expected business risk in the future. This variable is calculated based on the historical returns of the stock markets in the examined countries. According to Chiang and Li (2009), the volatility of stock returns under a specific time frame could be used as a proxy for the business risk in a country. A theoretical approach suggests that when the market is volatile, and the fear about the future economic conditions is rising, investors tend to allocate their assets differently than when the market is under normal situations. *Prosperity* captures the economic growth and is measured by capital inflows, domestic savings, and the real GDP growth rate. When prosperity is higher, as reflected by GDP growth and capital inflows, the correlation between the two markets is stronger and vice versa. The variable *monetary* reflects Fed's monetary policy. According to Chiang and Li (2009), improved liquidity from an expansionary policy when interest rates are low, could lead to a negative correlation between stock and bond returns. On the other hand, during a contractionary monetary policy, when the interest rates are high, a positive correlation between stock and bond returns should be expected. Additionally, Friedman (1969), Ohanian and Stockman (1995) show that interest rates positively correlate with economic expansions when real income and demand increases. We also include a dummy variable that captures the recessions, which could play a significant role in describing the nature of the stock-bond correlation. However, it should be stressed that recessions do not affect each economy similarly (Yang et al. 2009).

Regression Results and Discussion

The final model described before is estimated for each computed rolling correlation. Table 4 reports the regression results for the four estimated models.

Table 4. *Regression Results*

	US Rolling Correlation		**UK Rolling Correlation**	
	22-Days window	**250-Days window**	**22-Days window**	**250-Days window**
Uncertainty	23.198***	11.528***	34.791***	23.909***
	(6.75)	(7.92)	(6.56)	(11.59)
Prosperity	0.002***	0.001***	0.001***	0.001***
	(4.72)	(7.56)	(5.62)	(8.52)
Monetary	-0.057***	-0.082***	0.038	-0.019
	(-7.91)	(-6.12)	(0.52)	(-1.15)
Recession	0.039	0.077	-0.273**	-0.846*
	(0.69)	(1.12)	(-2.24)	(-1.85)
Observations	90	90	90	90
Prob > F	0.000	0.000	0.000	0.000
St. Error	0.260	0.209	0.269	0.263
Adj. R^2	0.60	0.69	0.61	0.61

(*), (**) and (***) denote significance at 10%, 5% and 1% level respectively. t-statisitcs in parentheses.

According to the empirical literature (Li 2002), all three variables (*uncertainty*, *prosperity* and *monetary*) are highly significant in the case of the US. Yet, in the UK, the monetary conditions as proxied by the interest rates do not yield a significant effect. Furthermore, the business cycle proxied by the recession dummy proved significant in the UK, compatible with Boyd et al. (2005) and Andersen et al. (2007), but not in the US. The latter agrees with Yang et al. (2009), who suggest that the impact of the business cycle on the correlation between stock and government bond returns varies across different countries.

Also, our results contradict the "flight to quality" phenomenon. In particular, during the GFC of 2008, the "flight to quality" did not seem to hold. From late 2007 till 2009, uncertainty obtains extreme values due to a very volatile equity market. Following Connolly (2005), investors diversify their portfolios during extreme periods, looking for safer investments. The latter would result in a negative correlation between stock and government bond returns. However, our results show a fivefold increase when the GFC starts, resulting in a strong positive correlation between the two financial assets. Thus, under certain market conditions, the diversification between stocks and bonds may not be as effective as most portfolio managers would assume (Johnson et al. 2014).

In both countries, about 60% of the variation in the rolling correlation is explained by the independent variables. While the same reverting pattern was observed in both countries, the rolling correlations are not explained by the same macroeconomic factors. In contrast to the UK, the business cycle was insignificant in the US. Similarly, the *monetary* variable was significant for the UK but not for the US. Interestingly, for both countries, the most significant variable was *uncertainty*. The remaining independent variables for each country were still significant but to a lesser degree. In passing, our models' reliability proved to be relatively good, judging from the regression diagnostics.

Conclusions

The correlation between stock and long-term government bond returns is crucial for asset allocation decisions as it helps investors diversify their portfolios and manage their exposure.

However, the results of the existing literature are inconclusive because of the dynamic nature of the stock-bond correlation. Overall, estimating the stock-bond relationship reliably remains challenging as it can change drastically depending on the prevailing macroeconomic conditions. This paper examines this relationship from 1995 to 2016 using a rolling correlation between stock and long-term government bond returns and two different window lengths.

We focus on the US and the UK markets and show that the stock-bond correlation follows a similar reverting pattern. A weak positive correlation is observed for both countries. Yet, the macroeconomic factors that drive that correlation differ in the countries examined. In both countries, the estimated models consist of three significant factors, while uncertainty and prosperity are common significant factors in both US and UK. In the case of the US, the third significant factor is monetary, while the business cycle variable is not significant. On the other hand, in the UK, the monetary variable is not significant, suggesting that changes in the interest rates do not affect the correlation between stock and government bond returns in the period considered. Yet, the dummy variable that captures the recessionary periods in UK has a significant impact in line with past empirical studies. While in both markets, uncertainty measured by the volatility in the stock market is the most significant determinant of the stock-bond return correlation, other macroeconomic variables are also important, but to a lesser degree.

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