

# The Interplay of Public Debt, Economic Activity, and Inflation: A Critical Examination

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**Abstract:** This article provides an in-depth analysis of Lebanon's economic challenges, focusing on the intricate interplay between public debt, economic activity, and inflation. It begins by emphasizing the critical role of effective external debt management for developing nations, specifically focusing on Arab countries from 2013 to 2018, highlighting the volatile global economic factors contributing to rising public debt in the region. The concept of sustainable external debt is introduced, underscoring the need for Lebanon to balance fiscal stability with debt management guided by IMF thresholds. Lebanon's financial predicament takes center stage, with its substantial external public debt reaching \$91 billion by 2019, primarily through government bonds, making debt negotiations complex. Historical factors, including the civil war and debt accumulation, are explored for their socioeconomic impact. The article concludes by addressing Lebanon's contemporary crises, including currency instability and banking fragility, and emphasizes the nation's efforts to seek IMF support and implement extensive reforms to tackle its economic and financial turmoil comprehensively.

**Keywords:** Lebanon, Public debt, Inflation, Fiscal stability, IMF support.

## INTRODUCTION

External debt remains manageable as long as governments can meet their debt service obligations and origin, with international financial institutions, especially the World Bank and the International Monetary Fund, evaluating its sustainability or unsustainability based on various criteria, such as the country's economic growth rate, foreign trade conditions, and the availability of external financial resources for repayment. However, these international financial institutions often advocate policies focused on managing these variables, sometimes without considering their potential impact on the country's human well-being and social needs. In addition to the unique characteristics of each country, encompassing historical development, structural attributes, institutional evolution, public policy trajectories, and more, internal factors are intertwined with policy failures. These failures can relate to achieving equilibrium between available resources and needs, mitigating economic shocks, irresponsible borrowing by confident political leaders, and the inherent characteristics of Arab economies. The latter includes a reliance on short-term economic strategies and vulnerabilities within domestic productive sectors (Greiner et al., 2015).

The prevailing structure of the international financial system, which favors capital flows from developing to developed countries, alongside the proliferation of armed conflicts with their profound economic and societal costs, has significantly contributed to the mounting burden of public debt. Within

such contexts, economic and financial vulnerabilities tend to escalate, driving deterioration in public debt dynamics and ultimately shifting government priorities away from developmental pursuits.

Countries emerging from armed conflicts often approach the issue of external debt by the principle of debt sustainability promoted by the International Monetary Fund. Yet, this can be shortsighted, ignoring long-term development strategies. Debt sustainability is often perceived as the ability to service debt, both principal and interest, without seeking deferment or default. However, this approach can lead to continued reliance on debt as a financing source. As such, Lebanon, like other countries, may find itself trapped in a cycle of debt, seemingly compelled to pursue further borrowing. This predicament has been further exacerbated by challenges arising from the confrontation with the Lebanese public, which has shown resistance to austerity measures and the anticipated repercussions of agreements with the World Bank and the International Monetary Fund.

In light of this backdrop, the research aims to explore potential legal and financial mechanisms to address Lebanon's financial crisis while preserving the country's economic, financial, and monetary stability. The study is of significant scientific importance due to Lebanon's precarious financial state, considering internal and external challenges. The research seeks a financial and legal refuge that could help alleviate this crisis. Additionally, the study's importance lies in investigating economic imbalances and challenges, the government's capacity to counteract these issues, halt the economic decline, and eventually restore financial equilibrium and stability.

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To address these research questions, a descriptive-analytical approach has been employed. This approach involves collecting and analyzing data and information concerning Lebanon's public debt and monetary inflation, aiming to understand their implications on the nation's economic and social landscapes.

## **1. LEBANON'S SUSTAINABLE INDEBTEDNESS: A COMPREHENSIVE ANALYSIS**

Effectively managing external debt is of paramount importance for developing countries, especially evident in the context of Arab nations during the period spanning from 2013 to 2018. This timeframe witnessed considerable shifts in global oil and raw material prices and various internal circumstances across the region. These factors significantly impacted public debt dynamics. During this period, several countries experienced a deceleration in fiscal revenues, juxtaposed with rapid growth in public expenditure. This growth stemmed from escalated expenditures such as amplified wages, salaries, social transfers, and support for essential commodity prices, thus culminating in a multifaceted surge in current spending. Consequently, this confluence of events led to a substantial escalation in deficit levels and debt ratios starting in 2014.

To illustrate, the aggregate budget surplus of Arab nations, which stood at 2.5% of GDP in 2013, underwent a considerable transformation, evolving into a deficit of approximately 10% of GDP by 2015. Within this overarching context (El-Khoury, 2017) the cumulative stock of public debt (encompassing both internal and external components) in seven prominent Arab countries – namely Jordan, Tunisia, Bahrain, Egypt, Lebanon, Morocco, and Mauritania – observed an annual growth rate of 8.1% during the 2013 to 2018 timeframe. This resulted in an upward trajectory from approximately \$445 billion in 2012 to approximately \$707.8 billion by 2018. Concurrently, the ratio of public debt to GDP experienced a remarkable shift, surging from around 45% in 2012 to approximately 117% (Yahya et al., 2023).

Notably, the internal segment of public debt contributes substantially to the overall public debt composition. This portion constitutes 67.4% in Egypt, 62% in Morocco and Lebanon, 60% in Jordan, 22% in Tunisia, and 20% in Mauritania, respectively (Al-Qathmi et al., 2023).

In light of the ongoing theoretical and practical discourse encompassing the feasibility and ramifications of resorting to external indebtedness, the contemporary reality incontrovertibly reaffirms the existence of public debt as an actuality. Thus, nations are compelled to navigate external debt through a reasonable strategy, while remaining attuned to considerations safeguarding their economic interests. As such, the imperative for nations, Lebanon in this context, lies not in shunning public debt but in formulating and executing a meticulous approach to address and manage this complex economic aspect.

### **1.1. The Concept of Sustainable External Debt**

Financial sustainability encapsulates a state's capacity to fulfill its prevailing and impending financial commitments,

sans the necessity for debt rescheduling. While the arena of financial policies lacks a universally accepted definition, its essence revolves around the financial equilibrium wherein a state can seamlessly sustain its spending policies and public revenues over the long term, without compromising its fiscal soundness or exposing itself to non-payment and non-fulfillment risks (Brooks et al., 2023).

The International Monetary Fund (IMF) underpins its fiscal sustainability methodology on anchoring the public debt-to-GDP ratio at a designated threshold or setting a specific GDP percentage as an objective. This then serves as a foundational premise upon which fiscal reforms are structured to achieve this ratio, rendering it a bedrock upon which future expectations are constructed, often spanning five years. Sustainability, in this context, implies stabilizing or decreasing the public debt-to-GDP ratio.

Interlocked with the notion of public debt sustainability is the stability of public finances, as the strategies governing borrowing and expenditure must be meticulously fashioned to avert the need for debt servicing cessation or default. Achieving public debt sustainability mandates upholding a stable economy, dissociated from financial crises. The essence of financial sustainability underscores that public debt shouldn't perpetually burgeon in tandem with GDP growth, lest governments continually augment taxes and curtail expenditure on goods and services, thus negating the principle of equitable intergenerational burden-sharing.

### **1.2. Beyond Debt Sustainability: Navigating Lebanon's Complex Landscape:**

The concept of debt sustainability extends beyond the mere absence of insolvency. It encompasses the ability to service the debt without necessitating drastic revenue or expenditure adjustments. It also hinges on avoiding the accrual of an ever-increasing burden of public debt. Typically, when a government acknowledges its incapacity to fulfill its public debt obligations promptly, a strategy of spending reduction comes to the fore as an adjustment measure.

Lebanon finds itself ensnared in a severe economic crisis, exacerbated by protracted political upheavals since October 2019 according to the data from the Association of Lebanese Banks, the country's external public debt reached a staggering \$91 billion by the end of 2019, with government bonds constituting a substantial 94% of this debt. This heavy reliance on government bonds complicates negotiation dynamics, as Eurobond-based debt transactions occur primarily through financial markets, bypassing bilateral agreements with governments or international financial institutions (Al-Nahar Newspaper, 2023)

Challenges loom large over Lebanon's financial and international obligations. Even amid the direst circumstances, the country honored a sovereign bond repayment of \$1.5 billion in November 2019, attesting to its commitment to meeting financial obligations under extraordinary conditions. To gauge the present scale of public debt and its evolution since the onset of the crisis, it's crucial to dissect the debt into foreign currency debt securities (Eurobonds) and Lebanese pound debt securities. Delving into these figures reveals the

additional costs incurred due to delays in restructuring foreign currency debts, notably Eurobonds (Hage Boutrous, 2022).

As of the last quarter of 2019, Lebanon's outstanding Eurobonds amounted to \$33.75 billion, while Lebanese pound debt reached approximately \$57.9 billion, culminating in a total public debt of about \$91.65 billion. At that juncture, this debt constituted over 176% of the GDP, placing a substantial burden on annual public budgets. By late 2022, the value of Eurobonds had ballooned. Lebanon's Eurobond debt in hard currency approached \$41.34 billion, marking a staggering 23% increase compared to late 2019 values (CEIC, 2022).

## 2. THE ESCALATION OF LEBANON'S INFLATIONARY BOND VALUES: A CONSEQUENCE OF DEFERRED NEGOTIATIONS AND STRATEGIC CHALLENGES

The inflationary surge in bond values has been principally fueled by the accumulation of interest dues over the preceding three years, a direct consequence of the Lebanese government's delay in engaging with creditors to restructure these bonds. Noteworthy is the fact that the Lebanese state, since March 2020, has refrained from bond repayment, without embarking on the formulation of a comprehensive strategy to systematically restructure these looming debts. It's important to underline that this strategic development had been a stipulation of the staff-level agreement established with the International Monetary Fund during the preceding year.

In succinct terms, the present and comprehensive value of debt as of late 2022, encompassing both dollar-denominated Eurobonds and Lebanese pound-denominated bonds, does not surpass the threshold of \$42.27 billion. It is crucial to acknowledge that this recalibrated figure is derived from the recalculated public debt in Lebanese pounds, employing the prevalent exchange rate, a departure from the official rate utilized in Ministry of Finance reports. While this amount is substantial, twice the size of the Gross Domestic Product, it stands notably beneath the figures presently proclaimed by the Ministry of Finance (Blominvestbank, 2023)

## 3. IMPACT OF LEBANON'S RECONSTRUCTION AND SUBSEQUENT CRISES ON ITS SOCIOECONOMIC LANDSCAPE: A TALE OF ECONOMIC RESILIENCE AND CHALLENGES

Lebanon's trajectory of reconstruction initiatives intertwined with successive crises has had far-reaching implications. Beyond the evident socioeconomic costs and the erosion of the country's social fabric, the Lebanese economy has borne the brunt of a tumultuous history, shaped by the scars of the civil war. This tumult has manifested in the form of severe infrastructural damage and hindered productivity. Closer scrutiny of public spending post-civil war, particularly during the period between 1993 and 1998, illuminates the intricacies of these challenges (Akkab, 2022).

Over the span of six years, the total public expenditure reached a substantial 38,436 billion Lebanese pounds, or approximately 24.25 billion USD, considering the prevailing

exchange rates at the time. This escalation in expenditure can be attributed significantly to the elevated cost of servicing public debt, which accounted for 36% of the total public expenditure during this period. Astonishingly, over half of this amount, equivalent to 4.6 billion USD, was allocated to servicing public debt. The confluence of factors, including the accumulation of additional debt during the years 1993-1998 and a resurgence of budget deficits, contributed to this trajectory (Barazy, 2023).

This trend was a result of multifaceted dynamics. On one hand, it stemmed from heightened financial obligations triggered by augmented spending in domains such as social, health, and educational services. This also encompassed salary, wage, and pension hikes aimed at enhancing citizen incomes. Additionally, increased allocations were channeled toward the armed forces and security personnel, seeking to ameliorate their living conditions and, subsequently, enhance overall societal and security aspects.

However, it's vital to note that the government grappled with substantial challenges in instituting comprehensive administrative reforms. Additionally, the inability to achieve substantial augmentations in imports, compounded by the persistent specter of Israeli occupation, security crises, incursions, and threats, exerted a considerable economic toll. A case in point is the adverse economic impact of the April 1996 war, Israel's second major post-Taif attack following the 1993 aggression.

The ramifications of this 1996 aggression were profound. The real economic growth rate plummeted from 6.5% in 1995 to 4% in 1996, reflecting the tumultuous times. A comparison between the projected and actual revenues in the 1996 budget underscored a significant shortfall, amounting to approximately 492 billion Lebanese pounds. This revenue gap was exacerbated by a corresponding increase of 776 billion Lebanese pounds in public expenditures, directly attributable to the Israeli aggression. The cumulative financial toll of this aggression on the Lebanese treasury was conservatively estimated at a minimum of around 1,268 billion Lebanese pounds, or more than 800 million USD (Abdel Halim, 2019).

### 3.1. Post-War Debt Escalation and its Social Implications: Struggles with Inequality

The cessation of the Lebanese civil war in 1990 marked the commencement of a disconcerting trend - a surge in public debt and the subsequent exacerbation of socioeconomic inequality (Baumann, 2021). This unsettling trajectory posed a significant threat to the nation's stability, as wealth and income disparity in Lebanon began mirroring some of the most unequal economies globally.

In the immediate aftermath of the civil war, spanning from mid-October 1990, four governments and two Central Bank governors presided over Lebanon during the initial two years. This period saw fluctuating leadership and exchange rates. Notably, the first government, headed by Salim al-Hoss, stepped down on December 24, 1990, with an exchange rate of 790.45 Lebanese pounds per US dollar. Subsequently, a government helmed by Omar Karami assumed power from December 24, 1990, to May 19, 1992. This

phase witnessed exchange rate fluctuations ranging from 10% to 15% from the original rate before surging to 929.26 Lebanese pounds per dollar in March 1992, culminating in 1621.11 Lebanese pounds by May 1992. The third government, under Rashid El Solh, governed from May 16, 1992, to October 31, 1992, during which the exchange rate peaked at 2527.75 Lebanese pounds per dollar in September 1992. Finally, Rafik Hariri's government, taking office on October 31, 1992, catalyzed a gradual decline in the national currency's exchange rate. Worth noting is the context that the US dollar's exchange rate, post-war, was 886.67 Lebanese pounds (Abdel Halim, 2019).

While the Lebanese economy registered a modicum of growth following the war's cessation, this progress was marred by its failure to foster equitable development and impartial resource distribution. Instead, economic growth was marred by the proliferation of social divisions and grievances.

### **3.2. Debt-Servicing Challenges and Their Impact on Income Distribution**

Lending terms and conditions have culminated in a formidable debt-servicing burden for the Lebanese government. This, in turn, has constrained the availability of resources for more even-handed redistribution endeavors. The interplay of three distinct factors after the Civil War significantly influenced income distribution:

1. The public debt experienced a disproportionately high surge, far outpacing the growth of gross GDP.
2. Public borrowing in the post-war era was predominantly reliant on the local market, predominantly through government bonds issued in Lebanese pounds.
3. Notably, the interest rate attached to debt in Lebanese pounds was strikingly elevated.

While these factors individually would not necessarily disrupt income distribution, their synergistic effects birthed favorable conditions for a particular economic sector, primarily the commercial banking domain (Salti, 2019).

Numerous donor conferences in the early 21st century managed to secure vital financial aid for Lebanon. Regrettably, most of these funds were channeled toward the country's escalating debt and the stabilization of the local currency. Consequently, donor contributions have exerted only a limited influence on directing essential social services, fostering inclusive economic growth, employment opportunities, and equitable development (Daher, 2019).

## **4. SIMULTANEOUS CRISES UNVEIL LEBANON'S PRECARIOUS ECONOMIC LANDSCAPE**

Lebanon is grappling with a convergence of three profound crises that have cast a shadow over its economic stability:

### **4.1. First Crisis: Balancing Payments and Currency Turmoil**

The forecasted shortfall of approximately \$8 billion in the supply of the US dollar against its soaring demand this year

looms ominously. Failure to bridge this chasm would plunge the Lebanese economy into a quagmire characterized by formidable challenges. These challenges encompass an arduous external debt repayment scenario, a scarcity of essential imported goods, a devaluation of the Lebanese pound, and the grim specter of economic contraction.

### **4.2. Second Crisis: Fiscal Precipice**

1962 was the pivotal juncture marking Lebanon's fiscal landscape transformation. What was once a budgetary surplus transformed into a deficit for the first time? This watershed year saw the deficit escalate to an alarming 13.2% in expenditure. From 1963 to 1975, a litany of budgetary deficits unfolded, interspersed only by the exceptions of 1971, 1972, and 1974. The tumultuous Civil War era initiated a cycle of continuous financial deficits, perpetuated by war-induced fiscal mayhem and anemic post-conflict economic reforms.

Notably, the civil war's intensification in 1978 cast a shadow over reliable financial statistics, rendering accurate assessments of Lebanon's fiscal state an onerous task. Amidst this chaos, the Ministry of Finance ceased publishing national account data, contributing to an environment characterized by erratic public spending and a conspicuous absence of central control. Between 1982 and 1985, expenditure surged by an astounding 178%, while revenues lagged at a mere 65%. The following years witnessed an even more pronounced imbalance, with expenditure soaring by 702% between 1986 and 1988, outpacing revenue growth at 250% (Tradingeconomics, 2023)

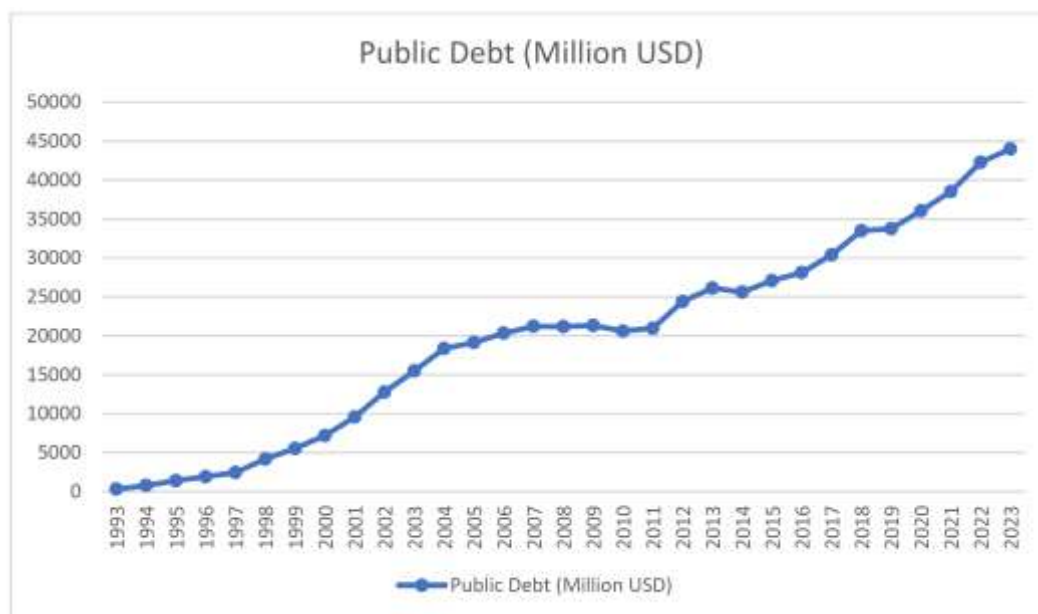
Amidst these fluctuations, the total public debt owed by the Lebanese government stood at approximately \$3 billion by the end of 1992. The servicing costs of this debt, calculated based on Central Bank-approved annual interest rates, amounted to a staggering 30 trillion Lebanese pounds by 2011. The US dollar-denominated debt exhibited a similar trajectory, reaching approximately \$2 billion over the same period.

### **4.3. Third Crisis: Banking System Precariousness**

The Lebanese banking sector, including the Central Bank of Lebanon, directs nearly half of its assets into Lebanese sovereign debt. Additionally, approximately a quarter of these assets are channeled into precarious loans to the private sector. This dire situation manifests as a banking sector grappling with insolvency and a pervasive liquidity dearth. Despite recent measures aimed at curbing fund movement and banking transactions, there has been a surge in deposit withdrawals. Traditionally, the Central Bank would step in to infuse much-needed liquidity, but Lebanon's economic trajectory has been diverging from such standard responses.

The year 2020 witnessed Lebanon's government unveiling a five-year reform and economic revival plan. This ambitious blueprint was crafted against the backdrop of seeking support from the International Monetary Fund (IMF) and the CEDRE conference. The conditions for this support, however, proved arduous, demanding a policy overhaul and expenditure rationalization (IMF, 2022).

Yet, a strategic move to halt bond payments and initiate their sale to foreign entities has highlighted a potential shift to-



**Fig. (1).** Public Debt (1993-2023).

wards internationalizing the crisis. This maneuver could pave the way for an international guarantee aimed at rejuvenating Lebanon's beleaguered financial and political systems. As the government discreetly seeks to fulfill the stringent IMF conditions, with an eye on reducing the public budget deficit, it embarks on a path that could unlock crucial IMF support. This strategic approach positions Lebanon to address its looming debt obligations and initiate a schedule for settling outstanding bonds.

Amidst the ongoing turmoil, and cognizant of the demand for substantial and sustainable reforms, the government, faced with an intricate economic and financial crisis, has initiated tentative steps towards close cooperation with the IMF. In February 2020, the government sought extensive technical assistance and guidance from the IMF during its visit to Lebanon, signaling a gradual yet purposeful move toward comprehensive reform and recovery planning.

The presented data vividly illustrates an unwavering and gradual ascent in Lebanon's governmental debt spanning the years 1993 to 2023. This persistent trend underscores an enduring and consistent rise in debt within the nation's fiscal landscape. During the phase of acceleration, encompassing the 1990s and early 2000s, a discernible pattern of moderate debt growth emerged between 1993 and 1999. However, a distinct transition unfolded in the early 2000s, characterized by a substantial surge in the rate of debt accrual. This results in an almost twofold amplification in debt levels from 1999 to 2002.

The epoch extending from the early 2000s to the mid-2010s is hallmarked by a pronounced and rapid elevation in debt, marking a phase of swift expansion. The data strikingly portrays a remarkable tripling of debt between 2002 and 2015. This rapid escalation can be attributed to a multitude of factors, including intricate economic dynamics, fiscal deficits, and borrowing endeavors aimed at bolstering developmental initiatives or addressing burgeoning public expenditures.

From the mid-2010s to the present, a discernible deceleration in the pace of debt accumulation is evident, albeit within an overarching upward trajectory. Throughout this specific period, the data reveals an array of fluctuations in growth rates, shedding light on distinct levels of economic stability and the implementation of diverse policy measures. The influence of pivotal events becomes evident as certain years emerge as transformative milestones due to notable economic or geopolitical incidents. It is worth highlighting that shifts in growth rates might have been influenced by the global financial crisis in 2008, along with regional geopolitical tensions or domestic economic contexts that potentially shaped distinct growth patterns in specific years.

The phenomenon of reform dynamics manifests sporadically, revealing detectable instances of reduced or decelerated debt escalation. These occurrences may signify the execution of targeted policy measures aimed at mitigating debt increases or instituting proactive fiscal reforms.

Turning to the issue of sustainability, the persistent rise in public debt raises crucial questions about its long-term viability. A thorough assessment of its impact on the economy necessitates an examination of the debt-to-GDP ratio. This metric offers a more accurate gauge of the debt's proportional weight on the overall national economic output. The potential implications are significant: the relentless increase in public debt, especially when coupled with a growth pattern, raises concerns about a nation's capacity to meet its financial obligations. Such apprehensions encompass a spectrum of effects, encompassing the broader economic stability, investor confidence, and the nation's engagement with international financial markets (Al-Sawi, 2020).

In summary and upon reflection, the data constructs a narrative wherein Lebanon grapples with an enduring and escalating burden of public debt extending across several decades. This underscores the paramount importance of adept financial stewardship, the enactment of robust economic reforms,

and the establishment of sustainable developmental strategies to effectively address, alleviate, and ultimately navigate this intricate and multi-faceted fiscal challenge.

## 5. ANALYZING THE COMPLEX INTERPLAY OF PUBLIC DEBT AND INFLATION IN ECONOMIC CONTEXT

Numerous studies have delved into the topic of the impact of public debt on monetary inflation, and some of the notable ones are outlined below:

(Kwon et al. 2006) conducted an empirical investigation into the relationship between public debt and inflation using panel data from 1963 to 2004 across 71 countries. Employing both Ordinary Least Squares (OLS) estimation and a Vector Autoregression (VAR) model, their findings indicate a robust link between public debt and inflation, particularly in heavily indebted developing nations. In other developing countries, the relationship is less pronounced, and in developed economies, it tends to be weaker. It's noteworthy that this connection diminishes under rigid exchange-rate regimes.

Examining the period before reaching the fiscal limit, (Davig et al., 2011) explored the interaction between rapidly increasing debt and expectations of policy adjustments. Their analysis suggests that explosively growing debt, within a certain timeframe, does not exert a significant impact on inflation when households anticipate all adjustments to be executed.

Additionally, a study conducted by (Van Bon Nguyen 2015), titled "The effects of public debt on inflation in developing economies of Asia: An empirical evidence based on panel differenced GMM regression and PMG estimation," delved into the impact of various variables on inflation in developing Asian economies. The study scrutinized eight variables, including Public Debt, DM2, Real GDP per Capita Growth, Private Investment (PINV), Budget Revenue, Government Investment, Total Expenditure, and Trade Openness.

### 5.1. Exploring Correlations: Interrelationships among Economic Indicators in the Context of Public Debt and Inflation

Within the context of our investigation, we intend to engage in an extensive exploration of the variables scrutinized within Nguyen's study from 2015. However, our central focus will be dedicated to an in-depth evaluation of the variable pertaining to public debt. The deliberate emphasis on the realm of public debt among the array of factors under investigation in Nguyen's research is driven by our core aim of unraveling its intricate influence on the broader economic landscape. Through a meticulous analysis of the nuanced aspects inherent to this specific variable, our goal is to unveil its potential correlations, dynamics, and ramifications. Hence, contributing to a deeper comprehension of the role that public debt plays within the intricate network of economic interactions and outcomes that impact inflation.

YEAR	Inflation	Public Debt	DM2	Real GDP per Capita Growth	Private Investment (PINV)	budget Revenue	Government Investment	Total Expenditure	Trade Openness
2009	1.2	53.7806038	0.0964856	20.01	26.92	23.8083119	13.6740995	32.1695895	90
2010	3.98	52.6287229	0.102498	7.63	24.93	21.8868093	12.2198708	29.4144134	95
2011	4.97	52.860483	0.0974296	2.84	26.84	23.3766202	11.7237111	29.2406834	102
2012	6.58	47.8862847	0.0980736	7.41	24.78	21.3453569	11.1348546	30.2633736	89
2013	4.82	45.2501849	0.0972799	-2.88	27.61	20.0944252	11.5984341	29.0962562	86
2014	1.85	42.6399211	0.1012368	-7.14	24.96	22.6194144	12.8948099	29.0084367	80
2015	-3.75	41.7702753	0.104453	1.79	22.22	19.1781322	13.7961716	27.0940597	72
2016	-0.78	47.4590559	0.1068964	4.74	23.14	19.4010814	15.3849593	29.0676397	68
2017	4.32	49.0422546	0.0990329	6.21	21.78	21.9219816	16.2642087	29.0049496	68
2018	6.08	46.4210664	0.0928278	6.29	22.487	21.0299279	16.4939676	32.4063518	68
2019	3.01	50.3280322	0.0971969	-3.26	12.322	20.6596554	17.3842209	31.5578793	63
2020	84.6	46.235997	0.0577234	-37.26	9.548	13.1178351	12.6238397	16.6092073	50
2021	154.76	212.4645439	0.0290557	-26.14	8.44	7.4518594	5.6830526	9.6439506	79
2022	171.2	230.0038647	0.0112641	-14.79	7.36	6.8971981	4.5896741	8.16439817	78.83

Table 1. Pearson Correlation.

		Inflation	Public Debt	DM2	Real GDP per Capita Growth	Private Investment (PINV)	Budget Revenue	Government Investment	Total Expenditure	Trade Openness
Inflation	Pearson Correlation	1	.927**	-.994**	-.731**	-.837**	-.964**	-.827**	-.977**	-.163
	Sig. (2-tailed)		.000	.000	.003	.000	.000	.000	.000	.578
	N	14	14	14	14	14	14	14	14	14
Public Debt	Pearson Correlation	.927**	1	-.917**	-.480	-.702**	-.873**	-.847**	-.876**	.060

Table 1 shows the Pearson correlation among the variables of the study. The Pearson correlation coefficient ranges from -1 to 1 and indicates the strength and direction of a linear relationship between two variables. A positive correlation indicates that as one variable increases, the other tends to increase as well, while a negative correlation indicates that as one variable increases, the other tends to decrease. The p-value, often denoted as "Sig. (2-tailed)" in statistical output, is a measure that helps determine the significance of a correlation coefficient. In this context, the p-value indicates the probability of observing the calculated correlation coefficient if there is no true correlation between the two variables.

The results are as follows:

- **Correlation Between Inflation and Public Debt:** The correlation coefficient is 0.927 which means that there is a strong and positive correlation between inflation and public debt. The corresponding p-value is 0.000 which indicates that the correlation is statistically significant at any reasonable significance level (0.01), suggesting that there is a significant correlation between inflation and public debt. Thus, it can be concluded that there is a strong, positive, and significant correlation between inflation and public debt. When inflation increases, public debt tends to increase as well. This is in line with economic intuition. When inflation is high, governments often resort to borrowing to finance their spending needs, which can contribute to an increase in public debt.
- **Correlation Between Inflation and DM2:** The correlation coefficient is -0.994 which means that there is a strong and negative correlation between inflation and DM2. The corresponding p-value is 0.000 which indicates that the correlation is statistically significant at any reasonable significance level (0.01), suggesting that there is a significant correlation between inflation and DM2. Thus, it can be concluded that there is a strong, negative, and significant correlation between inflation and DM2. This implies that changes in inflation are highly associated with corresponding changes in the money supply. The high negative correlation coefficient suggests a consistent pattern of behavior between these two variables across the observed data points. The negative correlation between inflation and

money supply aligns with conventional monetary policy principles. Central banks often use monetary policy tools to control the money supply in the economy. When inflation is rising, central banks may implement measures to reduce the money supply to curb excessive demand and inflationary pressures. Conversely, when inflation is low, central banks may increase the money supply to stimulate economic activity.

- **Correlation Between Inflation and Real GDP per Capita Growth:** The correlation coefficient is -0.731 which means that there is a strong and negative correlation between inflation and Real GDP per Capita Growth. The corresponding p-value is 0.000 which indicates that the correlation is statistically significant at any reasonable significance level (0.01), suggesting that there is a significant correlation between inflation and Real GDP per Capita Growth. Thus, it can be concluded that there is a strong, negative, and significant correlation between inflation and Real GDP per Capita Growth. Thus, when inflation increases, Real GDP per Capita Growth tends to decrease, and when inflation decreases, Real GDP per Capita Growth tends to increase. This negative relationship is consistent with economic theory and practical observations.
- **Correlation Between Inflation and Private Investment (PINV):** The correlation coefficient is -0.837 which means that there is a strong and negative correlation between inflation and private investment. The corresponding p-value is 0.000 which indicates that the correlation is statistically significant at any reasonable significance level (0.01), suggesting that there is a significant correlation between inflation and private investment. Thus, it can be concluded that there is a strong, negative, and significant correlation between inflation and private investment. When inflation increases, private investment tends to decrease, and when inflation decreases, private investment tends to increase. This negative relationship aligns with economic theory and is a key consideration in macroeconomic policy. High levels of inflation can lead to uncertainty and unpredictability in an economy. When inflation is high, businesses and investors may be less willing to commit

to long-term investment projects due to the potential erosion of the value of their investments over time.

- *Correlation Between Inflation and Budget Revenue:* The correlation coefficient is -0.964 which means that there is a strong and negative correlation between inflation and budget revenue. The corresponding p-value is 0.000 which indicates that the correlation is statistically significant at any reasonable significance level (0.01), suggesting that there is a significant correlation between inflation and budget revenue. Thus, it can be concluded that there is a strong, negative, and significant correlation between inflation and budget revenue. When inflation increases, budget revenue tends to decrease, and when inflation decreases, budget revenue tends to increase. This negative relationship aligns with economic theory and practical observations of how inflation affects government finances.
- *Correlation Between Inflation and Government Investment:* The correlation coefficient is -0.827 which means that there is a strong and negative correlation between inflation and government investment. The corresponding p-value is 0.000 which indicates that the correlation is statistically significant at any reasonable significance level (0.01), suggesting that there is a significant correlation between inflation and government investment. Thus, it can be concluded that there is a strong, negative, and significant correlation between inflation and government investment. When inflation increases, government investment tends to decrease, and when inflation decreases, government investment tends to increase. This negative relationship aligns with economic theory and is crucial for understanding the implications of inflation on public sector spending. High inflation can erode the purchasing power of

money and increase the cost of projects, which might lead to reduced budget allocations for government investment.

- *Correlation Between Inflation and Total Expenditure:* The correlation coefficient is -0.977 which means that there is a strong and negative correlation between inflation and total expenditure. The corresponding p-value is 0.000 which indicates that the correlation is statistically significant at any reasonable significance level (0.01), suggesting that there is a significant correlation between inflation and total expenditure. Thus, it can be concluded that there is a strong, negative, and significant correlation between inflation and total expenditure. When inflation decreases, total expenditure tends to increase. This negative relationship aligns with economic theory and provides insights into how inflation impacts overall government spending. In addition, the negative correlation between inflation and total expenditure points to the effects of inflation on government finances. High inflation can increase the cost of goods, services, and projects, which might lead to constraints on total government spending.
- *Correlation Between Inflation and Trade Openness:* The correlation coefficient is -0.163 which means that there is a weak and negative correlation between inflation and trade openness. The corresponding p-value is 0.578 which indicates that the correlation is insignificant (p-value > 0.05), suggesting that the relationship between inflation and trade openness might not be statistically meaningful or robust. The lack of statistical significance implies that the observed correlation might not have practical or meaningful implications for explaining variations in trade openness based solely on changes in inflation.

## 5.2. The Regression Analysis

**Table 2. Correlations Inflation - Public Debt.**

Correlations			
		Inflation	Public Debt
Pearson Correlation	Inflation	1.000	.927
	Public Debt	.927	1.000
Sig. (1-tailed)	Inflation	.	.000
	Public Debt	.000	.
N	Inflation	14	14
	Public Debt	14	14

**Table 3. Descriptive Statistics.**

Descriptive Statistics			
	Mean	Std. Deviation	N
Inflation	31.6314	59.87223	14
Public Debt	72.769377886	63.0937436262	14



Table 4. Model Summary.

Model	R	R Square	Adjusted R Square	Std. The error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.927 <sup>a</sup>	.860	.848	23.30557	.860	73.798	1	12	.000

a. Predictors: (Constant), Public Debt

Table 5. Anova Test.

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	40083.095	1	40083.095	73.798	.000 <sup>b</sup>
	Residual	6517.793	12	543.149		
	Total	46600.888	13			

a. Dependent Variable: Inflation  
b. Predictors: (Constant), Public Debt

Table 6. Coefficients.

Coefficients <sup>a</sup>								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-32.412	9.715		-3.336	.006	-53.578	-11.245
	Public Debt	.880	.102	.927	8.591	.000	.657	1.103

a. Dependent Variable: Inflation

Based on the regression analysis, the following can be noted:

- The R-squared value (R<sup>2</sup>) of 0.860 indicates that approximately 86% of the variance in the dependent variable "Inflation" is explained by the independent variable "Public Debt".
- The adjusted R-squared value of 0.848 takes into account the number of predictors and is a more reliable indicator of the model's goodness of fit.
- The standard error of the estimate is 23.30557, which measures the average distance between the observed values and the predicted values.
- The F-statistic of 73.798 with degrees of freedom 1 and 12 indicates that the model's fit is statistically significant.
- The significance level (Sig. F Change) of 0.000 (<0.01) suggests that at least one of the predictors in the model is significant in explaining the variance in the dependent variable.
- The intercept (Constant) of the regression model is -32.412. This value is the predicted value of "Inflation" when "Public Debt" is zero.
- The coefficient for "Public Debt" is 0.880. This means that for a one-unit increase in "Public Debt", "Inflation" is predicted to increase by 0.880 units.

- The standardized coefficient (Beta) for "Public Debt" is 0.927, indicating that the effect of "Public Debt" on "Inflation" is quite strong.
- The t-value of 8.591 with a very low p-value (Sig. = 0.000) indicates that the coefficient for "Public Debt" is statistically significant.
- The 95% confidence interval for the coefficient of "Public Debt" lies between 0.657 and 1.103.

In conclusion, the results of the regression analysis suggest that there is a significant positive relationship between "Public Debt" and "Inflation", where an increase in public debt is associated with an increase in inflation. The model appears to have a strong explanatory power based on the high R-squared value, and the coefficient for "Public Debt" is statistically significant.

Thus, based on the results, the equation for predicting "Inflation" (the dependent variable) using "Public Debt" (the independent variable) can be written as follows:

$$\text{Inflation} = -32.412 + 0.880 * \text{Public Debt}.$$

Based on the analysis presented above, the model summary furnishes insights into the degree to which the linear regression model aligns with the data and elucidates the connection between the variables.

- The coefficient of determination (R-squared) is 0.860, indicating that approximately 86.0% of the variability observed in the dependent variable, Inflation, can be accounted for by the independent variable(s). This suggests that the chosen predictor(s) contribute significantly to explaining the fluctuations in Inflation.
- The adjusted R-squared of 0.848 is slightly lower than the R-squared. It considers the complexity of the model by accounting for the number of predictors, giving a more reliable indication of how well the model generalizes to new data.
- The standard error of the estimate, 23.30557, represents the typical amount by which the actual Inflation values deviate from the predicted values by the model. Smaller values of this measure indicate that the model's predictions are closer to the actual data points.

The ANOVA table dissects the sources of variance within the model, assessing the significance of the model as a whole.

- The "Regression" row demonstrates that the overall regression model is statistically significant, with an F-statistic of 73.798. The associated p-value of 0.000 suggests a near-zero probability of obtaining such results due to chance. This implies that the inclusion of at least one predictor variable is meaningful in explaining the variance in Inflation.
- The "Residual" row accounts for unexplained variance within the model. This leftover variance reflects the natural variability in the data that the model cannot explain.
- The "Total" row represents the overall variability in the dependent variable, combining the explained variance by the model and the unexplained variance.

The coefficient section details the relationship between each predictor and the dependent variable.

- The "Constant" term with a coefficient of -32.412 represents the predicted value of Inflation when all predictor variables are set to zero. In this context, it provides a baseline estimate for Inflation.
- The coefficient of 0.880 for "Public Debt" indicates that, on average, for each unit increase in Public Debt, the predicted Inflation increases by 0.880 units. This suggests a positive linear relationship between Public Debt and Inflation while keeping other predictors constant.
- The standardized coefficient (Beta) for "Public Debt" is 0.927. This implies that a one-standard-deviation increase in Public Debt corresponds to a 0.927 standard-deviation increase in Inflation. This standardized measure helps compare the relative impact of different predictors.
- The significant t-value of 8.591 ( $p < 0.001$ ) associated with "Public Debt" suggests that the coefficient is unlikely to have occurred by chance. This rein-

forces the evidence that Public Debt is a meaningful predictor of Inflation in this context.

- The 95% confidence interval (0.657 to 1.103) for the coefficient of "Public Debt" indicates that we can be reasonably confident that the true coefficient lies within this range.

In summary, the results of the linear regression analysis revealed that Public Debt has a substantial and statistically significant positive impact on Inflation. The model explains a significant portion of the variation in Inflation, suggesting that Public Debt plays a crucial role in influencing inflationary trends. However, while the analysis establishes a correlation between the two variables, causation cannot be determined solely from this study. It's important to consider the broader context and potential confounding factors when interpreting these results and drawing any conclusions about the causal relationship between Public Debt and Inflation.

In conclusion, the conducted linear regression analysis has provided valuable insights into the relationship between Public Debt and Inflation. The results indicate a significant and positive association between these variables, shedding light on the potential impact of Public Debt on inflationary trends. The model's coefficient of determination (R-squared) of 0.860 demonstrates that approximately 86.0% of the variation in Inflation can be explained by changes in Public Debt, underlining the model's ability to capture and quantify this relationship. Moreover, the adjusted R-squared value of 0.848 reaffirms the model's reliability, accounting for the complexity introduced by the number of predictors.

The ANOVA results further emphasize the statistical significance of the regression model. The substantial F-statistic (73.798) and the associated p-value (0.000) underscore the significance of Public Debt as a predictor in explaining the observed variation in Inflation.

Examining the coefficients provides additional clarity. The coefficient of 0.880 for Public Debt indicates that, on average, a unit increase in Public Debt corresponds to a predicted increase of 0.880 units in Inflation, while holding other variables constant. The standardized coefficient (Beta) of 0.927 signifies that Public Debt's impact on Inflation remains strong even when considering the standardized units of the variables.

The t-value of 8.591, with a corresponding p-value of less than 0.001, underscores the statistical significance of the Public Debt coefficient. This finding offers robust evidence that the positive relationship between Public Debt and Inflation is unlikely to have arisen by random chance alone.

Furthermore, the 95% confidence interval (0.657 to 1.103) for the Public Debt coefficient provides a range within which we can be reasonably confident the true coefficient lies, aiding in interpretation and prediction.

However, it is important to note that while this analysis establishes a correlation between Public Debt and Inflation, it does not imply causation. Other latent variables and economic factors might also contribute to the observed trends. Therefore, any policy or decision-making based solely on this analysis should be approached cautiously and in conjunction with broader economic insights.

In conclusion, the study's findings strongly suggest that Public Debt plays a significant role in influencing inflation, as evidenced by the robust statistical relationships identified. This analysis serves as a valuable contribution to understanding the dynamics between Public Debt and Inflation, offering guidance for further exploration and policy considerations in the realm of economic policymaking and analysis.

## 6. HARMONIZING PUBLIC FINANCES AND EXERCISING FISCAL RESPONSIBILITY IN LEBANON AS A STRATEGY TO MITIGATE INFLATION

Firstly: Reviewing the Methodology of Public Expenditure in Government Budgets

Lebanon, like numerous other nations, grapples with an extensive public debt burden and contends with constrained fiscal leeway within the context of public finances. Despite these challenges, there exist pressing spending necessities such as the expansion of contemporary social protection systems and the enhancement of wage levels. Moreover, there is an imperative to augment the quality of ongoing public expenditures while channeling them in a more optimal direction. This is especially critical due to the dominance of public sector worker wages within the budget, the misallocation of support systems, the strain of debt service obligations on public spending, and the history of budget non-approval. Consequently, there arises a need to reassess and enhance the quality of public spending by:

- Refocusing public expenditures within budget frameworks to enhance the productivity and performance of employees and workers.
- Reducing superfluous and indiscriminate subsidies directed towards disadvantaged segments of the population.
- Instituting reforms in state-owned enterprises, including sectors like electricity, telecommunications, and infrastructure.

All these undertakings should be guided by the principles of Public Spending Regulation, in addition to conducting a comprehensive analysis of the repercussions of direct and indirect taxes, customs tariffs, and government expenditures on real income. Advice on infrastructure financing and debt management should also be a key component.

Secondly: Embracing Transparency in Lebanese Government Debt Management

The absence of lucid figures and comprehensive reporting of debts, coupled with challenges in fulfilling debt obligations amidst an ongoing economic crisis, continues to be a prevailing concern. Officials' assertions about prospective growth have been overly optimistic, resulting in the oversight of early warning signals of potential debt distress. This comes against the backdrop of Financial Policy Planning which rested on erroneous assumptions regarding the future dynamics of the debt-to-GDP ratio, which had surged to over 174% at the outset of 2019.

Therefore, it is incumbent upon the Lebanese government to adopt a policy of transparency in disclosing debt-related matters. This should be coupled with prudence in addressing the current emergency obligations, exemplified by the proposi-

tion to establish a sovereign fund that deduces a portion of public sector revenues, transferring them to banks instead of losses incurred from investments in Treasury bonds. Similarly, there should be a concerted effort to address the rentier policy and inefficiencies in electricity financing that have persisted since the 1990s. These details, which remained obscured and entwined with poor cost recovery, have become enduring burdens for successive administrations.

Thirdly: Evasion of "Fiscal Policy Domination" and Mitigating Overreliance on the Central Bank

Lebanon offers a striking example of fiscal policy dominance, as evidenced by the sustained approach of financing budget deficits and government debt through the expansion of the money supply, essentially through printing money by the central bank. While public debt typically remains manageable and controlled through a combination of economic growth and taxation during normal conditions, this situation becomes precarious due to shocks and misguided policies that have escalated debt to unsustainable levels. Consequently, over-dependence on the central bank has ensued, leading to concerns over its ability to maintain stability.

This circumstance is further exacerbated by the depletion of foreign exchange reserves, hindering its capacity to manage currency systems, stabilize the banking sector, and ensure inflation control. In light of these concerns, the central bank's tools have become insufficient and infeasible, particularly if it becomes the sole resort for lending to governments when foreign exchange reserves rapidly diminish.

To avert this precarious scenario, the government, represented by the Ministry of Finance as the custodian of fiscal policy, must collaborate urgently with the central bank, representing monetary policy. This joint effort is crucial to implement structural reforms addressing the fragile state of public finances. The limitations of the central bank's mechanisms, in isolation, necessitate the swift pursuit of these reforms, especially in light of the imperative to arrest the ongoing deterioration.

## LIST OF ABBREVIATIONS

IMF	=	International Monetary Fund
GDP	=	Gross Domestic Product
PINV	=	Private Investment

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