Revisiting Public Debt Sustainability During the COVID-19 Pandemic in India

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Abstract

Purpose : The present study aimed to assess the impact of COVID-19 on public debt sustainability through a systematic literature review of prolific international studies and an evaluation of the trends of debt, deficit, and spending indicators over the past years.

Methodology : Fourteen studies were systematically reviewed, and special attention was paid to the policy implications they suggested. The study also used data from secondary sources to unravel the trends of various fiscal indicators of the Indian economy for the period from 1982–1983 to 2020–2021. Furthermore, unit root and Johansen's co-integration tests were employed to assess public debt sustainability.

Findings : The review of studies revealed the significance of the policies aimed at reduction in debt servicing and expenditure, debt restructuring, maintenance of a rainy day fund, and market-financed public investment plan. The combined government finances depicted that the government's fiscal position was unhealthy even before the pandemic, further aggravated by the latter.

Practical Implications : The present research provided valuable insights for the policymakers and the government to manage the fiscal health of the economy through various policy measures, namely, judicious resource utilization, structural changes in revenue and expenditure policies, and a flexible fiscal framework.

Originality : The present study provided a dual assessment of the impact of COVID-19 on public debt sustainability in India, given the scarce literature concerning the same.

Keywords : **public debt sustainability, debt-GDP ratio, COVID-19, systematic literature review, economic growth**

JEL Classification Codes : H11, H20, H30, H50, H61, H62

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Macroeconomic analysis suggests that a responsible fiscal strategy is essential to developing countries' ability to have steady economic growth. It is employed as a weapon to boost aggregate demand in the economy in addition to reducing output and employment swings. Extensive literature exhibiting the relationship and impact of various fiscal parameters on economic growth highlights this domain's importance, especially in developing countries. According to Mohanty and Mishra (2017), the Fiscal Responsibility and Budget Management (FRBM) Act, which was implemented on July 5, 2004, is the policy product of the same agenda. In the case of the Indian economy, adherence to fiscal rules and fiscal policy aims has been the primary point (agenda). Various targets concerning fiscal deficit, revenue deficits, and government borrowings as a percentage of gross domestic product (GDP) are set annually under this act. However, due to the global financial

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crisis, structural adjustment programs, the adoption of the Goods and Services Tax (GST) and value-added tax (VAT) shifting policy measures, and a few economic slowdowns, it has been unable to meet the targets of the FRBM Act (Bhashkar, 2020). Additionally, the poor performance of macroeconomic parameters has led to amendments to FRBM Act targets, and an FRBM review committee was set up in 2016–2017 to assess the functionality of the FRBM. The government has already missed its goals despite changes to the original FRBM Act, and COVID-19 has now significantly weakened the government's financial position.

The COVID-19 pandemic has resulted in a significant increase in government spending, and during times of economic downturn, this spending could cause borrowing or hyperinflation, which would further obstruct economic growth. Ultimately, there will be a fiscal imbalance in the economy, and the burden for such adjustments will fall on the government. Though it is a difficult task, balancing fiscal prudence and mandating the same is the key to stable macroeconomic behavior. As such, evaluating the status of the economy and the effects of COVID-19 are critical. However, compared to studies carried out in European nations, there is a dearth of research on this subject in the setting of India (Amato et al., 2021; Briceño & Perote, 2020; Creel, 2020; Della Posta et al., 2020; Gurinovich & Smirnikova, 2021).

The present study will cover this gap in the literature and attempt to provide a dual assessment of the impact of COVID-19 on fiscal health and public debt sustainability. First, a systematic review of prolific international studies has been performed with their policy implications at focus. Second, an empirical assessment of India's prudent fiscal policy based on two essential elements, namely revenue-enhancing measures and expenditure commitments, has been done. The study evaluates the behavior of various fiscal parameters, namely debt to GDP ratio, gross fiscal deficit, revenue deficit, primary deficit, expenditure and revenue pattern, interest payments pattern, and tax and non-tax revenue to GDP ratios, to comprehend the fiscal health of the government. In addition, the sustainability of public debt has been evaluated using the unit root and Johansen's co-integration test.

Systematic Literature Review

According to Briceño and Perote (2020), COVID-19 has affected public finance, healthcare, and social security systems globally. The decline in birth weight life expectancy has led to higher hospital, pension, and healthcare costs. Besides this, there has been enhanced spending on research and development and innovations. The econometric assessment revealed that a point rise in economic growth resulted in a point fall in the public debt ratio, and the contraction was higher for some countries. The relationship between interest rate and debt ratio was also positive and significant.

Furthermore, a 0.10% rise in the public debt ratio has been brought by a 1% rise in the unemployment rate. Creel (2020) discovered that COVID-19 has made the issue worse while evaluating the ability of euro area members to repay their debt using computer simulations of 12 distinct scenarios. The only option, according to the author, to restore the situation to its pre-COVID median would be to reduce interest rates and accelerate economic development. In the absence of such provisions, even countries such as Germany will be unable to preserve a stable debt-to-GDP proportion. The stability of their debt was a concern for every member state, save for Malta, Cyprus, and Luxembourg.

Della Posta et al. (2020) conducted additional research centered on the Eurozone and examined the issue of public debt-to-GDP volatility. The study suggested a market-financed public investment plan that, according to simulations, would stabilize the interest rate and have favorable short- and long-term consequences. By supporting OVI changes in the European Monetary Union, we claimed that this plan would improve the European Union's prospects of surviving, and COVID-19 has further strengthened the significance of this strategy. Gebhardt and Siemers (2020) also discovered that Germany's fiscal situation was remarkably robust in the 2010s and that the nation's public debt ratio has been below 60% since 2012. However, the situation changed

dramatically after COVID-19. It has caused the highest fiscal deficit in history, with a debt ratio of 77.5% in 2020. It is contended that this calls for budget consolidation as there would be a significant rise in age-related spending and additional payments leading to interest rate reversal necessitating curtailment of primary expenditure.

As stated by Amato et al. (2021), COVID-19 has forced the world's economies to review public expenditure management rules. This study outlined an operating framework of a debt agency dealing with European sovereign assets and developing a common bond. The agency could structurally filter out the liquidity risk by pricing the funding cost only on the credit risk, and this framework can act as a benchmark for other political and institutional decisions. The common bond of the debt agency can be bought directly by the European Central Bank as this bond is designed to exclude mutualization. Bezemer (2021) evaluated the basic changes in the economy brought about by COVID-19 and discovered that, in the first place, it had initiated structural changes and, in the second place, it had changed public opinion. Elevated levels of private and public debts call for the restructuring of financing systems. The study identified six changes, namely upgraded information and communication technology, urban transport system, work from home, localized production, and improvement in the aviation and energy sector, which created opportunities for sustainability.

We were given conflicting information by Burger and Calitz's (2021) assessment of South Africa's financial situation. According to the authors, spending can only stimulate economic growth in the short term, and at the moment, the ratio of spending to GDP is higher than what has a favorable impact on growth rates. A Markov-switching model was used to investigate the impact of previous government initiatives using a fiscal reaction function. According to the report, in order to restore fiscal sustainability, the government should modify the deficit, revenue, and expenditure.

Butkus et al. (2021) provided empirical evidence relating to the heterogeneous nature of debt and growth based on a panel data analysis of a group of countries with different expenditure multipliers. We emphasized that COVID-19 had given impetuous to the debate on the sustainability of public debt, and the school of thought supporting the non-linear nature of the debt-growth relationship has become dominant over time. This study tested the hypothesis that public expenditure influences the effect of debt on output growth. It was found that when the level of expenditure multiplier is lower, there is a significant negative impact of public debt on output growth. It points toward a heterogeneous relationship between debt and growth. Thus, the study concluded that countries manifesting a high level of expenditure multiplier could sustain growth at high debt levels, while those with a low expenditure multiplier cannot sustain growth even at low debt levels.

Additionally, Dunz et al. (2021) assessed the impact of natural disasters such as hurricanes and COVID-19 on the Mexican economy using the ERIN stock-flow consistent model. Using compound risk indicators, the study evaluated the government's recovery strategies and the loan decisions made by banks and discovered that Mexico was highly vulnerable to COVID-19 and hurricane risk. The pro-cycle lending and constraints of the credit market multiplied the magnitude of the initial stock by constraining the recovery investment of the firms and public expenditure. Also, the pandemic has led to non-linear dynamics, which increases the losses by negatively affecting the recovery process.

Kireyev and Ferrer (2021) conducted a novel study in which they computed the nominal policy space index to assess the economic measures used by different economies in reaction to the pandemic. This index is a sum of each country's fiscal, reserve, and monetary space and is adjusted for institutional features of countries to derive an index called the Effective Policy Space Index. The results showed that about 95 countries have little policy space and require assistance in a pandemic scenario. Liao et al. (2021) examined the implications of budgetary measures such as special budgets, bailouts, and economic packages undertaken by the Taiwanese government during the COVID-19 pandemic. Using information from news articles and government records, the authors contrasted the current special budget with one that was proposed in 2008–2009, during the height of the Great Recession. It was found that the 2008–2009 budget focused primarily on economic incentives, while the COVID-19 special budget

also emphasized medical treatments and bailouts along with economic stimulus. The government had created triple stimulus vouchers and targeted bailout plans for those worst hit by pandemics. However, there have been rising concerns about intergenerational equity and fiscal sustainability.

Furthermore, Mennini et al. (2021) investigated the impact of early versus late vaccination policy adoption on Italy's GDP recovery. The study employed a knowledge management technique along with an epidemiological model to assess the effect of time on the healing rate. It was predicated on quarterly time shift estimations that were derived from the anticipated timing of the immunization schedule's acceleration or delay. It was found that the best scenario would be optimal vaccination coverage (62–75%) in the second and third quarters of 2021, which would lead to a small growth of 4.7 billion in 2021 and 4.9 billion in 2022. Furthermore, Ramu (2021) conducted an empirical investigation into the sustainability of Karnataka's governmental debt from 1991 – 2018. To gauge the sustainability of the debt, it employed a time-series technique, sensitivity analysis, and indicator approach. The findings demonstrate that the state of Karnataka's debt satisfies Domar's (1944) sustainability requirements. The fiscal policy response function and unit root test substantiated that debt was sustainable, and the response function was significant and positive even when interest rate risk and growth rate were added in a sensitivity analysis that looked forward. The study also included a discussion of the pandemic corrective measures taken by the Karnataka government.

Furthermore, Schuknecht (2022) discussed the sharp increase in public spending and fiscal imbalances in COVID-19. The research asserted that this scenario has increased the concerns about the sustainability of public spending where, on the one hand, economists advocate interest-free debts, while facts point out it being a risky strategy, leading to very high public debt ratios. In order to improve economic growth and keep public finances sustainable, public expenditure can be cut and used more effectively.

Thus, the review of the literature highlights that evaluation of fiscal health is essential given the high public expenditure and debts incurred by governments during the pandemic. However, given the limited research focused on Indian fiscal health and public debt sustainability, the current study analyzes the same empirically in the forthcoming sections.

Database and Methodology

The present study is based on a systematic review of previous studies examining the impact of COVID-19 on public debt sustainability. The objective of a systematic literature review is to present an objective and thorough synthesis of the works that are relevant to a certain subject (Gordon et al., 2020). Although it has many similarities to the traditional literature review, it focuses on revealing all the evidence related to a research question with special emphasis on empirical studies rather than conceptual and theoretical studies (Munn et al., 2018). In this study, 14 papers have been methodically analyzed, with a particular focus on the policy implications they reveal. It would make it possible for us to describe the further steps that could be taken to put India back on the path of debt sustainability.

The study also uses secondary sources, namely *Handbook of Statistics 2020–21* (Reserve Bank of India, 2021) and the *Economic Survey of India 2020–2021* (Government of India (GOI), 2021), to unravel the trends of the Indian economy concerning debt indicators, deficit indicators, and indicators depicting spending patterns over the past years. The trends of outstanding debt/GDP ratios have been analyzed to address the issue of debt sustainability. However, debt sustainability can be analyzed using econometric techniques, namely unit root analysis and cointegration analysis, as public finance data is usually time-series data involving trends. Trehan and Walsh (1991) proposed testing the sustainability of the first difference of stock of public debt as the following hypotheses:

- **H_0:** Non-stationary (Unsustainable).
- **H_1:** Data stationary.

If H_0 is rejected, the process is stationary, and then the sustainability hypothesis may be accepted. However, if not rejected, it implies that sustainability is in trouble.

For the present study, the debt sustainability has been worked out by following the indicators approach and also carrying out unit root test, Augmented Dickey–Fuller (ADF) test, and the Philips–Perron (PP) test (Phillips & Perron, 1988). The ADF test is conducted by adding the lagged values of the dependent variable, and it consists of estimating the regression equation as follows:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-1} + \varepsilon_t \qquad (1)$$

Hakkio and Rush (1991) developed an empirical approach for measuring sustainability through a cointegration test. If their first difference is stationary, government revenue and expenditure must be cointegrated variables of order one. If revenue and expenditure are non-stationary, the first difference should be calculated, and the series of revenue and expenditure should be $I(1)$. It involves the testing of cointegration regression as :

$$R_t = \beta_0 + \beta_1 G_t + u_t \qquad (2)$$

where R_t is government revenue, G_t is government expenditure, and u_t is the error term.

Here, the null hypothesis (H_0): No cointegration.

Alternative hypothesis (H_1): The series are cointegrated.

The empirical results may allow us to draw several conclusions as under:

- If there is no cointegration, debt is unsustainable.
- If there is cointegration with $b = 1$, debt is sustainable.
- Suppose there is cointegration with $b<1$. In that case, government expenditure is growing faster than revenues, and debt may not be sustainable, which implies that sustainable fiscal policy in a specific environment may become unsustainable under uncertainty.

Johansen's cointegration methodology has been applied to examine the long-term relationship between government revenues and receipts. To carry out the technique, first vector autoregression (VAR) is formulated, and then the hypothesis is tested by using the trace test and Max eigen test statistic as follows:

$$J_{trace} = -T \sum_{i=r+1}^{n} \ln(1 - \hat{\lambda}_i)$$

$$J_{max} = -T \ln(1 - \hat{\lambda}_{r+1}) \qquad (3) \text{ and } (4)$$

where, r is a canonical correlation, T is the sample size, $\hat{\lambda}_i$ is an i^{th} canonical correlation, and n is the number of cointegrating vectors.

For the present analysis, stationary properties of real stock of public debt have been tested. A number of studies have examined the discounted series of public debt (with a certain rate of interest), including Bohn (1998), Wilcox (1989), and Misra and Khundrakpam (2009). When testing sustainability, the discount component shouldn't be considered because the future interest rate is unpredictable (Tiwari, 2012).

Analysis and Results

According to Gupta and Bedarkar (2016), government spending has increased in light of planned development's significant role in the Indian economy. Due to resource scarcity and constraints on resource generation, the expenditure had to be met through borrowings (both domestic and external). Before the 1980s, the economy witnessed aligned growth of revenues and expenditure; however, since the 1980s, there has been a deterioration in revenue growth. For analyzing fiscal sustainability, the indicators of fiscal health can be classified into three major categories such as:

- Debt indicators (Outstanding liabilities/Gross state domestic product).
- Deficit indicators (Gross fiscal deficit/Gross domestic product and revenue deficit/Gross domestic product).
- Indicators depicting spending patterns.

The growth of revenues continued to remain sluggish than that of the expenditure, giving rise to borrowings. Consequently, both domestic and total liabilities of the government (combined) as a percentage of GDP have shown an increasing trend (Table 1). It is important to remember that, from 2018–2019 to 2019–2020, the ratio of outstanding liabilities to GDP increased by almost three percentage points, while the annual increase from 2015–2016 to 2018–2019 increased by about one percentage point. This recent pattern indicates the increased reliance of the government on borrowings. Increased government expenditure in the COVID-19 period has led to a rise in the debt-GDP ratio. The fiscal space of developing countries is much less than advanced countries. Lockdowns have also been much more severe in developing countries (Subramanian, 2021).

Table 1. ***Debt Indicators (Outstanding Liabilities/Gross Domestic Product)***

Debt Indicators (Center and State Combined) (As a percentage of GDP)		
Year (End-March)	**Combined Domestic Liabilities of Center and States**	**Combined Total Liabilities of Center and States**
1982–83	43.01	53.29
1985–86	49.35	60.51
1990–91	57.54	68.85
1995–96	55.18	67.28
2000–01	64.94	73.67
2005–06	73.82	79.07
2010–11	62.02	65.60
2015–16	65.58	68.53
2016–17	66.12	68.77
2017–18	66.97	69.80
2018–19	68.07	70.78
2019–20	70.84	73.72
2020–21	71.33	73.95

Source : Reserve Bank of India (2021).

Table 2. ***Deficit Indicators***

Combined Deficits of the Central and State Governments (As a percentage of GDP)		
Year	**Gross Fiscal Deficit**	**Revenue Deficit**
1982–83	5.7	0.2
1985–86	7.7	1.8
1990–91	9.1	4.1
1995–96	6.3	3.1
2000–01	9.2	6.4
2005–06	6.5	2.7
2009–10	9.3	5.7
2015–16	6.9	2.5
2016–17	6.9	2.3
2017–18	5.8	2.7
2018–19	5.8	2.5
2019–20	6.9	3.1
2020–21	6.3	2.7

Source : Reserve Bank of India (2021).

Even if the extraordinary COVID-19 scenario requires excess spending for the benefit of public health, it must be paid back either by borrowing money or by creating new money (Table 2). The long-term effects of both will result in inflation, selling off public assets, or increased taxation. All these outcomes have a further negative impact on aggregate supply and macroeconomic stability. As stated by the former Chief Economic Advisor (CEA), the fiscal space of developing countries is much less than that of advanced countries; thus, India cannot dare to run enormous deficits ("COVID-19: FRBM framework will need," 2020).

If the servicing of the debt does not impose an unbearable burden on debt, it is referred to as sustainable and tolerable. When interest payment (IP) is one-fifth of revenue receipts, it is a tolerable ratio of the interest burden (Dholakia et al., 2004). Table 3 demonstrates the serious burden that debt servicing has on the government's ability to maintain its financial stability. Additionally, a sizable amount of capital income from borrowings goes toward paying for revenue expenditures. The diversion of resources toward current expenditure leads to a vicious circle as interest payments constitute a sizeable portion of revenue expenditure. It does not contribute to any capital formation in the economy. Due to the high-interest load that arises from larger borrowings, the government is compelled to take on new debt. Because of this, it creates a situation that resembles a debt trap, burdening government coffers and increasing borrowing costs due to rising interest rates and an increase in the need to borrow money to pay for debt servicing. The debt servicing charges generate no adequate returns and also do not contribute to asset generation. Thus, a high level of debt and its accompanying burden pose a major threat to the sustainability of public debt, which is already endangered by high revenue and fiscal deficits (Table 2). Moreover, a high level of public debt accumulation will also have a negative impact on economic development (Dash & Rath, 2016a; Dash & Rath, 2016b; Saini & Muniyoor, 2022).

The expense of interest payments has varied greatly throughout time, with a rising tendency when stated as a proportion of capital receipts (IP/CR). The ratio was quite high, having over 60% during the 2015–2016 period. Such an increase in the ratio depicts the proportion of capital receipts used for interest payments on past loans. Although a significant amount of the rise is ascribed to interest payments, inadequate capital receipts could also be

Table 3. ***Indicators Depicting Spending Pattern***

Year	RR	RE	CR	CE	IP	IP/RR	IP/CR
1983–84	17.37	18.34	8.41	8.31	2.46	14.14	29.23
1985–86	19.00	20.84	7.36	6.79	3.03	15.95	41.20
1990–91	18.36	22.50	8.07	5.88	4.34	23.63	53.77
1995–96	18.04	21.19	6.56	3.99	4.90	27.16	74.68
2000–01	17.70	24.19	10.30	3.64	5.83	32.95	56.65
2005–06	19.47	22.20	8.47	4.23	5.62	28.85	66.30
2010–11	20.68	23.94	7.53	4.15	4.57	22.08	60.65
2015–16	19.96	22.48	7.48	4.82	4.71	23.58	62.94
2016–17	20.35	22.67	7.51	5.05	4.71	23.13	62.66
2017–18	19.76	22.46	6.74	3.96	4.77	24.13	70.73
2018–19	20.11	22.61	6.49	4.08	4.74	23.55	72.98
2019–20	21.32	24.44	7.08	4.43	4.76	22.34	67.26
2020–21	24.45	27.54	8.59	5.23	5.53	22.61	64.35

Note. RR, RE, CR, CE, and IP represent revenue receipts, revenue expenditure, capital receipts, capital expenditure, and interest payments as a percentage of GDP, respectively. IP/RR is the ratio of interest payments to revenue receipts, IP/CR is the ratio of interest payments to capital receipts.

to blame. Debt and non-debt capital revenues are the two main forms of capital receipts, with the former accounting for a somewhat larger portion of total capital receipts. As a result, a government that has large deficits, high-interest costs, and poor capital gains will be caught in a debt trap. To cover its past debt servicing obligations, it appears to be borrowing more money.

When the debt stock of any government is found to be unsustainable, it becomes challenging to come back on the sustainable path as further lending to such government may be ceased, and thus, there is a fear of a debt trap (Liji Lakshmanan, 2019). As a result, an effort has been made to examine it empirically using methods from science. Tables 4 and 5 present the results of the unit root and cointegration tests, respectively. The results of the unit root tests indicate that the null hypothesis of a unit root could not be rejected at a 1% significance level.

Table 4. ***Unit Root Test Results***

Unit Root Test	Debt-GDP	1 % level	5 % level
ADP	–3.531	–3.627	–2.946
PP	–3.463	–3.626	–2.946

Table 5. ***Johansen's Cointegration Test***

Johansen's Test (Trace Statistic)			
Null Hypothesis	**Trace Statistic**	**Critical Value (at %)**	***p*-value**
$H_0 : r = 0$	24.582	15.947	0.0016
Johansen's Test (Max-Eigenvalue Statistic)			
Null Hypothesis	**Max-Eigenvalue**	**Critical Value (at %)**	***p*-value**
$H_0 : r = 0$	14.054	14.264	0.0539

However, at 5%, the debt-GDP series becomes stationary and satisfies the weak sustainability condition. Since the series is non-stationary at a 1% level of significance, it may be inferred that the combined debt position is unsustainable under the strong sustainability condition.

To assess the sustainability of Indian public debt, we adopted the concept of testing the cointegration of revenue and expenditure series if they follow an *I*(1) process. As a first step, we began by ascertaining the degree of integration for revenue and expenditure series in each case. Since all the series are *I*(1), we tested them for cointegration. The findings show that Table 5 illustrates the government's long-term link between revenue and expenditure, showing sustainable debts in terms of trace statistics. However, there is a contradiction in the case of max-eigenvalue statistics. Thus, it can be inferred that the strength of sustainability is weak.

Policies that reduce spending and policies that increase revenue could be the two rescue measures to keep the economy's fiscal discipline. That being said, the lockdown's effects were so great that cutting back on government spending was not an option. Also, such expenditure was inevitable, but during times of declining growth, increasing inflation, and declining production activity and employment, it has become impossible to look up to fiscal prudence or discipline, at least for the time being. Thus, the recovery of economic growth ought to be prioritized. Keynes believed that stimulating aggregate demand was necessary to raise the economy's total income. Therefore, creating demand is a critical component of the economy's current recovery. However, public spending is essential for creating demand, and its benefits won't materialize until they stifle private investment. The CEA notes that the government's policy reaction to COVID-19 was justified economically by stating that increasing private investment would boost productivity and that aggregate supply would promote economic growth without fostering inflationary tendencies.

On the other hand, eliminating fiscal restraint does not follow from a direct fiscal intervention that boosts aggregate demand. One major element affecting growth, inflation, and price stability is the fiscal imbalance. However, the new structure for fiscal legislation ought to focus on a single goal.

Discussion

Several policy solutions have been suggested by the studies systematically reviewed in this research. Briceño and Perote (2020) implied that as the Euro governments are unable to pay high debt services, they should at least follow debt restructuring policies. Creel (2020) asserted that the reduction in fiscal space and debt sustainability due to the primary deficit also leads to a feedback effect on GDP. This effect may result in an increase in tax receipts in the future and a decrease in public spending, thus leading to debt sustainability. Della Posta et al. (2020) proposed an investment plan that could increase the GDP growth rate, thereby improving the financial condition of the Euro area countries. This plan would ensure the stability of the public debt by relaxing the constraints on primary surplus and by maintaining a sustainable interest rate. Gebhardt and Siemers (2020) stressed the need to curtail certain excess expenditures, such as health and related expenditures, which had increased during the pandemic. According to Amato et al. (2021), it is more structurally safe to have a joint debt market agency than individual sovereign markets. The capacity of the European Central Bank to bring the bond yield rate of the debt agency to a nominal rate can work out only till the agency can completely absorb the member countries' debt. Bezemer (2021) claimed that the government's choices about taxes, investment, and regulation will create ground for eco-friendly economic growth and the creation of employment opportunities along with ensuring financial, social, and ecological sustainability. Burger and Calitz (2021) contended that the debt/GDP can be stabilized by achieving a real output growth rate of more than 2.5% and a decrease in the government's salary bill by 3.5%. This could be done through wage freezes, early retirement, and voluntary and involuntary severance. Butkus et al. (2021) focused on the magnitude of the expenditure multiplier to solve the debt problem. According to Dunz et al. (2021), government spending played a crucial role in the recovery of the Mexican economy during the

post-COVID-19 period. Proper coordination of the fiscal and monetary policy is instrumental in strengthening the effect of government expenditure on economic recovery.

Kireyev and Ferrer (2021) proposed an index to capture a country's readiness for catastrophic events such as COVID-19. It can help policymakers assess the overall magnitude of policy space and guide them in ways to strengthen it by examining the policy options available to the government. Liao et al. (2021) propounded that the government should consider setting up a rainy-day fund to enable timely government response in case of emergencies like COVID-19. A sustainable debt repayment plan needs to lower the debt levels by curtailing unnecessary budget items, thus allowing for more flexibility in issuing new debt. Mennini et al. (2021) suggested coordination between knowledge management, science, and government policies for controlling COVID-19 and reviving the economies. Ramu (2021) claimed that adhering to the fiscal consolidation guidelines would help Karnataka state achieve a sustainable debt position. Furthermore, an excellent primary balance can be achieved by regulating excess expenditure and increasing output growth. Schuknecht (2022) contended that prudent primary balance and sustainable debt levels are the keys to controlling excess public expenditure and achieving a high output growth rate.

Implications

Theoretical Implications

Given the paucity of literature concerning the influence of COVID-19 on the fiscal health of India, the study makes dual efforts to address the same. First, it presents a systematic review of significant studies focusing on COVID-19 and public debt sustainability. The evaluation of these prolific international studies enabled the exploration of various policy initiatives undertaken in different countries in response to the derogatory impact of COVID-19 on fiscal health and public debt sustainability. Second, an empirical evaluation of India's debt, deficit, and spending indicators has been performed for the period from 1982–1983 to 2020–2021. Furthermore, unit root and Johansen's co-integration test have been employed to assess public debt sustainability.

Practical Implications

The systematic review of studies has revealed significant policy measures to come out of the crisis are almost similar for the majority of the economies. The emphasis was placed on reduction in debt servicing and expenditure, debt restructuring, maintenance of a rainy day fund, and market-financed public investment plan. Concerning the empirical analysis undertaken in this research, there are no internationally established thresholds to assess sustainability. The capacity of the government to pay off its debt has always been a factor. Therefore, an analysis of sustainability has been conducted using these indicators. However, the answer to this problem lies in Domar's sustainability framework. According to Domar's (1994) model, there are two ways to guarantee debt sustainability: A primary surplus (fiscal balance net of interest payments) or an output growth rate that is faster than the cost of borrowing. The first ordered series of public debt, government expenditure, and government revenues were stationary through the unit root (ADF and PP tests) and cointegration analysis (Johansen's cointegration test). It was also determined that these aggregates had a long-run equilibrium relationship. However, the spending and deficit metrics told a different tale and exposed the inadequate fiscal restraint for the combined public finances.

Furthermore, it is essential to understand that the position of government finances was not healthy even before the pandemic, and the latter further aggravated it. Therefore, as mentioned earlier, a flexible fiscal framework must be adopted. The new framework requires a single mandate as a guiding force for fiscal policy rather than

having multiple target settings for fiscal parameters such as fiscal deficits, revenue deficits, and public debt. The framework should be adaptable enough to guarantee sustainability at the same time as opposed to aiming for a particular ratio. Kubendran (2018) suggested that in order to foster economic growth and stability, the government should exercise caution while implementing expansionary fiscal policy and prioritize budgetary discipline.

Limitations of the Study and Scope for Further Research

We have made an honest effort to assess how the situation has unraveled in India's fiscal sector during the global pandemic. The research does, however, have certain shortcomings. Initially, the article solely provides a brief overview. Long-term consequences are inevitable for a pandemic of this magnitude that has affected every area of the world economy. Also, the pandemic can make a rebound in the forthcoming years as well, thus providing an assessment based on data from one or two years after the arrival of the pandemic is short-term only. Second, unit root tests also suffer some limitations concerning unreliable results in the case of small samples, assumption of linearity of data, and spurious regression results. Future studies can evaluate relatively long-term effects by using data from the coming years. Moreover, the fiscal health of various states can be assessed to comprehend how COVID-19 has impacted state finances. Also, inter-state comparisons can be undertaken.

Authors' Contribution

Dr. Amanpreet Kaur conceived the idea and developed the design to undertake the empirical study. Prabhjot Kaur extracted research papers with high reputation, filtered these based on keywords and conducted a systematic literature review. Dr. Amanpreet Kaur carried out mathematical calculations and data extraction. The manuscript was co-written by both authors.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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