THE IMPACT OF GOVERNMENT EXPENDITURE ON GOVERNMENT DEBT FOR G20 ECONOMIES

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ABSTRACT

This paper carefully examines the effect government expenditure has on government debt using time series data for G20 economies from the past 20 years. A regression model is estimated to study the impact of government expenditure on government debt, taking into account necessary control variables. The results show that government expenditure has a significant impact on government debt. The results provide useful policy implications for the G20 economies by suggesting mechanisms by which government expenditure can be effectively leveraged to mitigate government debt.

Research Question: Does Government Expenditure Effect Government Debt? Evidence From G20 Economies

Introduction

Government expenditure is an integral part of an economy's growth. It consists of expenditureon revenue generating as well as social activities. Government expenditure in developed countries tends to be much larger than developing countries. In developed countries like the United States, government expenditure consists of 42.36% (IMF 2021[1]) of Gross Domestic Product (GDP) whereas in developing countries like India, it consists of 30.14% (IMF 2021[2]) of GDP. Therefore, among both developed and developing countries, government expenditure plays an important role in an economy's growth.

While a large part of government expenditure in developed countries is spent on economic infrastructure, in developing countries the focus is more on socio-economic indicators such as health and education. One indicator directly affected by government expenditure is government

[1] https://www.imf.org/external/datamapper/exp@FPP/USA
[2] https://www.imf.org/external/datamapper/exp@FPP/IND

debt. Debt is calculated as the sum of the following liability categories: currency and deposits; debt securities, loans; insurance, pensions and standardized guarantee schemes, and other accounts payable (OECD 2023[3]). Most countries finance their government expenditure through debt instruments such as bonds which enables them to borrow large sums of money for massive infrastructure and welfare projects. Therefore, it is important to examine the relationship between government expenditure and debt. In recent years, public debt has increased rapidly across a broad range of countries. In 2015, average government debt to GDP percentage of advanced G20 economies was 91.5% (IMF 2015[4]) whereas that of emerging economies was 46.35% (IMF 2015[5]). Some countries have very high debt to GDP (USA, Japan, Italy) while some have low debt to GDP (India, China, Russia). Government expenditure can also be financed through own tax revenue, thereby being less reliant on external debt.

Therefore, the effect of government expenditure on government debt remains ambiguous.

Against this background, this paper seeks to examine the relationship between government expenditure and government debt. This paper studies the relationship across the G20 economies. It is important to study this for G20 economies as we are better able to understand how this takes place in both developed and developing countries. Together, the G20 countries account for about two thirds of world population, 75% of international trade and 85% of the global GDP (OECD[6]). Therefore, these countries will help us explain how the two economic indicators are linked among both developed and developing countries.

The results of this paper show that government expenditure has a significant and positive association with government debt for the G20 countries. The major contribution of this paper is the extension of the research on government expenditure and government debt on a wider mix of countries such as G20 economies as well as by incorporating recent events such as Covid-19 and other economic shocks on the relationship between the two variables.

Literature Review

This section examines the extant research that is related to our research topic. There is a large body of literature discussing the relation between government expenditure and government debt across various countries.

Turnovsky and Fisher (1995) examines the effect of government expenditure on growth, productivity, and overall economic welfare as an aftermath of economic shocks such as the Cold

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[3] https://data.oecd.org/gga/general-government-debt.htm
[4] https://www.imf.org/external/datamapper/DEBT1@DEBT/FAD_G20Adv
[5] https://www.imf.org/external/datamapper/DEBT1@DEBT/FAD_G20Emg
[6] https://www.oecd.org/g20/about/

War in the United States. It also dwells deeper into issues such as the role of government expenditure to help fluctuations in business cycles and to what extent does public expenditure crowd out private activity. They used an intemporal-optimizing market clearing framework and concluded that government activity, to some extent, does reduce resources available to the private sector.

Turnovsky (1996) expands on the relationship between government expenditure, tax on returns to assets, public debt, and growth in an endogenous growth model. They suggest that consumption tax plays an integral role as part of an optimum fiscal package. The major tradeoff between optimal income tax and consumption tax depends on externalities caused by government expenditure.

Hansen and Imrohoroglu (2016) studies how to measure the rapidly growing fiscal burden in form of additional taxes required to finance government expenditure and stabilize debt in Japan using a neoclassical growth model. It shows that due to Japan's societal aging problems, they would require additional revenue in the future which would increase the public debt even further. They conclude that to achieve fiscal sustainability, tax revenues would require large adjustments and suggest suitable policy measures.

Idenyi et al. (2016) investigate the causal relationship between public expenditure and public debt in Nigeria from 1980 to 2015. It suggests that an increase in deficit spending will also bring an increase in the amount of public debt. They aim to answer the question whether the government actually spends money for social welfare or only for privileged access to financial institutions, both domestically and internationally. Using the Vector error correction test, they conclude that there is a significant positive relationship between government expenditure and public debt in Nigeria.

Van et al. (2019) uses a neoclassical endogenous growth model to study the relationship between public investment, tax, public debt and growth. It focuses on two main questions- the impact of public investment and the financing modalities. Their analysis shows that a positive Balanced growth path in the economy can only exist if productivity is large enough and the tax rate is not so high.

Jibir and Aluthge (2019) examine the key components of government expenditure in Nigeria using data from 1970 to 2017. An autoregressive distributed lag model is used to support their findings. They suggest that the government's role has shifted significantly from traditional functions to a changemaker that works for societal welfare. They take into account other variables, which were previously not included, to conclude that oil revenue, GDP, population, trade openness, oil price, taxation and inflation also play an important role in the government

expenditure of Nigeria.

Monte and Pennachio (2020) study corruption, government expenditure and public debt for OECD countries over a period of 20 years from 1995 to 2015. They concluded that Government expenditure contributes to increased public debt but does not reinforce the damaging effect of corruption.

Iiyambo and Kaulihowa (2020) investigates the relationship between government expenditure, government revenue and public debt in Nigeria over the years from 1980 to 2018. They use an error correction model to show that government expenditure and government revenue go hand in hand. A similar relationship also exists between public debt and government expenditure.

They suggest that government debt is not a useful tool for government expenditure whereas the converse is true.

Awwad (2021) studies the effect of public debt on government expenditure in Palestine for the time period 1997 to 2019. They use an analytic descriptive approach to conclude that public debt positively impacts government expenditure. This also proves that the largest proportion of public debt is spent on the non-productive consumer aspects without direct concern for the elements of real economic production.

In summary, there seems to be a positive relationship between government expenditure and government debt across developed and developing countries. In addition, most studies have used a time series analysis to support the results.

Data

Data used in this paper was obtained from the World Bank Databank[7]. DataBank is a data repository that contains collections of time series data on a variety of economic indicators. This paper utilizes the world development indicators (WDI) database that has data on development indicators across countries. For this research we collect data for the G20 countries for two main economic variables mainly government expenditure and government debt. The independent variable in this paper is Government expenditure and the dependent variable is Government Debt. Control variables such as interest rate, inflation, and literacy rate have also been taken into account. Data for all these control variables has also been sourced from the WDI. Control variables account for any kind of cross-country heterogeneity that might exist in our data, thereby, isolating the effect of the key independent variable on the dependent variable. This paper uses data for the past 20 years from 2003 to 2022 which helps us to better understand the

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[7] https://databank.worldbank.org/source/world-development-indicators

changes during a wide array of economic shocks. In this paper, Government expenditure is defined as General government final consumption expenditure includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation (World Bank). Government Debt is defined as the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date. It includes domestic and foreign liabilities such as currency and money deposits, securities other than shares, and loans (World Bank).

Descriptive Statistics

Figure 1: Government expenditure as a percentage of GDP (2003 – 2022)
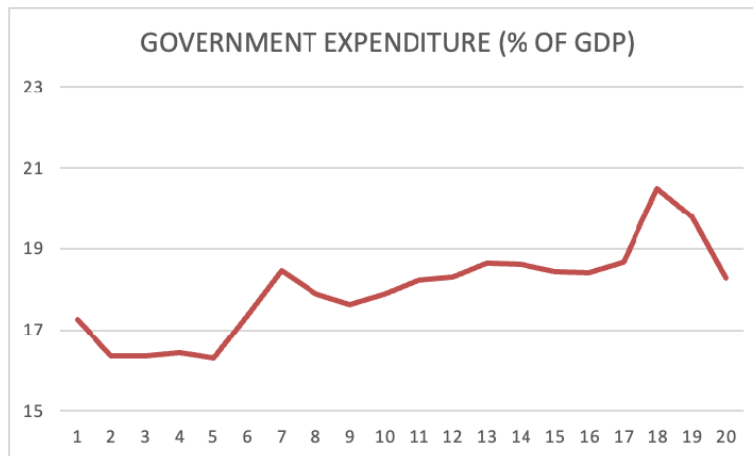

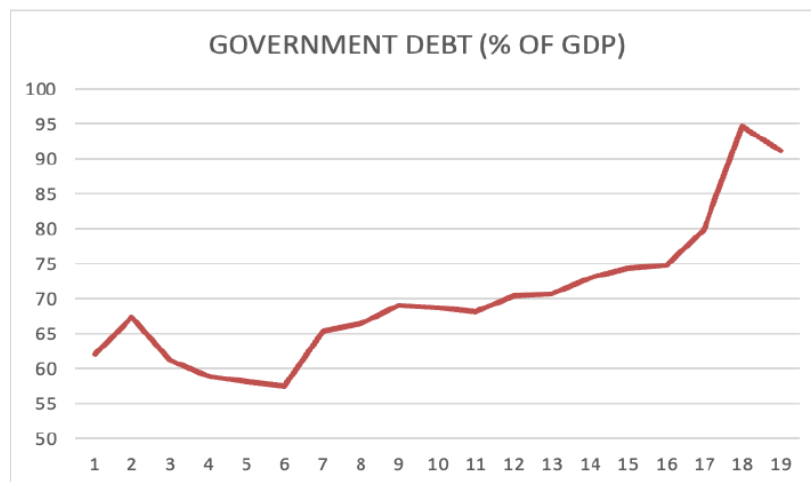**Figure 2: Government Debt as a percentage of GDP (2003-2022)**

Figure 1 illustrates the trend of government expenditure as a percentage of GDP from 2003 to 2022. The trend depicts that there has been a gradual increase in the government expenditure as a percentage of GDP from 17.2% in 2003 to 18.3% in 2022. The average for the 20 years is 17.9%. Therefore, the government expenditure has hovered around 17 to 18 percent for the G20 economies over the period.

Figure 2 illustrates the trend of government debt as a percentage of GDP from 2003 to 2022. The trend depicts that there has been a sharp increase in the government debt as a percentage of GDP from 62% in 2003 to 91.1% in 2022. The average government debt as a percentage of GDP over the period of time has been 70.1%.

Table 1 depicts the descriptive statistics over remaining control variables in our model.

Table 1: Descriptive Statistics of the variables in the study

CONTROL VARIABLE	MEAN	MINIMUM	MAXIMUM	NO. OF OBSERVATION
Interest Rate	11	67.3	0.5	251
Inflation	4.1	72.3	-2.1	338
Literacy Rate	93.2	99.7	62.8	89

Methodology

This paper uses a linear regression model to estimate the effect of Government expenditure on Government debt taking control variables into account. All assumptions for a regression are taken care of. The regression equation estimated as follows-

$$government\ debt\ =\ \alpha + \beta_1 * government\ expenditure\ + control\ variables\ + u_i$$

Our main variable of interest is β_1 which demonstrates the impact of government expenditure on government debt. We employ an ordinary least square (OLS) approach to estimate this equation.

Results

The results from the regression analysis are shown in Figure 3. The main variable β_1 (Government Expenditure) has a significant effect on government debt. A 1% increase in government expenditure approximately has a 2% positive change in government debt. In addition, inflation is positively and significantly associated with government debt. Lastly, there

isno relationship between interest rate and government debt. It can be inferred from the analysis that inflation has a positive effect on government debt. As inflation rates increase, government debt as a percentage to GDP increases. Inflation reduces the purchasing power of the currency, which leads to the weakening of the domestic currency leading to higher debt levels. These results point to the fact that G20 countries should invest more in capital expenditure which will generate positive returns, thereby, reducing future government debt.

Figure 3: Results of the effect of government expenditure on government debt

Source	SS	df	MS			
				Number of obs	=	158
				F(3, 154)	=	17.44
Model	77461.4891	3	25820.4964	Prob > F	=	0.0000
Residual	228022.138	154	1480.66323	R-squared	=	0.2536
				Adj R-squared	=	0.2390
Total	305483.627	157	1945.75559	Root MSE	=	38.479

GOVTDEBT	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
GOVTEXP	1.990636	.8292463	2.40	0.018	.3524699	3.628802
INTERESTRATE	-.063494	.3719804	-0.17	0.865	-.7983368	.6713489
INFLATION	-6.050643	1.196176	-5.06	0.000	-8.413674	-3.687612
_cons	54.43602	15.51917	3.51	0.001	23.7781	85.09395

Conclusion

This paper extends the research on the effect of government expenditure on government debt. The results of this paper show that government expenditure positively and significantly affects government debt. This means that government debt increases with increase in government expenditure for the G20 economies. Governments should start investing more in capital expenditure that will provide positive returns and ameliorate their debt burden. Reduction in debt burden will allow the borrowing countries to utilize their expenditure in more productive avenues.

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