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# FUNCTIONALITY BETWEEN ECONOMIC INDICATORS AND DEBT CRISIS OF AN ECONOMY: A CAUSAL STUDY ON PAKISTAN'S ECONOMY (2002-2017)

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## Abstract

The economy of Pakistan has been facing depressed economic conditions for several years since many years. Debt to GDP has marked its peak of Rs 21408.7 billion in 2017. The state of Pakistan has taken measures to reduce it. Various economic policies with amendments are being introduced by state authorities to create favorable economic conditions. However, there are still some factors that are creating economic instability in Pakistan, such as an increase in the public debt burden. So, this study primarily focuses on the exploration of a causal relationship between public debt and Pakistan's economic indicators. Secondarily, it focuses on analyzing the relationship between public debt and economic indicators such as market capitalization, reserves, exchange rate and fiscal deficits. The study employed both qualitative and quantitative type analysis. Quantitative data is analyzed through the statistical software EVIEWS. Sixteen years of data on Public Debt and economic indicators of Pakistan from 2002 to 2017 have been analyzed. Standardized criteria are adopted to accept or reject the hypothesis. Based on inferences, policies and implications are given in the shape of recommendations for corrective measures.

**Keywords:** Twin deficit, Debt Overhang situation, budget deficit, crowding out situation

## Introduction

The economy of Pakistan is facing a depressing and challenging situation. Due to the depressing economic conditions, the government of Pakistan and the State Bank of Pakistan are making amendments to make the economic conditions favorable for growth. However, some factors are still creating economic instability in Pakistan, such as an increase in the Public Debt Burden is one of them.

Pakistan's total debt reached Rs 21408.70 billion in 2017, including domestic and foreign debt. The government of Pakistan is facing fiscal deficits, and to finance this deficit, the government is taking additional debt. From 2012-2017, government debt has increased by 100%. The following graph presents the historical debt-to-GDP ratio of Pakistan's economy:

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Source: Trading economics.com: Central Bank of Pakistan

Studies reveal that from 2002 to 2017, Pakistan faced a decrease in investments due to a negative credit rating, the main reason behind this high credit profile of Pakistan's economy. The credit rating represents the degree of risk associated with investing in a specific country, including political risks. In the current scenario, MOODY gives a B3 rating to Pakistan's economy with a negative outlook. This debt overhang is also creating the worst situation for market capitalization in Pakistan because of the high liquidity and depreciation of PKR, creating repatriation problems for foreign investors as well.

Studies reveal Pakistan needs to pay back $1.2 billion to the IMF in 2012, including $230 million on account of interest payments, $2.9 billion during 2013, $4.3 billion during 2014, and $2.6 billion during 2015. The worst situation is yet to commence, as from 2017, Pakistan will have to start paying back the rescheduled $8.9 billion loan from the Paris Club. The immediate challenge before the new economic managers coming as a result of expected general elections would be how to arrange such heavy amounts to retire only the IMF debt. The government of Pakistan is further planning to borrow more money from the IMF to return the borrowed money, resulting in deep spending cuts and enhancement in tax rates, leading to high social unrest. In fact, Pakistan has been trapped in a Greece-like debt situation.

Fiscal and monetary policies are the tools for determining the growth of any country. Monetary policy includes money supply and interest rate, which the central bank of any country determines; in contrast, fiscal policy includes government revenues and expenditures, which the government of a country does. They both interact with one another. If one adopts a tight policy, another will adopt an expansionary policy to balance the economy, which directly impacts economic indicators such as GDP, inflation, etc. The level of the stock market is a key variable that indicates the pulse of economic activity in a country and together with other variables such as the real Gross Domestic Product, the unemployment rate, the inflation rate, the interest rate and the exchange rate, give a summary of the macroeconomy. The supply of money, the condition of credit and the price level influence the performance of the stock market over the short, medium and long-run periods.

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The debt to GDP ratio is the percentage of public debt over the gross domestic product of a country. A low debt-to-GDP ratio indicates an excess production to pay back the amount of debt. The government wants to maintain a low GDP ratio but also can face the risk of a high debt ratio if there is a chance of a high-profit margin on production.

Open market operation declarations to buying or selling government securities in the capital market. An increase in the Federal Reserve refers to the buying of bonds and t-bills from the public, which leads to an increase in money supply and the devaluation of home currency indirectly and, in the short run, influences interest rates, which helps to attract investment opportunities in the country and to pay debt repayment amount.

Michael Parkin reveals open market operation in his studies that When the FED buys securities in an open market operation, bank reserves increase, bank increase their lending, and the quantity of money increases and vice versa.

A high debt profile of a country requires high collateral for investors, while high debt-holding countries have a chance to become solvent in the future, so the debt amount of a country matters for investors of the same country. Two situations can occur due to high public debt: either the investor will flee from the country due to insolvency chances in the country, or the investors will have the opportunity to increase their capital because of highly demanded shares as compared to public bonds, bills, etc.

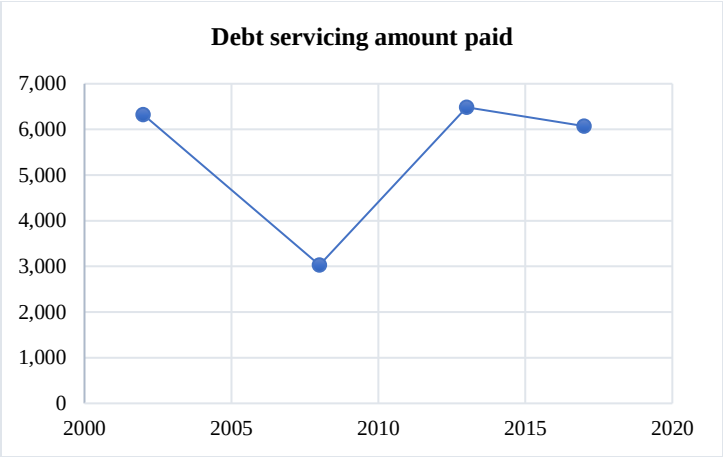
The exchange rate refers to the purchasing power of a home currency in another currency. Different factors influence the exchange rate, but sometimes, it is highly influenced by the amount of public debt, which is repaid at a higher interest rate and establishes demand and supply forces to determine a new exchange rate.

## Possible Outcomes of Public Debt

### Debt overhang situation

A situation in which an organization or government cannot borrow more money and has a positive NPV of future projects is not likely to flourish due to the existing amount of debt. When the amount of debt repayment becomes more than its principal amount, the Debt overhang condition can be developed in an economy. Dr. Ishrat Hussain (2017) pointed out the debt servicing profile of Pakistan’s economy in his research article and concluded that the amount of debt servicing from the IMF is to be paid in foreign exchange. Hence, the growing trend of interest rates is a major problem for paying back debt to debtors.

The following graph shows showing a trend of debt servicing in Pakistan, in which 2002-2008 is a declining phase while from 2008, it started to increase and now it would move towards a peak due to foreign debt burdens.



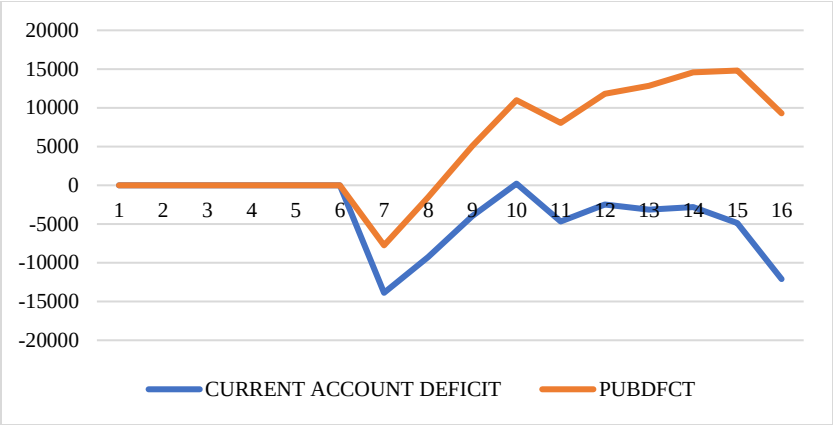

## Crowding out effect

The government faces deficits, and to finance deficits, the government starts borrowing at a high level, and the result is an increase in interest rate, which leads to a decrease in private consumption and investment. In other words, the "crowding out effect "refers to goods and services that are provided by the government and are offered by private investors. Privatization of SOEs is one of the examples of the crowding effect. In the eras of privatization, banking and the energy sector are at the top of the list. Muhammad Shahid, Mahmood Shah and Farhat Parveen (2016) quoted in their study that debt burden leads to an increase in taxes and a decrease in investment in the long run, prevailing crowding out effects in an economy.

## Twin deficits

Economies that have both a fiscal deficit and a current account deficit are often referred to as having "twin deficits. "Twin deficit refers to a situation when a country is facing a current account deficit as well as a budget deficit. When government spending becomes high as compared to revenues and the government takes debt to finance its deficits, this debt creates a high debt repayment outflow in the current account in the balance of trade; it is known as the twin deficit. Anjum Aqeel and Muhammad Nishat (2000) described that there is a linear relationship between budget deficit and tax rate, which would result in a decrease in national savings and an increase in the current account deficit. This phenomenon is called twin Deficit. As shown in the following graph of Pakistan's twin deficit trend that, there is a linearity between public debt and fiscal deficit.

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## Scope of Study

This study will be beneficial for:

- The government of Pakistan will develop strategies for debt management and focus on variables that are highly responsible for high public debt.
- State Bank will adopt policies that can create a favorable environment for the growth of the economy.
- Ministry of Finance to identify the sources of finance without affecting the economic health of Pakistan.
- Capital market to attract investors and borrowers.

## Purpose of Study

This study is conducted to determine the impact of the following on Public Debt of Pakistan from 2002-2017:

- Fiscal Deficit
- Exchange rate
- Market Capitalization
- Federal Reserves

## Literature Review

Mohammad Ishfaq (1999) published in The Pakistan Development Review 38:4 regarding fiscal deficit and debt dimensions of Pakistan; he stated that fiscal deficits and debt burden are causes and effects of each other. Mr.Parvez Hasan(1999) added in The Pakistan Development Review 38:4 regarding debt burden in different regimes, stating that the democratic government was struggling with debt burden and was unable to manage debt and fiscal deficits.

Asad Sayeed and Ejaz Rashid(2003) highlighted the causes and remedies of external debt burden; they stated that an increase in debt burden creates economic instability, which arises due to poor policies and decision-making of government, while Abdul Qayyum Khan(2008) published regarding budget deficits and its resources and stated that there is a relationship in budget deficits and foreign borrowings.

Benedict Clements, Rina Bhattacharya, and Toan Quoc Nguyen (2005) summarized for IMF regarding debt relief and economic growth of poor countries; they stated that the impact of debt on growth is greater when having positive effects on public investment and fiscal balances. On the other hand, Abid Hameed and Hammad Ashraf(2008) stated in the International Research Journal of Economics and Finance regarding external debt and its impact on economic growth in Pakistan; They stated that there is a long-run and short-term relationship between debt service and its impact on Economic and business growth of Pakistan. Cristina Checherita and Philipp Rother (2010) published in a working paper series of European Central Bank no.1237 regarding high govt debt and economic development of the country; they stated that there is a non-linear relationship between GDP and public debt.

Baïlo Diallo (2009) published regarding external debt and financing of economic growth; she stated that debt burden and economic slippages create economic instability in a country, which raises the chances of insolvency of the country and turns away financing and investing bodies from the government. Thomas Philippon (1999), in Jacques Polak Annual Research Conference (IMF) regarding the debt overhang situation in the country, stated that in a debt overhang situation, bank bonds can create positive NPV.

Muhammad Nadeem Qureshi (2010) published in the International Research Journal of Economics and Finance regarding the political instability and economic development of Pakistan. He stated that economic policies are made but not implemented properly due to irregular changes in govt and leaders.

Warren B. Hrung and Jason S. Seligman (2011) published in Federal Reserve Bank of New York Staff Reports, no. 481 regarding financial crisis and money market relationship, they stated that open market operation impact t.bills collateral and funding market stresses. Furthermore, Wilayat Shah elaborated in American Journal of Scientific Research ISSN 1450-223X Issue 49 (2012), pp. 113-130 © Euro Journals Publishing, Inc. 2012 named Effect of Federal Government Budget on the Stock Volatility of Karachi Stock Exchange regarding govt spending and revenues and their impact on stock market.

Mohammad Ayoub (2012) published in the Universal Journal of Management and Sciences regarding debt burden and its impact by examining debt policy statements from 1990 to 2000; he stated that the actual expenditures on debt services are the main causes of less productivity, unemployment and low contribution in the manufacturing sector.

Rebecca M. Nelson (2013), published in CRS report R41838 regarding sovereign debt, stated that an increase in government spending, a decrease in revenue and additional debt are the causes of high public debt. Shahid Hassan and Dr. Rukhsana

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Kalim published Pakistan's macroeconomic variables and fiscal deficits; they stated that fiscal deficit is the result of an increase in high external and internal debt to fill the gap in resources. Rifaqat Ali published the long-term impact of external debt accumulation and economic growth in the period of 1970-2010 and found that the long-term debt burden has created a debt overhang situation in Pakistan. External debt and labor force affect Pakistan negatively, while human capital and investment affect its economic growth positively.

## Methodology

### Data Collection Technique

There are two methods of collecting data: Primary and Secondary, but this study is totally based on Secondary data.

### Sources of Secondary Data

- Debt Policy Statements
- Articles, Journals and Publications
- State Bank of Pakistan’s annual records of trade and payments
- Financial market data from the State Bank of Pakistan
- Fiscal policy Statements

### Sample Size

The period from 2002-2017 is taken as a sample period because, in this era, different types of economic policies were introduced under different political regimes in the country, and there was an increment in public debt, which adversely affected the economy as well.

### Modeling Framework

### Econometric Model

$$Y= \beta_0+\beta_1 (\chi_1) +\beta_2 (\chi_2) +\ldots\ldots\ldots\ldots\ldots\ldots +\mu$$

### Model Driven

$$PUBDEBT=\beta_0+\beta_1 BDFCT+\beta_2 MC +\beta_3 RSRVS+ \beta_4 XRATE +\mu$$

Where,

PUBDEBT=Public Debt (Dependent variable)

FSDFT=Fiscal Deficit (Independent variable)

XRATE=Exchange rate (Independent variable)

MRCPT=Market Capitalization (Independent variable)

RSRVS=Total Reserves (Independent variable)

**Expected Signs**

- $\beta_0$=?
- $\beta_1$>0
- $\beta_2$<0
- $\beta_3$<0
- $\beta_4$<0

## Hypotheses

$H_{01}$: Budget deficit does not have an impact on public debt.

$H_1$: Budget deficit has an impact on public debt.

$H_{02}$: The Exchange rate does not have an impact on public debt.

$H_2$: Exchange rate gives impact on public debt.

$H_{03}$: Market capitalization does not have an impact on public debt.

$H_3$: Market capitalization has an impact on public debt.

$H_{04}$: Total reserves do not give impact on public debt.

$H_4$: Total reserves have an impact on public debt.

**Data Handling**

Data is handled through EVIEWS software by analyzing statistical tests:

**Statistical Tests**

- level of significance=95%
- Probability≤0.05
- Correlation
- T-test value>2

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## Results Estimation

## Descriptive Statistics Table

**Table 1: Descriptive Statistics**

| | FSDFT | MRCPT | PUBDEBT | RSRVS | XRTE |
|---|---|---|---|---|---|
| Mean | 5.387 | 3976265.00 | 9979.269 | 1.41E+10 | 79.171 |
| Median | 5.400 | 3403398.00 | 8368.500 | 1.36E+10 | 81.150 |
| Maximum | 8.800 | 9522358.00 | 21408.70 | 2.20E+10 | 104.697 |
| Minimum | 2.300 | 411576.00 | 3636.000 | 7.65E+09 | 57.574 |
| Std. Dev. | 1.763 | 2666499.00 | 6175.461 | 4.21E+09 | 18.96 |
| Skewness | 0.269 | 0.637930 | 0.532154 | 0.259 | 0.129 |
| Kurtosis | 2.504 | 2.371188 | 1.871250 | 2.105 | 1.356 |
| | | | | | |
| Jarque-Bera | 0.356 | 1.348816 | 1.604553 | 0.713 | 1.846 |
| Probability | 0.836 | 0.509 | 0.448 | 0.699 | 0.397 |
| | | | | | |
| Sum | 86.200 | 63620237 | 159668.3 | 2.25E+11 | 1266.745 |
| Sum Sq. Dev. | 46.637 | 1.07E+14 | 5.72E+08 | 2.66E+20 | 5396.082 |
| | | | | | |
| Observations | 16 | 16 | 16 | 16 | 16 |

The above table shows the mean, median, and standard deviation of each variable; the highest mean and standard deviation show the highest deviation in data.

## Correlation Matrix

| Table 2: Correlation Matrix | | | | | |
|---|---|---|---|---|---|
| | **FSDFT** | **MRCPT** | **PUBDEBT** | **RSRVS** | **XRTE** |
| FSDFT | 1.000 | 0.272 | 0.419 | -0.103 | 0.503 |
| MRCPT | 0.272 | 1.000 | 0.921 | 0.618 | 0.837 |
| PUBDEBT | 0.419 | 0.921 | 1.000 | 0.633 | 0.969 |
| RSRVS | -0.103 | 0.6180 | 0.633 | 1.000 | 0.598 |
| XRTE | 0.503 | 0.837 | 0.969 | 0.598 | 1.000 |

The data was analyzed through Eviews software by using correlation and regression. The correlation test indicates the relationship between the variables. According to the above table, there is a positive correlation between dependent and independent variables. Exchange rate and Market capitalization have a very strong correlation with public debt, while others are moderately correlated with public debt.

## Estimated Equation

| Table 3: Dependent Variable: PUBDEBT | | | | |
|---|---|---|---|---|
| Method: Least Squares | | | | |
| Date: 10/08/18 Time: 11:48 | | | | |
| Sample: 2002-2017 | | | | |
| Included observations: 16 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | -6934.319 | 26165.83 | -0.265 | 0.795 |
| LOG(RSRVS) | -142.020 | 1132.679 | -0.125 | 0.902 |
| LOG(FSDFT) | -621.812 | 1021.486 | -0.608 | 0.555 |
| MRCPT | 0.000814 | 0.000186 | 4.367 | 0.001 |
| XRTE | 227.371 | 31.64681 | 7.184 | 0.000 |
| R-squared | 0.980 | Mean dependent var | | 9979.269 |
| Adjusted R-squared | 0.973 | S.D. dependent var | | 6175.461 |
| S.E. of regression | 1000.366 | Akaike info criterion | | 16.904 |
| Sum squared resid | 11008045 | Schwarz criterion | | 17.145 |
| Log-likelihood | -130.235 | Hannan-Quinn criteria. | | 16.916 |
| F-statistic | 140.156 | Durbin-Watson stat | | 1.262 |
| Prob(F-statistic) | 0.000 | | | |

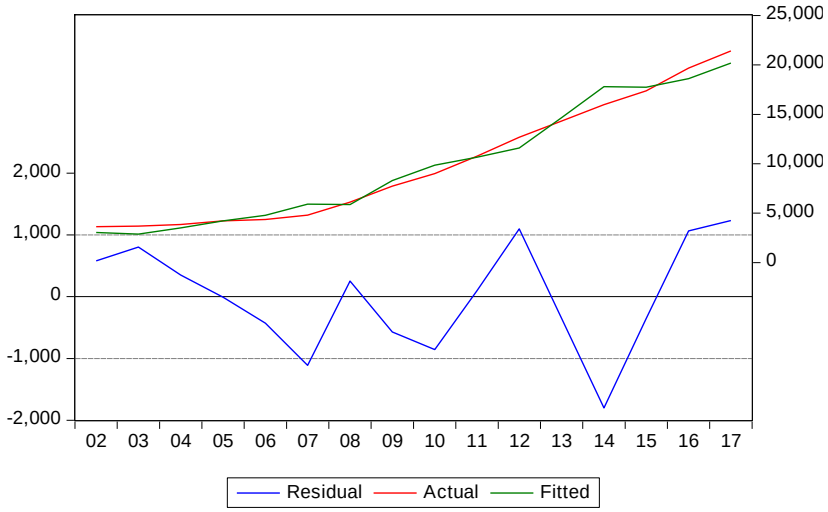
In the above equation, R Square shows the Coefficient of Determination defines the square of the Coefficient of Correlation. The R Square value (0.9807) means 98.07S% reliable to be used for estimation of population. The Std. Error is

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important because it reflects how much sampling Fluctuation a statistic will show. The R change shows the differences between the R-value & Adjusted R square.

Durbin Watson's test value lies in a significant region, which indicates that there is no autocorrelation in the samples. The F change shows the combination of all variables and the overall significance of the Model.

### Actual, Fitted, Residual Graph




The above graph shows the tracing of the model; the tracing of the model indicates minor errors in a model as adjusted R-squared indicated as well.

### Results and Analysis

**Table 4: Dependent Variable: PUBDEBT**

| Independent Variable | Coefficient | t-value | Prob. | Correlation. | Hypotheses Accepted/Rejected |
|---|---|---|---|---|---|
| FSDFT | -621.8126 | -0.608733 | 0.5551 | 0.419928 | $H_{01}$: Accepted |
| XRATE | 227.3712 | 7.184647 | 0.0000 | 0.969785 | $H_{02}$: Rejected |
| MC | 0.000814 | 4.367441 | 0.0011 | 0.921124 | $H_{03}$: Rejected |
| RSRVS | -142.0205 | -0.125385 | 0.9025 | 0.633816 | $H_{04}$: Accepted |

## Conclusion

Pakistan enters 2018 with Rs 21,408.70 billion in public debt and a fiscal deficit of 5.8 percent, with the dollar touching close to Rs104.62 Pakistan is at 40th rank in the world of high-debt countries, bearing 67.20% debt of GDP in 2017. Public Debt of Pakistan is creating debt overhang and crowding out situations in Pakistan, resulting in an increase in M2 and interest rates on borrowing, causing a decrease in

investment and consumption and to finance the budget deficit. The Government is taking additional debt. By going through this situation, some variables are deemed to be responsible factors behind this situation.

Since the last 12 years of debt financing have taken root in our economy and created the worst situation, this study was conducted to measure the variables that are the reasons behind the increase in public debt from 2002 to 2017. From the above analysis, it is shown that public debt is affected by market capitalization and exchange rate because the probability values of both are <0.05and t-test values are >2, are on the accepted region while not affected by fiscal deficit and reserves because the probability values of both are >0.05and t-test values are <2, are not on the accepted region. So, it can be concluded that the Results of the above research deny the secondary causes of increasing public debt, while primary causes have been found significant.

## Policies and Implications

- Pakistan's Debt to GDP ratio is at its peak, so the Govt should offer stock instead of issuing bonds to increase inflows free of interest expenses.
- Sustainable growth should be focused on investing in a field that should be free of environmental and financial risk.
- The central bank should cut interest rates on borrowing, which will enhance investment opportunities and production. Through high production, a balance of trade can achieve a surplus, and debt repayment would not disturb as much balance of payment.
- Government securities should be sold out to decrease the money supply.
- The State Bank of Pakistan should restrict debt amount for the Government and should adopt an expansionary monetary policy for private investors.
- The energy sector of SOEs is going down into deficits, which is also a source of expenditure for Pakistan's economy. Providing energy power plants at a lower rate can be a solution to overcome the shortage of energy and deficits.
- Rescheduling the debt would be beneficial for decreasing the debt burden from the balance of payment.

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