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Impact of Direct Taxes on GDP: A Study

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Abstract: *In the global scenario a country's performance is measured by its GDP rate and growth. GDP can be calculated on the basis of expenditure spent or income received or on the basis of how many products are manufactured. Gross Domestic Product of a country depends upon the economic activities, such as total market value of the goods and services produced by a country's economy during a specified period of time. It includes all final goods and services possessed by households, investors, Government and Exports –imports. At present, the GDP rate for the year 2016-17 is 11.52 %. (Statistics times)*

Taxation is the main source of revenue to the government. A country's standard of living is represented by per capita income. The country with higher per capita income is known for its economic progress. E-Filing of returns, rectifications, processing status and refunds for e-filed returns are the examples of advent of technology in collection of taxes. It has boosted the growth of GDP better than before. The present study aims to observe the impact of direct taxes contribution on GDP. Time series data from 2000-2016 is analyzed to assess the relation between the growth of GDP and Direct Taxes. Unit Root analysis, Heteroskedasticity test, Serial Correlation Test, Normality tests are conducted to examine the strength of the data. Ordinary Least Squares method is used to analyze the research Hypothesis. It was concluded that there is a significant impact of Direct taxes on the growth of GDP.

Keywords: *(Direct Taxes, GDP, Taxation, Long term growth)*

I. Introduction

Indian economy has developed in most magnificent manner. GDP acts as an indicator of economic growth of country. Gross Domestic Product represents the rise or fall in per capita income. Across the world GDP is calculated in different methods. There are three methods which are most commonly used to measure GDP. In the first method, expenditure approach, (GDP) is calculated on the basis of the expenditure. The total of expenditure spent by three major category of users i.e., customers, investors and Government is ascertained to know the value of GDP.

GDP = Consumption + Government Spending + Investment + Net Exports (Exports-Imports).

In the second method, GDP is defined on the basis of Income approach- is the country's total expenditure spent by the country should equal to the income generated by the country. Further, revenues of country must be excess than the expenditure of the country. Third approach says GDP is the monetary value of all goods and services produced in a specific period of time by a particular country.

In the income approach, the revenues of the country are measured to compute GDP. Taxes are the vital source of revenue to any government. They are known as compulsory charge or payment to meet the public expediency. Indian taxation system follows two different types . They are Direct taxes and Indirect Taxes. Direct taxes are personal or individual Income tax and Corporate Tax. Indirect taxes are sales tax, VAT, Customs, Excise and service tax. Present day all these taxes are brought under one ambit of Goods and Service tax. While designing the taxation structure, it has to be kept in mind that it should be in compliance to meet socio-economic objectives of the state.

Direct taxes are progressive in nature as they increase to the proportion of the income of individual and corporates. Indirect taxes are regressive in nature, dependent on economic activities of every person.

SECTORWISE CONTRIBUTION IN GDP

Contributories for GDP are classified into three sectors — Agriculture and allied, Industry and Services. On the global front GDP contributories share has been presented. (source: Statistics times).

Agriculture Sector: 6.1 percent share of total world's economic production is from Agricultural Sector. Total production of sector is $4,771,420 million. China and India are stands at top in contribution with 21.06 and 7.68 percent of total global agricultural output. Being the largest economy USA occupies third place. Apart from these countries, Brazil, Nigeria and Indonesia together shares 42.43 percent of total Agriculture in the GDP of the world.

Industry Sector: With GDP of $23.86 billion, A share of 30.5% of total GDP comes from Industry Sector. China stands at top in contribution of Highest share of Industry sector in total GDP followed by US. Japan stands in 3rd position and Germany stood at 4th place. In 21 countries the leading sector is Industry sector. Equatorial Guinea is in the first place with its share of 85.7% of their GDP. 13 countries hold more than 50% of their GDP from Industry.

Services Sector: Services sector is the largest sector of the world. Service sector holds 63.5 percent of total global wealth. United States stood at first position in producing of services sector with around 13.5 trillion USD. Services sector stands in top position in 194 countries. 30 countries receive more than 80 percent of their GDP from services sector.

Indian GDP composition in the year 2016-17 is, Industry 29.2%,Agriculture 17.32%, and Services 53.66%. Total production of agriculture sector is $366.92 billion. India stands in 2nd place in large production of agriculture product. India produces 7.68 percent of total global agricultural output. GDP of Industry sector is $495.62 billion and stood in 12th place in world rank. In Services sector, India holds 11th place in world and GDP is $1185.79 billion. Contribution of Agriculture sector in Indian economy is much higher than world's average (6.1%). Industry and Services sector's contribution is lower than world's average contribution of Industry and Service sector contribution .30.5% for Industry sector and 63.5% for Services sector.

II. Review of literature

Govind Rao (2000) carried out a study on tax reforms in India with the objective to analyze the tax reforms and the reasons for it. The study portrayed various tax models such as Optimal Tax model, Harberger Tax model etc. It was observed that after implementation of Tax Reforms Committee recommendations, government introduced Voluntary disclosure scheme, increase in the basic exemption limits. This was resulted in appreciable increases in personal and corporate income taxes. The study concluded that indirect tax rates should be rationalized into a maximum of two and tax credit should be provided on a systematic basis.

Magu(2010) studied about the impact of Direct and indirect taxes on the economic development of Kenya. The study revealed that there is inverse relationship between import duty and economic development, wherein direct relationship exists between Income tax and economic development. Increase in excise duty resulted in decline of economy.

Rajeswari and Susai (2014) observed the tax trends and GDP ratio through a study and discussed on origin and evolution of Income tax and other taxes. The study also observed the tax buoyancy factor. It was concluded that Tax-GDP ratio has grown consistently up to 2008-09. There was an impact of economic crisis on tax buoyancy which was enhanced in further years. However, the study established the fact that tax revenue share in GDP was only 15,5% which was lowest rate of all G20 nations. The study recommended mobilizing more direct tax revenue instead of indirect taxes. Indirect taxes affect haves and have-nots alike.

Subrahmanya and Urmi (2015) conducted a study on the various components of GDP with a special focus on direct and indirect taxes. The study considered the effects on economic growth. ARDL Bounds test approach is used to analyze the time series data to reveal co-integration between tax rates and GDP. It was established that in the short run customs duty had appositive impact on economic growth and excise duty has negative impact. Among the components of direct taxes, personal income tax had no impact on economic growth while corporate income tax had a positive statistically significant impact on economic growth in the long run.

Objectives of the study

The present study aims to assess the impact of direct taxes on Gross Domestic Product.

Hypothesis of the study

Ho: There is no impact of Net collection of Direct Taxes on GDP at Current Market Prices.

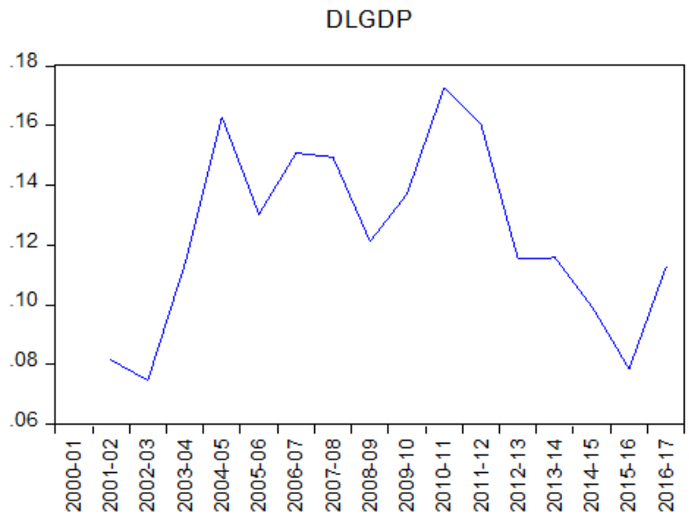
III. Methodology

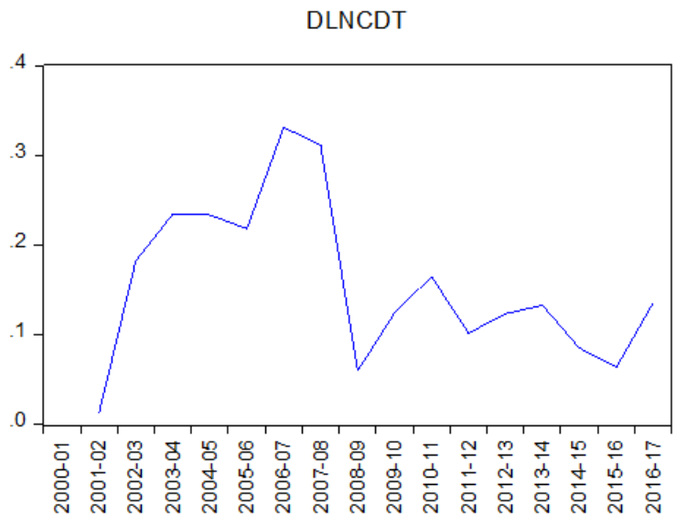
Time series data collected from Economic Survey 2016-17, relating to Net Collection of Direct Taxes and GDP in absolute terms for a period of (2000-2016)17 years. It has been analyzed by employing E-Views software. Unit Root analysis, Heteroskedasticity test, Normality tests are conducted to examine the strength of the data. Ordinary Least Squares method is used to analyze the research Hypothesis.

IV. Growth Of Direct Taxes & GDP

Direct taxes are the taxes which increase in proportion to the income of individuals and organizations or companies. Income tax is collected on the aggregate income earned by an individual from salaries, House property, business or profession, capital gains and income from other sources. Corporate taxes are paid by other category of business organizations such as companies, firms with respect to their income. The following two graphs reveal the growth of GDP and Net Collection of Direct Taxes.

Figure No 1





http://indiabudget.nic.in/es2016-17/estatvol2.pdf

*DLGDP-Represents first Difference of logGDP *DLNCDT-Represents first Difference of log Net Collection from Direct Taxes.

In the year 2000-01 the direct taxes contribution was Rs. 68,305 billion which was 3.25% in the total Gross Domestic Product of Rs. 2102376 billion. The above graphs reveal the fall of direct taxes in 2008-09, directly affected the growth of GDP. In the year 2012-13, the total direct tax revenue was Rs.558989billions which has an increase in the contribution in the GDP with an increased rate of 5.48%. This rate marginally continued till the previous year 2016-17. In the previous year GDP has grown to 11.91% (Rs.15183710Billions) with Direct Tax contribution of 5.6%(Rs849818Billions).

V. Data Analysis

In calculating Gross Domestic Product, the total gross value of final products produced by the economy in a whole year, is taken into account. GDP technically called as Gross National Product. It is measured at market prices.

Table No-1. Converted Log variables

	DLGDP	DLNCDT
2000-01		
2001-02	0.08157123...	0.01298899...
2002-03	0.07474281...	0.18292832...
2003-04	0.11389768...	0.23489780...
2004-05	0.16297502...	0.23382774...
2005-06	0.13028416...	0.21862786...
2006-07	0.15084405...	0.33161224...
2007-08	0.14946947...	0.31157743...
2008-09	0.12126805...	0.06015254...
2009-10	0.13709869...	0.12446491...
2010-11	0.17263795...	0.16524689...
2011-12	0.16044693...	0.10220145...
2012-13	0.11554529...	0.12362059...
2013-14	0.11581509...	0.13314222...
2014-15	0.09935525...	0.08577874...
2015-16	0.07863466...	0.06422435...
2016-17	0.11256861...	0.13574709...

Unit Root Analysis: The data retrieved from Economic Survey is Time –Series data. Original non-stationery data is converted into stationary data by using Augmented Dickey Fuller Test (ADF) , the results are tabulated below.

Null hypothesis H_o P = 1 for Unit root

Alternative hypothesis H_1 P < 1 Stationary..

Table No.2

Variable	Level	First Difference
GDP	1.0000	0.8539
NCDT	1.0000	0.2272

Both independent variable (NCDT) and Dependent variable (GDP) are stationery at First difference.

Dependent Variable: GDP
Method: Least Squares
Date: 11/18/17 Time: 22:51
Sample: 1 17
Included observations: 17

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NCDT	16.66470	0.430269	38.73091	0.0000
C	721843.2	192379.2	3.752191	0.0019

R-squared	0.990100	Mean dependent var	6902662.
Adjusted R-squared	0.989440	S.D. dependent var	4310608.
S.E. of regression	442976.0	Akaike info criterion	28.95055
Sum squared resid	2.94E+12	Schwarz criterion	29.04857
Log likelihood	-244.0797	Hannan-Quinn criter.	28.96029
F-statistic	1500.084	Durbin-Watson stat	0.456391
Prob(F-statistic)	0.000000		

Figure no.2

R^2 value > Drbin-Watson stat, which indicates a spurious Regression. The study Went on to confirm the same by applying a Serial Correlation LM Test.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	11.41042	Prob. F(2,13)	0.0014
Obs*R-squared	10.83041	Prob. Chi-Square(2)	0.0044

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/18/17 Time: 22:51
Sample: 1 17
Included observations: 17
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NCDT	-0.007861	0.292897	-0.026838	0.9790
C	3133.802	126734.8	0.024727	0.9806
RESID(-1)	1.058824	0.261177	4.054047	0.0014
RESID(-2)	-0.401857	0.283005	-1.419966	0.1792

R-squared	0.637083	Mean dependent var	-2.74E-11
Adjusted R-squared	0.553333	S.D. dependent var	428909.7
S.E. of regression	286654.0	Akaike info criterion	28.17226
Sum squared resid	1.07E+12	Schwarz criterion	28.36831
Log likelihood	-235.4642	Hannan-Quinn criter.	28.19175
F-statistic	7.606943	Durbin-Watson stat	1.932332
Prob(F-statistic)	0.003462		

Figure no.3

The result showed that there is Auto problem in the data.
Hence to solve the problem of Auto Correlation the variables are converted into the Log variables.
The unit root test was applied for Log applied Variables and the results are tabulated as shown below.

Table No.3

Variable	Level
LGDP	0.9312
LNCDT	0.5353

Both independent variable (LNCDT) and Dependent variable (LGDP) are stationery at Level itself.
The researchers went on to apply OLS for further analysis and the results are as follows.

Dependent Variable: LGDP
Method: Least Squares
Date: 11/18/17 Time: 22:56
Sample: 1 17
Included observations: 17

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCDT	0.757524	0.032136	23.57235	0.0000
C	6.062042	0.403343	15.02951	0.0000

R-squared	0.973714	Mean dependent var	15.54829
Adjusted R-squared	0.971962	S.D. dependent var	0.667302
S.E. of regression	0.111737	Akaike info criterion	-1.435215
Sum squared resid	0.187276	Schwarz criterion	-1.337190
Log likelihood	14.19933	Hannan-Quinn criter.	-1.425471
F-statistic	555.6556	Durbin-Watson stat	0.277252
Prob(F-statistic)	0.000000		

Figure no.4

R^2 > Durbinwatson stat, this indicates that there is a Spurious Regression and the researchers went on to confim the problem and did the Serial Correlation LM test.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	26.52890	Prob. F(2,13)	0.0000
Obs*R-squared	13.65445	Prob. Chi-Square(2)	0.0011

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/18/17 Time: 22:56
Sample: 1 17
Included observations: 17
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCDT	0.005007	0.015960	0.313738	0.7587
C	-0.060706	0.199599	-0.304142	0.7658
RESID(-1)	1.336170	0.234160	5.706223	0.0001
RESID(-2)	-0.559499	0.253126	-2.210355	0.0456

R-squared	0.803203	Mean dependent var	-5.83E-16
Adjusted R-squared	0.757788	S.D. dependent var	0.108188
S.E. of regression	0.053245	Akaike info criterion	-2.825501
Sum squared resid	0.036855	Schwarz criterion	-2.629451
Log likelihood	28.01676	Hannan-Quinn criter.	-2.806014
F-statistic	17.68593	Durbin-Watson stat	1.804541
Prob(F-statistic)	0.000071		

Figure No.5

The result is seen clearly that the data has Auto Correlation problem, this is known as the Probability value is less than 0.05, indicating rejection of null hypothesis. i.e. there is Auto Correlation problem.
To solve this problem of Auto Correlation the Log variables were converted into the DLGDP and DLNCDT. The unit root test results of these variables were givn below.

Table No.4

Variable	Level
DLGDP	0.2018
DLNCDT	0.0975

Both independent variable (DLNCDT) and Dependent variable (DLGDP) are stationery at Level itself.
The researchers continued for further analysis for applying the OLS method to find out the impact of net collection of Direct taxes on Gross Domestic Product.
The Serial Correlation LM test was applied for these variables also to find whether the Auto Correlation problem is solved or not. The result is as follows

Null Hypothesis H_o =No Auto Correlation.
Alternate Hypothesis H_1 = Auto Correlation.

Serial Correlation LM test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.091942	Prob. F(2,12)	0.0826
Obs*R-squared	5.441199	Prob. Chi-Square(2)	0.0658

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/18/17 Time: 23:02
Sample: 2 17
Included observations: 16
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLNCDT	0.033678	0.070900	0.475006	0.6433
C	-0.004939	0.012735	-0.387838	0.7049
RESID(-1)	0.691439	0.279093	2.477453	0.0291
RESID(-2)	-0.302300	0.287804	-1.050369	0.3142

R-squared	0.340075	Mean dependent var	3.36E-18
Adjusted R-squared	0.175094	S.D. dependent var	0.026355
S.E. of regression	0.023937	Akaike info criterion	-4.414477
Sum squared resid	0.006876	Schwarz criterion	-4.221330
Log likelihood	39.31581	Hannan-Quinn criter.	-4.404586
F-statistic	2.061294	Durbin-Watson stat	1.931297
Prob(F-statistic)	0.158994		

Figure No.6

The Probability Value is 0.08 which is greater than 0.05 , which means that the Null Hypothesis cannot be rejected. This indicates that the Auto Correlation problem is not there. So the study is continued for further analysis for Heteroskedasticity test.

Heteroskadaucity test is used to confirm the robustness of the Ordinary Least Squares . One of the assumptions made about residuals/errors in OLS regression is that the errors have the same but unknown variance. This is known as constant variance or homosckedasticity. When this assumption is violated, the problem is known as Heteroskedasticity. If P > 0.5, accept the null Hypothesis.

Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.085885	Prob. F(1,14)	0.7738
Obs*R-squared	0.097556	Prob. Chi-Square(1)	0.7548
Scaled explained SS	0.070610	Prob. Chi-Square(1)	0.7905

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/18/17 Time: 23:03
Sample: 2 17
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000778	0.000494	1.575011	0.1376
DLNCDT	-0.000804	0.002745	-0.293061	0.7738

R-squared	0.006097	Mean dependent var	0.000651
Adjusted R-squared	-0.064896	S.D. dependent var	0.000925
S.E. of regression	0.000954	Akaike info criterion	-10.95473
Sum squared resid	1.27E-05	Schwarz criterion	-10.85816
Log likelihood	89.63785	Hannan-Quinn criter.	-10.94979
F-statistic	0.085885	Durbin-Watson stat	1.739863
Prob(F-statistic)	0.773774		

Figure No.7

The probability Value is 0.7738 which is greater than 0.05, indicates that there is no Heteroskedasticity problem with the data. For further analysis the residual are normally distributed or not, a Normality test is applied and the results are shown below.

In statistics errors are common in nature. Normality test finds out whether the error term follows normal distribution. Hypothesis is stated as follows:

H_o =Residuals are normally distributed

H_1 = Residuals are not normally distributed

Table No.5-Normality Test

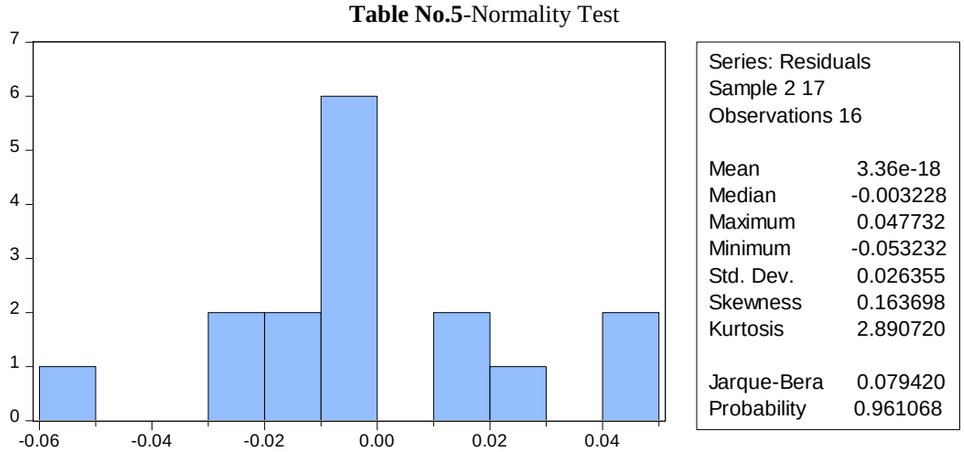


Figure No.8

The Probability value is more than 0.05, meaning the Null Hypothesis is accepted and concluded that the Error term are normally distributed.

Hence the Variables DLGDP and DLNCDT, the dependent variable and the independent variables have cleared all the required conditions namely the Serial Correlation LM Test, Heteroskedasticity and the Normality tests, for applying the Ordinary Least Squares (OLS) Method.

Ordinary Least Squares Method has been applied to examine the impact of NetCollection of Direct Taxes on Gross Domestic Product at Current Market Prices. It is used to determine a line of best fit by minimizing the sum of squares created by a mathematical function. A "square" is determined by squaring the distance between a data point and the regression line.

GDP= f (NCODT)

The study went on to continue with the OLS method and the output is listed below.

Impact of Net contribution of Direct Taxes on GDP.

Dependent Variable: DLGDP
Method: Least Squares
Date: 11/18/17 Time: 23:01
Sample (adjusted): 2 17
Included observations: 16 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLNCDT	0.173579	0.078463	2.212245	0.0441
C	0.096222	0.014119	6.814893	0.0000

R-squared	0.259025	Mean dependent var	0.123572
Adjusted R-squared	0.206098	S.D. dependent var	0.030617
S.E. of regression	0.027280	Akaike info criterion	-4.248848
Sum squared resid	0.010419	Schwarz criterion	-4.152274
Log likelihood	35.99078	Hannan-Quinn criter.	-4.243902
F-statistic	4.894026	Durbin-Watson stat	0.942496
Prob(F-statistic)	0.044076		

Figure No.9

The above chart clearly shows that the DNCDT is having Significant effect on the dependent variable i.e. DLGDP, as the probability value of DLNCDT is 0.0441 which is less than the 0.05, meaning the Null Hypothesis is rejected. This means that the net collection of direct taxes is having significant effect on the gross domestic product.

VI. Conclusions

It is evident from the present study, that there is a significant impact of Net Collection of Direct taxes on Gross Domestic Product. India raises about 50% GDP in the form of Direct taxes. This envisages that Policy makers have to therefore emphasize on tax evasion and tax collection. Indian Taxation system is even though is lucid, when it comes for collection its becoming complex which mean that policy making should be in interest of country but not in the interest of Individuals. India can mobilize more investments so as to compete on global platform.

Future research can be conducted by taking both direct and Indirect taxes contribution on GDP. Further the future studies can be conducted by studying contribution from all other sectors such as Industry, Services and Agricultural sectors towards the GDP.

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