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DETERMINANTS OF DIRECT TAX REVENUE IN INDIA: AN EMPIRICAL STUDY VIA INCORPORATING CONVENTIONAL, FINANCIAL, SOCIAL AND ECONOMIC POLICY FACTORS

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Abstract *Revenue mobilisation remains a stringent challenge for all countries across the globe, especially for underdeveloped and developing nations. But the capability of the government to generate revenue is limited and depends upon many factors. Therefore, the current study tries to explore the determinants of direct tax revenue of the government in India by incorporating conventional, social, financial and economic policy factors. The results explicate that in conventional factors, the agriculture sector contribution in sectoral composition has a negative impact, but trade openness has a positive and statistically significant impact on the direct tax collection of the government. Moreover, in social variables, urbanisation rates have positive impact in both the short and long run on the tax revenue of the government. In financial variables, the result illustrates that the credit deposit ratio has a positive, but, statistically insignificant impact and financial development have a positive and statistically significant impact on the direct tax collections of the government in India. Similarly, in economic policy factors, FDI, NODAU and broad money have a positive impact; however, the coefficient is significant only for broad money. The current study will act as a guide for policymakers, academicians and governments in formulating future policies and reforms in the direct taxation system of the country.*

Keywords: *Direct Tax Revenue, Government, Conventional Factors, Economic Policy Factors, Financial Development*

JEL Classification: *C32, E62, H21, H25, H20*

INTRODUCTION

Taxation is one of the main sources for generating revenues for governments across the world for meeting their policy goals. According to International Monetary Fund, taxes are a key instrument for raising revenue, promoting economic growth, reducing inequality and financing public goods and services. Mankiw et al., 2009 also found that taxes may influence the long-run economic growth of a nation by affecting both the incentives for work and investment and the allocation of resources within the economy. The revenue from taxation builds the government's capability to meet basic needs, provide security to its citizens and fosters economic growth, but the capability of the government to generate revenue from taxation is limited and constrained by a number of factors (Garg et al., 2022a; Banshiwal & Kaduyan, 2023). Moreover, the resources generated by the government through the collection of taxes are widely used to fund public goods and services, that is, education, infrastructure and healthcare which are essential for economic development and social well-being of a nation (Andreoni et al., 1998; Ibrahim et al., 2015; Ogunmakin et al., 2021; Garg et al., 2023b; Garg et al., 2022a). Thus, taxes play a vital role in ensuring the smooth functioning of an economy and the well-being of its citizens. Therefore, the research studies conducted on public finance specifically,

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taxation has received prime attention from researchers, academicians, government and policymakers (Garg et al., 2023a). However, governments need to caution specifically for redundant taxes and increase public spending as distortionary taxes may also reduce economic growth if charged by the governments beyond a certain limit (Bartik, 1992). Therefore, it is a critical question around the globe what should be the optimum tax-to-GDP ratio. But in reality, governments around the globe have different policy goals in terms of public expenditure resulting in the need for different levels of taxation for various nations around the globe. Conversely, the tax-to-GDP ratio varies from country to country across different region which is a matter of widespread debate in the literature. There are several studies that have been conducted on determinants of tax revenue of the government around the globe, but the results seem to be inconsistent in terms of variables and research methodology adopted for diverse categories of countries (Castro & Camarillo, 2014). There are two types of taxes primarily for the government for collecting taxes: direct and indirect taxes. Direct taxes are crucial source of revenue for the government of India, contributing approximately 50% of the total tax revenue. It is usually levied on the income and wealth of individuals and corporations and includes taxes such as income tax, wealth tax and corporate tax (Garg et al., 2023b). Direct taxes play a vital role in funding social welfare programs, infrastructure development and other public goods and services that are indispensable tool for the economic growth and development of the country. According to a report published by the Central Board of Direct Taxes (2021), the total net direct tax collection in India for the fiscal year 2020–21 was 9.45 lakh crore rupees, reflecting a growth of 5.88% over the previous year[1]. This explicates the significance of direct taxes in generating revenue for the government and funding various developmental initiatives. Direct taxes also play a crucial role in plummeting income inequality and promoting social justice. As direct taxes are usually progressive in nature, which may also help in the redistribution of income from the richer section of society to the poor section and reduce poverty levels (Pirttila & Tukiainen, 2016). Furthermore, direct taxes also help to promote tax compliance and discourage tax evasion, which may have a favourable impact on the overall tax revenue collection. In conclusion, direct taxes are crucial for the Indian government to generate revenue and fund essential public goods and services. Therefore, it becomes essential for the government to continue to design and implement effective direct taxation policies that are tailored to the specific needs and challenges of the country.

[1] https://pib.gov.in/PressReleasePage.aspx?PRID=1710598.

India's Tax-to-GDP ratio for the financial year 2019–20 stood at only 9.88% which was very low in comparison to the OECD (Organization for Economic Cooperation and Development) average of 33.8%. There are numerous factors that contribute significantly in lower direct tax revenue collection of the country, that is, low tax compliance, tax evasion and a larger share of the informal sector in the Indian economy (Garg et al., 2022a). There are copious studies that have been conducted on determinants of tax revenue across the globe using different types of econometric tools with diverse research variables. However, the studies conducted on developing economies like India are limited and have used only a few research variables with confined econometric tools in spite of the huge contribution of direct tax revenue in the economic development of the country. Moreover, there is hardly any econometric-based study that has focused on the impact of financial and social variables on the direct tax revenue collection of the government in India. Therefore, the current study endeavour to assess the conventional, financial, social and economic policy determinants of direct tax revenue collection of the government in India so that necessary corrective measures may be taken by the competent authority to ensure sufficient revenue from taxation in India.

The remaining sections of the study are structured as: Section 2 discusses the theoretical and empirical past research conducted on this phenomenon; Section 3 discusses the theoretical framework and research methodology used in the present study; Section 4 discusses the empirical findings concerning the determinants of direct tax efforts of the government in India. Finally, section 5 provides the policy implications and conclusive part of the study.

LITERATURE REVIEW

The importance of public revenue in developing economies cannot be undermined if they are to realise their ambitions of accelerated economic growth. Therefore, the area of public finance especially, the determinants of tax revenue has received prime attention from academicians over the past few decades (Garg et al., 2022b; Garg et al., 2023c). The amount of revenue collected by the government through taxes depends on conventional and non-conventional factors. Conventionally, sectoral composition of a nation's GDP, population growth and international trade are considered as major factors influencing the tax efforts of a country (Chelliah, 1971; Bahl, 1971; Ghura, 1998; Gupta, 2007; Bird et al., 2008). However, with time, a number of studies have proven that although the conventional factors are equally essential in determining the tax efforts of a nation, but the importance of primary determinants of tax efforts of the

government cannot be disregarded. Tanzi (1989) observed that the conventional factors cannot explicate the complete fluctuations in the tax revenue collections of a country. Conversely, their result explicates that the fluctuations in the macroeconomic policy environment have a major role to play in the tax revenue performance of a country. Similarly, Bird et al., 2008 found that a nation cannot increase its tax revenue by merely focusing on conventional determinants. With the passage of time, a number of studies conducted by Ghura, 1998; Drummond et al., 2012; Yohou and Goujon, 2017 proved that a country may increase its tax revenue performance only in the short run up to an extent by limiting its attention only to conventional determinants, however, to boost the tax collections in the long run, a nation has to focus primarily on non-conventional determinants also. On the basis of the assertion of these studies, there is a need to study the non-conventional factors of the tax revenue of a country. The financial system of a country may have an impact on tax revenue collections of a country. The economic growth of a country expands the taxable economic activities in a country which might increase the tax revenue of the government. Moreover, the expansion in economic activities results in an increase in demand for goods and services which ultimately results in an increase in investment in the country. However, in the absence of a sound financial system, these activities cannot be accomplished (Ajide & Bankefa, 2017). Thus, financing variables play a pivotal role in determining the taxation revenue of a country by providing a platform for resource mobilisation (Manan et al., 2022). The banking sector plays a pivotal role in value creation for business activities by providing loans for working and permanent capital for business units in India (Mohanty et al., 2017). Indian economy is a banking sector-oriented economy where bank credit plays a major role in achieving business transactions. Therefore, the study has used the Credit Deposit Ratio (CDR) of schedule commercial banks and domestic credit deployment to the private sector in the country as a proxy for measuring the financial development (FIND) in India for assessing the impact of banking transactions on the tax revenue efforts of the governments. The deployment of credit to the private sectors has been widely used as a proxy for measuring the FIND in an economy by Jiang and Ma 2019; Khan et al., 2020; Khan et al., 2021. Similarly, the social factors, that is, literacy rate, urbanisation rate and population growth are also major determinants of tax revenue of the government (Piancastelli, 2001; Bahl & Wallace, 2005; Mahdevi, 2008; Pessino & Fenochietto, 2010). However, the data on population growth and literacy rate is not available in annual terms for India. Therefore, the study has used the urbanisation rate only for measuring the impact of social variables on the tax efforts of the government in India. Similarly, the study has used economic policy factors namely: FDI inflow, exchange rate, broad money supply as a % of GDP and Net Official development assistant and aid received (NODAU) to measure the impact of economic policy factors on direct tax revenue of the government in India which is extensively used in the literature by Mahdevi, 2008; Bird et al., 2008; Castro & Camarillo, 2014; Alabede, 2018; Manan et al., 2022 etc. Thus, the current study endeavors to extend the conventional factors by incorporating financial, social and macro-economic policy factors with conventional factors determining the direct tax revenue of the government in India. There is hardly any econometric-based study that has focused on financial and socio-economic determinants of tax efforts of the government especially in India. Moreover, India's tax-to-GDP ratio for the financial year 2019-20 stood at only 9.88% which was very low in comparison to the OECD average of 33.8%. Kaldor, 1963 also found in their study that developing countries need to collect tax revenue greater than 10-15% of their GDP if they wish to be a developed nation. Therefore, low tax-to-GDP ratio of the nation earmarks the importance of the current study in the Indian context. Nevertheless, despite the mounting number of national and international studies on determinants of tax revenue, there is utterly no empirical evidence in the literature to support the linkage between conventional, social, financial and macro policy environment factors as determining the tax efforts of a country. Therefore, the current study tries to fulfill this research gap by expanding the conventional model to financial and socio-economic variables to explore their impact on the tax effort of the government in India.

RESEARCH OBJECTIVE AND METHODOLOGY

The current study aims to assess the factors determining the direct tax revenue of the government in India. For achieving the objective, the study has used secondary data from "*World Development Bank Indicators (WDBI)*", which is a principal compilation of development indicators of the World Bank. Moreover, the study has collected data on the CDR of schedule commercial banks from various publications of RBI. The data on the tax-to-GDP ratio is collected from the official website of the "Central Board of Direct Taxes (CBDT)" For achieving the objective of the study, the study has used the data from 1990–91 to 2020–21. The recent year 2021–22 has been excluded from the analysis as WDBI has not updated the data for the recent year.

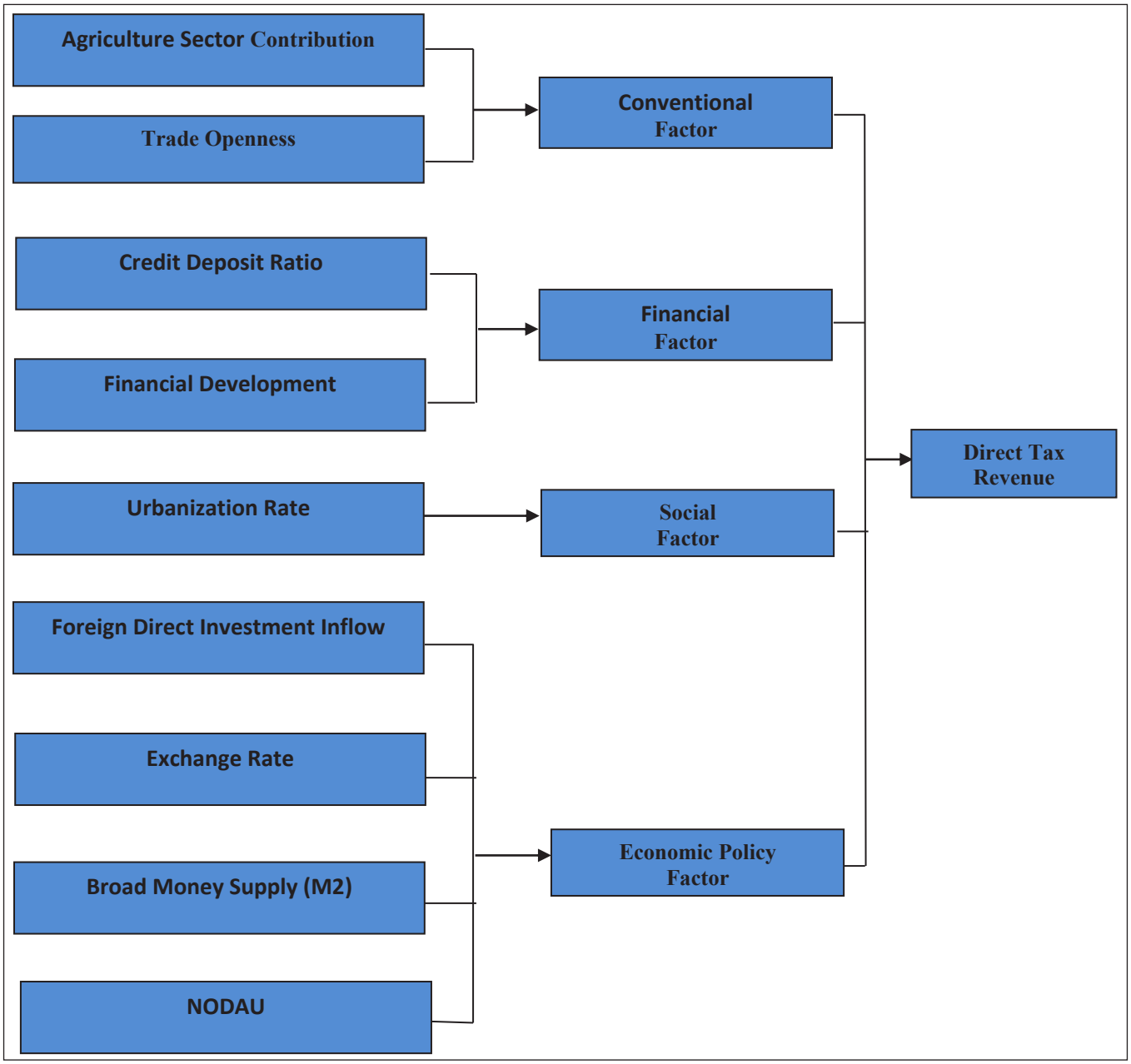

Fig. 1: Conceptual Framework

The relationship between the variables of the study is expressed below:

$$DTR_t = f(AGRC_t, TO_t, CDR_t, FIND_t UBR_t, FDII_t, EXCR_t, M2_t, NODAU_t) \quad (1)$$

Where DTR represents the log of the direct tax revenue (as a % of GDP) of the government; AGRC represents the contribution of the agriculture sector in GDP, TO is abbreviated for trade openness which is calculated as the import plus export as a % of GDP of India; CDR denotes the credit deposit ratio of schedule commercial banks in India; FIND represents the domestic credits to the private sectors by the banks (as a % of GDP) used as a proxy for measuring FIND in the country; UBR explicates the population living in urban areas as a % of the total population; FDII represents the inflow of foreign direct investment in the Indian economy; EXCR is the acronym for the exchange rate, M2 indicates the broad money supply as a % of GDP, NODAU abbreviated for net official development assistance received.

Fig. 1 explicate the relationship and conceptual model of the study based on the past literature: Furthermore, the table I express the variables of the study and the expected sign of the coefficient with the dependent variable of the study based on past literature as discussed in section 2 of the study:

Table 1: Description of Study Variables

Variables Name	Descriptions of the Research Variables	Expected Symbol
DTR	Log of direct tax revenue	
Conventional Factors		
AGRC	Agriculture sector contribution in sectoral composition (% of GDP)	(-)
TO	Trade Openness which is measured by import and export of India as a % of India's GDP	(+)
Financial Factors		
CDR	Credit Deposit Ratio of Schedule Commercial Banks	(+)
FIND	Deployment of domestic credit to the private sector as % of GDP	(+)
Social Variables		
UBR	Urbanization rate is measured as the people living in the urban area as a % of the total population	(+)
Economic Policy Factors		
FDII	Net inflow of foreign direct investment	(+)
EXCR	Exchange rate of rupees to US dollar	(-)
M2	Broad money supply as a % of GDP in the economy	(+)
NODAU	NODAU abbreviated for net official development assistance received.	(-)

Source: Literature survey.

Unit Root Test

The study has applied the ADF as a parametric and PP as a non-parametric test for checking the stationarity of the variables. The major difference between the ADF and PP unit root test is that ADF uses the parametric structure to detain the serial correlation and the Phillips-Perron test uses the non-parametric correction on the basis of the log run variance of the ΔX_t. ADF and PP unit root test statistics have been used as below:

$$\Delta X_t = \propto + \beta t + \delta X_{t-1} + \sum_{i=1}^{k} \emptyset_i \, \Delta X_{t-i} + \varepsilon_t \quad (2)$$

$$\Delta X_{t-1} = \propto_0 + \rho X_{t-1} + \varepsilon_t \quad (3)$$

Where X_t = price series, β = coefficient on a time trend, k = maximum length of the lagged dependent variable, $\emptyset_i$ = parameter of lagged first, ΔX_t = first difference of series X_t, ε_t = pure white noise error term. The variables of the study are found to be integrated of mix order as UBR and NODAU are stationary at level while other variables I(1). Therefore, the study has employed the ARDL model for studying the relationship between the variables of the study.

Model Specifications

To synthesise the determinants of direct tax revenue, the study has employed the ARDL Model to empirically assess the functional association between direct tax revenue and conventional, social, financial and economic policy determinants of the direct taxation revenue of the government in India. ARDL is a dynamic model which is widely used in the past literature for capturing the dynamic behavior of the variables related to policies (Neog & Gaur, 2020). This model is primarily developed by Pesaran et al. (2001) and is superior to the classical cointegration model as it is more robust in case of a small sample and it is capable to handle financial time series data in case of different orders integrated variables. Therefore, the study has employed the ARDL model specification to examine the long-run relationship and dynamic interactions between direct tax revenue and its determinants using the ARDL cointegration test widely known as ARDL bound test. The ARDL model specification is expressed below in eq. (4):

$$\begin{aligned} \Delta DTR_t = {} & \gamma + \sum_{i=1}^{p} \alpha_1 \Delta DTR_{t-i} + \sum_{i=0}^{p} \alpha_2 \Delta AGRC_{t-i} + \sum_{i=0}^{p} \alpha_3 \Delta TO_{t-i} + \sum_{i=0}^{p} \alpha_4 \Delta CDR_{t-i} + \\ & \sum_{i=0}^{p} \alpha_5 \Delta FIND_{t-i} + \sum_{i=0}^{p} \alpha_6 \Delta UBR_{t-i} + \sum_{i=0}^{p} \alpha_7 \Delta FDII_{t-i} + \sum_{i=0}^{p} \alpha_8 \Delta EXCR_{t-i} + \\ & \sum_{i=0}^{p} \alpha_9 \Delta M2_{t-i} + \sum_{i=0}^{p} \alpha_{10} \Delta NODAU_{t-i} + \beta_1 DTR_{t-i} + \beta_2 AGRC_{t-i} + \beta_3 TO_{t-i} + \beta_4 CDR_{t-i} + \\ & \beta_5 FIND_{t-i} + \beta_6 UBR_{t-i} + \beta_7 FDII_{t-i} + \beta_8 TO_{t-i} + \beta_9 CDR_{t-i} + \beta_{10} FIND_{t-i} + \epsilon_t \end{aligned} \quad (4)$$

Where γ is the constant, α_1 to α_{10} are the short-run and β_1 to β_{10} are the long-run coefficients; p represents to be the number of optimum lags according to the AIC criterion (Akaike, 1974), ε_t is the error term. To observe the cointegration among the variables of current study, the ARDL bound test has been used with H_0 of no cointegration ($\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = \beta_9 = \beta_{10}$) against the H_1 of cointegration ($\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq \beta_8 \neq \beta_9 \neq \beta_{10}$). The f-statistics obtained from the bound test are compared with the upper and lower critical bound proposed by Pesaran et al., 2001. If the measured f-statistic is more than the upper critical bound, then we reject the H_0 of no cointegration. Conversely, if the computed values of f-statistics are lesser than the lower critical bound, the H_0 cannot be rejected. Similarly, the findings should be inconclusive, if the calculated f-statistic is found to be between upper and lower critical bound.

However, the cointegration among the variables also raises a question about short-run fluctuations and how quickly they adjust to long-run equilibrium. The fluctuations are usually noticed as a result of specific policy changes and its lags adjustment process (Neog & Gaur, 2020). Therefore, the insertion of the error correction term in eq. (4) with short-run dynamics helps us in capturing these adjustments in the short-run and provides valuable information for speed of adjustment towards long-run equilibrium as presented in eq. (5):

$$\Delta DTR_t = \gamma + \sum_{i=1}^{p} \alpha_1 \Delta DTR_{t-i} + \sum_{i=0}^{p} \alpha_2 \Delta AGRC_{t-i} + \sum_{i=0}^{p} \alpha_3 \Delta TO_{t-i} + \sum_{i=0}^{p} \alpha_4 \Delta CDR_{t-i} + \sum_{i=0}^{p} \alpha_5 \Delta FIND_{t-i} + \sum_{i=0}^{p} \alpha_6 \Delta UBR_{t-i} + \sum_{i=0}^{p} \alpha_7 \Delta FDII_{t-i} + \sum_{i=0}^{p} \alpha_8 \Delta EXCR_{t-i} + \sum_{i=0}^{p} \alpha_9 \Delta M2_{t-i} + \sum_{i=0}^{p} \alpha_{10} \Delta NODAU_{t-i} + \alpha_{11} ECT_{t-i} + \mu_t \quad (5)$$

RESULT AND DISCUSSION

In econometric modeling, it is usually required to check the order of integration of the research variables before running econometric estimations to avoid the situation of spurious regression. Therefore, the current study has examined the order of integration of the research variable using widely applied ADF and PP unit root tests. Table 2 presents the results of the ADF and PP unit root test applied for checking the integration of the research variables. The results depict that the variables (except UBR and NODAU) are integrated of order (1). Thus, the result explicates a mixed order of integration among research variables as presented in Table 2.

Table 2: Unit Root Test

Variables Name	ADF		PP		Order of Integration
	Constant	Constant & Trend	Constant	Constant & Trend	
DTR	-1.9723 (0.2967)	-1.5880 (0.7738)	-1.9090 (0.3239)	-1.7011 (0.7257)*	I(1)
Δ*DTR*	-4.6866 (0.0008)*	-4.8148 (0.0030)*	-4.6752 (0.0008)*	-4.8193 (0.0030)*	
AGRC	-2.7765 (0.0750)**	0.1020 (0.9957)	-2.4240 (0.1439)	-0.6015 (0.9715)	I(1)
Δ*AGRC*	-6.6845 (0.0001)*	-5.8155 (0.0006)*	-6.2634 (0.0000)*	-7.568 (0.0000)*	
UBR	-9.6342 (0.0000)*	-6.6374 (0.0000)*	-9.7723 (0.0000)*	-4.5702 (0.0000)*	I(0)
CDR	-0.8059 (0.8030)	-1.9818 (0.5873)	-0.8367 (0.7939)	-2.1545 (0.4963)	I(1)
Δ*CDR*	-5.1615 (0.0002)*	-5.008 (0.0019)*	-5.1615 (0.0002)*	-5.008 (0.0019)*	
M2	-0.6906 (0.8343)	-1.5102 (0.8034)	-0.7100 (0.8293)	-1.6206 (0.7605)	I(1)
Δ*M2*	-4.5283 (0.0012)*	-4.4282 (0.0076)*	-4.5264 (0.0012)*	-4.4299 (0.0076)*	
TO	-1.5873 (0.4765)	-0.3499 (0.9850)	-1.5802 (0.4800)	-0.4204 (0.9819)	I(1)
Δ*TO*	-4.5706 (0.0011)*	-4.9082 (0.0024)*	-4.5641 (0.0011)*	-4.9082 (0.0024)*	

Variables Name	ADF		PP		Order of Integration
	Constant	Constant & Trend	Constant	Constant & Trend	
NODAU	-6.6571 (0.0000)*	-6.6373 (0.0000)*	-9.5819 (0.0000)*	-13.8870 (0.00000)*	**I(0)**
Fin	-0.5291 (0.8718)	-1.1073 (0.9110)	-0.6195 (0.8517)	-1.5118 (0.8029)	**I(1)**
Δ*Fin*	-5.0445 (0.0017)*	-4.5885 (0.0052)*	-4.8789 (0.0005)*	-4.7906 (0.0032)*	
EXR	-0.5431 (0.8688)	-1.5482 (0.7893)	-0.5985 (0.8565)	-1.8054 (0.6769)	**I(1)**
Δ*EXR*	-4.7102 (0.0008)*	-4.6250 (0.0048)*	-4.7127 (0.0007)*	-4.6252 (0.0048)*	
FDII	-2.2303 (0.2003)	-2.5714 (0.2948)	-2.1907 (0.2135)	-2.5589 (0.3001)	**I(1)**
Δ*FDII*	-6.0643 (0.0000)*	-6.0192 (0.0002)*	-6.6657 (0.0000)*	-7.0582 (0.0000)*	

Notes to Table: *, ** indicates sig. at 1 and 5% correspondingly. ΔΔ denote variable is integrated of order 1. The optimum lag length was selected by using Schwarz information criteria.

Source: Author's computations.

As the variables of the study were found to be integrated of mix order, therefore, the study has employed the ARDL econometric model to examine the association between direct tax revenue and conventional, social, financial and macro policy determinates of tax revenue of the government. The ARDL model is superior to VAR and classical cointegration models in case of different levels of cointegration of research variables (Koçak, 2021). Therefore, to assess the long-run relationship between the variables of the study, the ARDL bound test has been employed as presented in Table 3.

Table 3: ARDL Bound Test

Variables Name	F-Stat	C.V. at 1%		C.V. at 5%		C.V. at 10%		Decision
		I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	
F_{LDT} = (DTR| AGRC, UBR, CDR, M2, TO, FIND, NODAU, EXCR, FDII)	6.1827*	2.65	3.97	2.14	3.3	1.88	2.99	Co-integrated

Notes to Table: * Sig. at level (α = 0.01). Lag k is 9. I(0) and I(1) show lower and upper bound statistics. C.V. indicates Critical Value.

Source: Author's computations.

The computed f-stat for the cointegration test is 6.1827 resulting in rejection of the H_0 of no long run relationship. Therefore, upon confirmation of the existence of the long-run relationship between direct tax revenue and independent variables, the short-run and long-run coefficients of the model are estimated as presented in Table 4. The result of the long-run coefficient explicates that the agriculture sector contribution to the GDP of the country has negative impact on the tax efforts of the government in India.

Table 4: Result of ARDL Model

Long-Run Co-Efficient				
Variable Name	**Coefficient**	**Std. Error**	**t-Stat.**	**Prob. Value**
AGRC	-0.042697	0.016279	-2.622911	0.0178**
TO	0.013669	0.005749	2.377657	0.0294**
CDR	0.013360	0.007904	1.690392	0.1092
FIND	0.026837	0.015257	1.758999	0.0966***
UBR	0.277884	0.049734	5.587439	0.0000*
FDII	0.033344	0.041796	0.797774	0.4360
EXCR	-0.004563	0.006801	-0.670940	0.5113

Long-Run Co-Efficient				
Variable Name	**Coefficient**	**Std. Error**	**t-Stat.**	**Prob. Value**
M2	0.024907	0.009472	2.629540	0.0340**
NODAU	0.000654	0.042813	0.015278	0.9880
Short-Run Co-efficient and Error Correction Model Results				
C	-4.115788	0.440178	-9.350281	0.0000*
D(UBR)	1.441674	0.145546	9.905311	0.0000*
D(M2)	0.018104	0.002475	7.313225	0.0000*
ECT_{t-1}	-0.621278	0.063890	-9.724144	0.0000*
Diagnostic Testing				
R^2	0.8283	J-B Statistic		4.5416 (0.1032)
Adj. R^2	0.8086	ARCH-LM		0.5648 (0.4588)
D-W Statistic	2.4711	BPG		0.3160 (0.9761)
F-Statistic	41.8354	BG LM Test		2.1630 (0.1608)
	(0.0000)*	Ramsey Reset		0.3508 (0.5620)

Notes to table: *, ** indicates significant at 1 and 5%. The optimum order for the ARDL model is determined based on AIC information criteria. P-values are provided in parenthesis () for diagnostic testing. Ramsey Reset test is for model misspecification. BPG is Breusch-Pagan-Godfrey and the BG LM test is the Breusch-Godfrey serial correlation test.

Source: Author's computations.

The developing economies are usually found inherited with several structural composition restrictions in their economy which restrict them to collect tax revenue with their full capacity from specific modern taxes (Mahdevi, 2008). In developing economies, usually, a larger share of GDP is obtained from agricultural activities which are historically a difficult sector to tax due to the presence of subsistence activities that are usually informal in nature. Moreover, a sizeable portion of this sector is small in size with few taxpayers paying taxes on their earnings. Similarly, this sector is usually found to be under-taxed in underdeveloped and developing economies (Garg et al., 2023a). Moreover, the under-taxation of the agriculture sector has increased the horizontal inequity between small and larger farmers (Krishna, 1972). The Kelkar task force[2] 2002 also reported that 95% of the farmers were below the tax threshold in India. Bhargava (1999) also found in their study that following the implementation of India's third five-year plan, the significance of the agricultural sector had reduced significantly in India. Similarly, the result indicates that a unit increase in agriculture sector contribution to India's GDP results in a decline of 0.042 units in direct tax revenue of the government in India. Thus, the coefficient of this variable is in accord with past literature and as per the expectation of the model.

The coefficient of trade openness is statistically significant and positive indicating a positive impact of trade liberalisation on the direct tax revenue collections of the government in India. The extent of openness of an economy is usually determined by the volume of trade of a country with other countries. The result indicates that a 1% increase in the trade openness of the country increases the direct tax revenue of the government by 1.36% as indicated by significant p-value and positive coefficient in table IV. Thus, the coefficient of this variable is as per the expectation of the model. Gnangnon and Brun (2019) also investigated the impact of trade openness on tax revenue in 95 developing economies using the GMM approach. They found that trade openness has a favorable and statistically significant impact on the tax revenue of developing economies. Ghura, 1998 also found that international trade is well-organised, simple to tax and may be used as a source for increasing the revenue of the government. Nahidi and Seif (2012) found that trade openness has a positive impact on manufacturing value added in Iran. Similarly, Khattri (2003) also contended that trade liberalisation would eventually result in less public revenue and an increase in the budget deficit of the government unless the anticipated losses in trade tax revenue is matched by domestic direct and indirect tax revenue. Moreover, the Indian economy is a banking sector-oriented economy where bank credit plays a major role in achieving business transactions. The banking sector plays a pivotal role in value creation for business activities by providing loans for working and permanent capital for business units in India (Mohanty et al., 2017). Therefore, the study has used the CDR of schedule commercial banks and domestic credits by the banks to the private sectors (FIND) as a proxy for measuring FIND in the country to measure the impact of FIND on the direct tax revenue collection of the government

[2] https://www.civilsdaily.com/should-agriculture-be-taxed/.

in India. The result as presented in Table 5 explicates that the CDR of schedule commercial banks has a positive impact on the tax revenue collection of the government in long run but the coefficient is statistically insignificant as indicated by insignificant p-value, However, the FIND has a significant positive impact on the direct tax revenue collection of the government in India. A unit increases in FIND increases the direct tax revenue of the government by 0.0268 units in the long run. Ajide and Bankefa, 2017 also found that the economic growth of a country expands the taxable economic activities in a country which might enhance the tax revenue of the government. Similarly, Taha et al., 2013 also found a more significant short run impact of FIND on the direct tax revenue of the government in Malaysia. Similarly, Akram (2016) also found bidirectional causality between the tax revenue and credit deployment to the private sector by banks.

Moreover, the coefficient of the urbanisation rate is highly significant and positive indicating a positive impact of the urbanisation rate on the tax effort of the government in India. The result explicates that a unit increase in urbanisation rate increases the direct tax revenue of the government by 0.278 units. The increase in urbanisation rate is usually found to be associated with a high level of education among the general public resulting in higher tax compliance among taxpayers. Khattry et al. (2002) also found that the increase in urbanisation rate increases the demand for public goods and services on the demand side, and on the supply side, it increases the tax base as economic activities are found to be more concentrated in urban areas. Yu (2023) also found that the concentration of the urban population helps in enhancing the quality of the government public services which ultimately results in enhancing the tax revenue by improving corporate tax compliance. Similarly, Mahdevi (2008) also found a positive association between the urbanisation rate and tax revenue collection of the government in developing economies. Thus the impact of the urbanisation rate is found to be positive on direct tax revenue collections of the government in India in the short and long run as indicated by significant p-value in Table 4.

Similarly, the coefficient of the FDI (net inflow) was positive but statistically insignificant. Camara, (2023) also contended that foreign direct investment may increase the tax revenue of the government directly through personal income taxes, corporate taxes, royalties and indirectly through VAT by increasing the productivity of the host country. Similarly, Zhang, (2001) found that FDI helps in increasing the tax revenue of a country by boosting the employability opportunities in the country. Moreover, the knowledge transfer and diffusion of technology through FDI allow the host nation to increase their tax revenues through income taxes by generating more income in the economy (Nguyen et al., 2014). However, in our case, the coefficient for FDI is positive but statistical insignificant indicating no empirical evidence of the impact of FDI inflow on the direct tax revenue of the government. Similarly, the coefficient of the exchange rate is negative and statistically insignificant. Agbeyegbe et al., 2006 also found that the fluctuations in the exchange rate might have very little effect on personal income tax and corporate tax collections of the government. Conversely, the coefficient of the broad money supply (M2) is positive and statistically significant explicating a positive impact of money supply on the direct tax revenue of the government in Indian economy. The coefficient of M2 illustrates that a 1% increase in the broad money supply in the economy boosts the tax revenue of the government by 2.4%. Chaudhry and Munir (2010) also found a positive impact of the money supply on the tax revenue of the government in Pakistan. Karagöz (2013) also found a positive association between the monetisation rate and tax revenue collection of the government. Similarly, Manan et al., 2022 also observed a positive impact of broad money supply on tax revenue collections of the government in Pakistan. Moreover, NODAU depicts a positive but statistical insignificant impact on the tax revenue collection of the government in India. However, Manan et al., 2022 found a negative impact of NODAU on tax revenue collection of the government in Pakistan. But Benedek et al., 2014 instituted that the relationship between NODAU and domestic tax revenue seems to be weekend in reply to greater efforts at mobilising domestic revenue in many developing economies. Thus, our results depict that official development assistance does not have any significant impact on the direct tax revenue collection of the government in India.

Moreover, the coefficient of the ECT_{t-1} (χ^2 = -0.621278, p-value 0.000) is negative and statistical significant, thus demonstrating the long-run association between the variables of the study. The value of the coefficient of ECT_{t-1} is 0.621 which indicates that the speed of adjustments towards long-run equilibrium is 62.1% annually indicating that the error correction process takes place nearly 7 and half months. Similarly, R^2 of the constructed ARDL model is 0.8283 indicating that 82.83% of the variation is elucidated by the independent variables considered in the study. The prob. value of the F-statistics (χ^2 = 41.8354, p-value 0.000) indicates that the model of the study is highly fit. Moreover, the study has performed the diagnostic testing using the J-B statistic for normality, the ARCH-LM test for heterogeneity, Breusch-Pagan-Godfrey (BPG) and Breusch-Godfrey (BG) test for serial correlation. The result of the J-B statistic (χ^2 = 4.5416, with P-value 0.1032) indicates that the residuals of the constructed ARDL model are normally distributed. Similarly, the ARCH-LM test (χ^2 = 0.5648, with P-value 0.4588) explicates that the model is free from heterogeneity. Moreover, the result of the BPG and BG test indicates that

the ARDL does not have any serial correlation problem as indicated by insignificant p-value for both of these statistical tests.

Fig. 2: Result of CUSUM

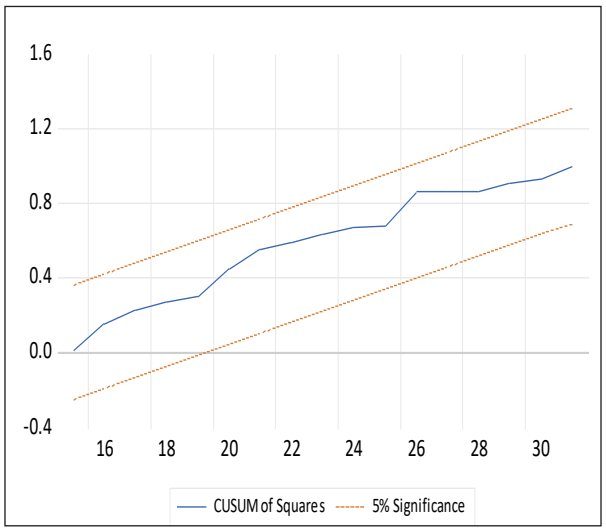

Fig. 3: Result of CUSUMSQ

The result of the Ramsey-Reset test ($\chi^2 = 0.3508$, with P-value 0.5620) indicates that the model is free from misspecification and the dependent and independent variables are linear with no omitted variables for the empirical estimations. Furthermore, to confirm the stability of the model, the study has employed the stability test of the short and long run coefficient using CUSUM and CUSUM squared as presented in Fig. 2 and Fig. 3. The h_0, which asserts that all coefficients in the ECM are stable, cannot be rejected if the plot of CUSUM and CUSUMQ statistics stays under the critical bound of 5% level. The graph of recursive residuals as displayed in Fig. 2 and 3 indicates that the residuals are inside the critical bound indicating the stability of the ARDL model.

CONCLUSION AND POLICY IMPLICATIONS

The study attempts to explore the conventional, economic policy, financial and social determinants of the direct tax collection of the government in India by cataloging some factors that may account for determinants of direct tax revenue of the government in India. The relationship between tax revenues and their determinants is of immense importance for governments and, indirectly, for central banks, whose primary aim is to accomplish and maintain financial stability in the economy. The empirical result of the ARDL model implies that in conventional factors, the contribution of the agriculture sector in India's sectoral composition has a negative and statistically significant impact on direct tax revenue collection of the government due to the under-tax of this sector in India. Conversely, trade openness has positive and statistical significant impact on the tax revenue collection of the government in India. Thus, the result depicts that the agriculture sector should be brought under the ambit of the taxation system to boost the tax collection of the government. Moreover, the increase in the proportion of formal activities, that is, manufacturing sector in the sectoral composition of the country in contrast to the informal sector will boost the tax collection of the government in India. On the contrary, the increase in urbanisation rate has a statistically significant and positive impact on the tax revenue collection of the government in the short and long run. Similarly, in financial variables, the CDR of schedule commercial banks and FIND has positive impact on the tax revenue of the Indian government. However, the coefficient of the CDR is insignificant but positive. Thus, the results for financing variables depict that the FIND in the country will boost the tax collection of the government in India. On the contrary, in economic policy factors, the foreign direct investment, NODAU has positive but statistical insignificant impact on the direct tax revenue of the government in India. Moreover, M2 has positive and statistical significant impact in short and long run on direct tax revenue collections of the government in India. Moreover, the ECT_{t-1} term of the short run ARDL model is statistically significant and carries a negative sign, which demonstrates the long-run association in the variables of the study. The exchange rate depicts a negative but statistical insignificant relationship with the tax revenue of the government in India. Thus, the result depicts that the government should focus on the openness of the Indian economy, development of the financial system in India, broad money supply, increasing urbanisation rate and

tax literacy among taxpayers to boost the direct tax revenue of the government in India. On the contrary, the government should try to keep a check on tax evasion through the agriculture sector in India and to increase the ambit of direct tax to the agriculture sector in India as the agriculture sector contribution in sectoral composition has a depressing impact on the direct tax revenue of the government. Furthermore, there is a need to work on widespread tax evasion by the government for strengthening tax efforts as taxpayers usually reduce their tax liabilities by claiming bogus expenses and under-claiming their receipts. Since the government of India has implemented the GST in India, therefore, there is a need to study the determinants of indirect tax revenue of the government in India also which may be accomplished by taking this study as a base study. Thus, the current study will act as a guide for governments, policymakers the sittings of the finance commission and CBDT in India for formulating policies on direct tax revenue. Moreover, the current study can be taken as a base for conducting future studies at national and international levels for determinants of various taxation revenues of governments around the globe.

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