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What India's Tax/GDP ratio convey?

With the Union Budget being round the corner, one of the important ratios to watch out for is the tax to GDP ratio. There are different literature on narratives on the relationship between tax collections and GDP. Here from a theoretical perspective we tried to capture the following:

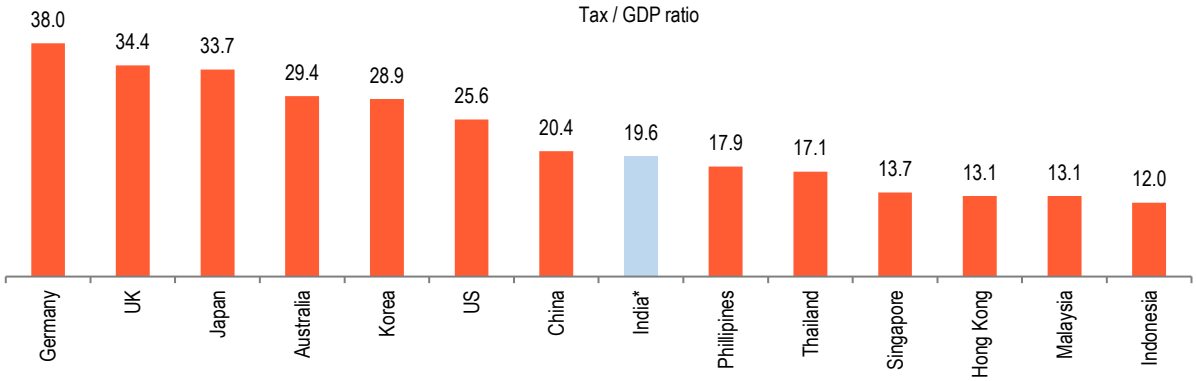
1. How India's Tax to GDP ratio is positioned compared to major economies?
2. What has been the historical trend between India's Gross Tax Revenue and Nominal GDP?
3. Whether any empirical relationship persists between the two?

India versus the world

India's Gross Tax revenue of Centre to GDP is lower at 11.7%, but accounting for both Centre and States, the ratio is at 19.6% which is at par with major economies (**Fig 1**). In fact, for other Emerging Markets (EMs), such as Hong Kong, Malaysia and Indonesia, the ratio is far lower. However, Advance Economies (AEs), stand out. For Germany, it is as high as 38%. For US, it is at 25.6%. This is important from policy standpoint as India has much larger potential from the angle of favourable demographics. With more efforts being directed towards holistic tax reforms in the form of simplification, rationalization and digitization, there are signs of improving tax to GDP ratio in the near term.

The past few years have witnessed important regulatory changes ranging from enacting the Income Tax Act 2025 (effective from 1 Apr 2026), to rationalization of corporate tax structure, ratifying the OECD/G20 Base Erosion and Profit Shifting (BEPS) Multilateral Instrument (MLI) in 2019 to combat tax avoidance, bringing in place Vivad se Vishwas scheme (VSV Scheme) focusing solely on dispute resolution. All aimed at improving transparency and streamlining compliance procedures. Hence the benefit of these structural measures is soon to show their effect.

Fig 1. For India, there remains potential for increasing the tax to GDP ratio



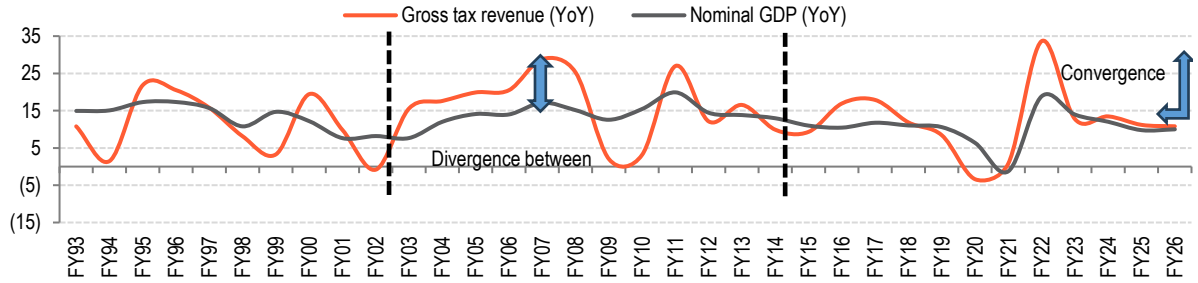
Source: OECD, Union Budget, Bank of Baroda Research, Note: For majority of the country's 2024 figure is provisional data, *For India both state and centre have been considered

Tax collections and Nominal GDP moving in consonance

Apart from the structural measures, does tax collection have any relationship with any macroeconomic variable. There is varied literature attributing long run relationship between tax collection and GDP (Lum Çollaku, Driton Balaj, Artan Hajdini, 2023). Widmalm (2001) established a negative relationship between taxes and economic growth for 23 OECD countries. Romer and Romer (2010) studied the impact of tax reforms on U.S. economic performance and concluded tax reforms had positive impact on growth of US.

Fig 2. Shows historical movement in growth rate of India's Gross tax revenue collections and nominal GDP. Three episodes emerge 1) **FY93-FY02**, where gross tax revenue collections have been broadly volatile on account of narrow tax base 2) **FY03-FY13**, showed initial divergence between nominal GDP growth rate and tax collections and 3) **From FY14 till date**, there has been visible signs of convergence between Gross tax revenue collections and nominal GDP with convergence being more pronounced from FY23 onwards. The Covid-period witnessed some aberrations.

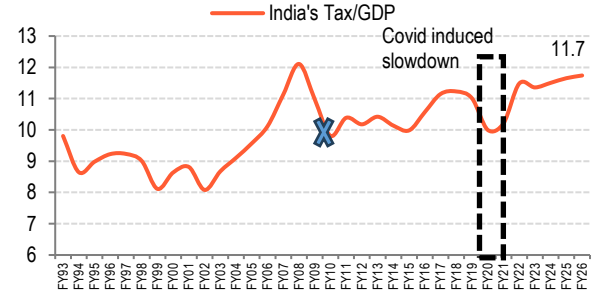
Fig 2. Directional convergence between growth in nominal GDP and tax collections



Source: CMIE, Union Budget, Bank of Baroda Research, Note: FY25RE, FY26BE

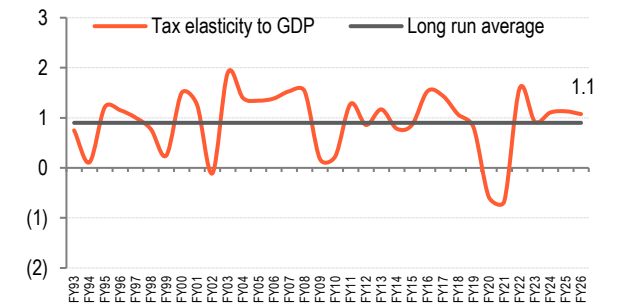
India's tax to GDP ratio has shown sharp correction since Covid period. It is currently at 11.7 and the tax elasticity is running above long run average at 1.1. Further with more labour reforms, formalization of the economy, simplification of India's tax structure and leveraging technology, we expect the buoyancy to pick up at a sharper pace. FY27 is expected to be the year of revival of India's consumption curve as the past reforms of rejig in income tax structure, ongoing GST reform and benign inflation, will act concomitantly towards stimulating consumption demand and indirectly is expected to contribute towards effective pickup in tax buoyancy, going forward.

Figure 3: India's Tax to GDP ratio picked up significantly since Covid period



Source: CMIE, Union Budget, Bank of Baroda Research, Note: FY25RE, FY26BE

Figure 4: Tax elasticity to GDP running above long run average



Source: CMIE, Union Budget, Bank of Baroda Research, Note: FY25RE, FY26BE

Does any empirical relationship exist?

The next exercise tries to draw an empirical relationship between different components of Gross Tax revenue collections. For example, income tax collections are mapped with nominal GDP as tax and economic activity theoretically should have some coherence. Customs to import growth and corporation tax and growth in profit before tax of corporates have also been examined.

There exists strong positive correlation coefficient of income tax to per capita income as well as income tax to nominal GDP. For customs to imports it is at 0.37 and for Corporation tax to PBT, it is at 0.30. If looked at from the aspect of buoyancy, for income tax to per capita income it is significantly higher currently compared to long run average level. The same is for income tax to nominal GDP, speaking of improving economic activity acting positively on the tax collection numbers. The buoyancy of corporate tax to profit before tax is also high compared to long run average. This shows that improving financial earnings of corporates have been positive for corporate tax collection.

Figure 3: Strong correlation between nominal GDP and income tax collections

Correlation	FY93-Till date
Gross Tax to GDP	0.61
Income tax to per capita income	0.57
Income tax to Nominal GDP	0.55
Income tax to Real GDP	0.52
Service tax to Services GDP	0.30
Customs to Imports at current prices	0.37
Corporation tax to PBT	0.30

Source: CMIE, Union Budget, Bank of Baroda Research

Figure 4: Tax buoyancy currently is above Long-run (LR) average

Correlation	Current tax buoyancy	LR average
Gross Tax to GDP	1.14	0.96
Income tax to Nominal GDP	1.93	1.37
Income tax to per capita income	2.16	1.60
GST to Services GDP at current price	1.03	1.57
Customs to Imports	0.08	0.01
Corporation tax to PBT	0.84	-0.63

Source: CMIE, Union Budget, Bank of Baroda Research

The correlation coefficient established that there exists a strong positive correlation between tax collections and GDP. However further to examine the causality, we conduct the **Granger Causality test**. Here we have taken 35 observations (FY93-FY26) into account. The prerequisite of series being stationary has been fulfilled and the series turns out to be stationary in its first difference.

Null Hypothesis:	F-Statistic	Prob.
D(TAX) does not Granger Cause D(GDP)	18.4	**0.00**
D(GDP) does not Granger Cause D(Tax)	16.8	**0.00**

Note: D(GDP): First difference of GDP, D(Tax): First difference of Gross Tax Revenue

Thus, as per results, *Tax does Granger Cause GDP, and GDP does Granger Cause Tax*. To further check whether the relationship is spurious or not, we have used the concept of cointegration. Here, as seen before performing Granger causality test that both Tax &GDP ~I (1) [Integrated of order 1] and the error term is I (0) i.e. stationary **(Appendix 1)**.

However, OLS estimates give hint of spurious regression as t-statistic is very high, R2>Durbin Watson stat **(Appendix: 2)**. Here we use log scale of GDP and Tax for better interpretation of result especially the coefficient. To further establish whether the series are cointegrated or not, we run the

cointegration regression and Engle Granger and Phillips Ouliaris tests, **both of which convey that series are cointegrated, not confirming any long run relationship (Appendix 3).** Thus**,** gross tax revenue is more dependent on structural factors which are contingent on reforms focusing on improving tax base, efficiency in collection and simplification in tax structure. India with its ongoing reforms in place is solely targeting the correct epicenter.

To sum up:

- India's Tax to GDP ratio is in line with major economies. In fact, compared to major Ems, it is far higher. Further with favourable demographics, India has immense potential. The ongoing reform in place is already focused on simplification, rationalisation and transparency in tax structure. This will act positively on the tax numbers going ahead.
- So, an attempt is made to see the determinants of India's Gross Tax collection. It is seen that there exists a directional convergence between Gross tax collections and nominal GDP. The convergence is more pronounced from FY14 onwards.
- Empirical relationship also shows strong positive correlation coefficient between nominal GDP and income tax collection, customs to imports and corporation tax to PBT.
- The current tax buoyancy numbers of Income tax to Nominal GDP, Income tax to per capita income, Corporation tax to PBT is also significant when compared to long run average.
- Further to establish the causality between gross tax collections and nominal GDP, Granger Causality Test have been conducted which shows that Tax does Granger Cause GDP, and GDP does Granger Cause Tax.
- However, on further validating whether any cointegrating relationship exists between the two variables, it is found to be not significant. This confirms the fact that tax collections are more contingent on structural reforms. India has already seen a host of changes on this front and with the new Income Tax Act 2025 coming into effect and changes in indirect tax structure, the tax collections number is expected to show improvement.

Appendix 1.

	Null Hypothesis	t-Stat	Prob
Augmented Dickey-Fuller test statistic	LGDP has a unit root	-1.72	**0.72**
	LTax has a unit root	-2.17	**0.49**
	Residuals has a unit root	-3.17	**0.00**
	First Difference		
	LGDP has a unit root	-4.1	**0.01**
	LTax has a unit root	-5.3	**0.00**

Note: LGDP: Log scale of GDP, LTax: Log scale of Gross Tax Revenue

Appendix 2: OLS Results

Variable	Coefficient	Std. Error	t-Stat	Prob
C	-3.49	0.19	-18.15	0.00
LGDP	**1.07**	0.01	99.02	0.00
R-squared	**0.997**	-	-	-
Prob(F-statistic)	0	-	-	-

Appendix 3:

Null hypothesis: Series are not cointegrated	Value	Prob
Engle-Granger tau-statistic	-3.17	0.10
Engle-Granger z-statistic	-13.46	**0.14**
Phillips-Ouliaris tau-statistic	-3.29	0.08
Phillips-Ouliaris z-statistic	-14.62	**0.11**

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