Revenue Performance Assessment of Indian GST

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Abstract

By comparing comparable revenue streams of pre- and post-GST periods, in this paper we assess the revenue performance of GST in India for the period 2012-13 to 2022-23. Sustaining revenue streams of the Union and State governments (in terms of percentage share in nominal Gross Domestic Product or GDP) between the pre- and a post-GST period is important for sustainable Public Finance Management. We observe that post-GST tax buoyancy in the GST regime has improved for the Union, state and general governments. The GST-to-GDP ratio of the Union as well as state governments has not yet improved during the post-GST period as compared to the equivalent share of respective revenue streams in GDP during the pre-GST period. Based on available information, we estimate C-efficiency ratio (or collection efficiency), Effective Tax Rates, Compliance Gap and Policy Gap of GST for the period Q2:2017-18 to Q3:2022-23. We find that average C-efficiency of GST is 0.54 (or 54%) which is in line with available evidence from developing Asian countries. Average ETR has gone up from 10.91 per cent in 2020-21 to 12.21 per cent in 2021-22 and 12.56 per cent up to Q3:2022-23 of 2022-23. The share of policy gap in C-efficiency is higher than compliance gap which is in line with available evidence from EU and OECD countries.

Key Words: Revenue performance assessment, Goods and Services Tax (GST), C-efficiency, Compliance Gap, Policy Gap, Effective Tax Rate (ETR), India.

JEL Codes: H20, E62, H26

1.   Introduction

Indian Goods and Services Tax (GST) regime has completed five years on 30 June 2022. Like the world economy, Indian economy has also faced economic slowdown during 2020-21 due to the COVID-19 pandemic. We observe that prior to the pandemic, during Q4:2018-19 to Q4:2019-20, average quarterly (Year-on-Year) growth rate of nominal GDP (at market prices) falls to 5.93 per cent from the average quarterly growth rate of 11.42 per cent during Q1:2015-16 to Q3:2018-19. The impact of slowdown of economic growth on consumption expenditure was relatively weaker during Q4:2018-19 to Q4:2019-20 as compared to the pandemic period (i.e., Q1 & Q2 of 2020-21) (Figure 1).[1] Indian economy shows sharp recovery (both in nominal GDP and consumption expenditures) after the pandemic. However, during Q2 to Q4 of 2021-22, economic growth again falls and it is partly attributed to second wave of the COVID-19 pandemic and associated economic restrictions. Highest economic growth recorded in Q1:2021-22 is also related to lower base affect due to the pandemic. Consumption being the tax base of GST, any volatility in consumption expenditures is expected to make GST collection vulnerable to shocks (or volatile), at least collection in the domestic portion of GST.

Figure 1: Quarterly (Year-on-Year) Growth Rate of GDP (nominal, at market prices) and Consumption Expenditures (%)*
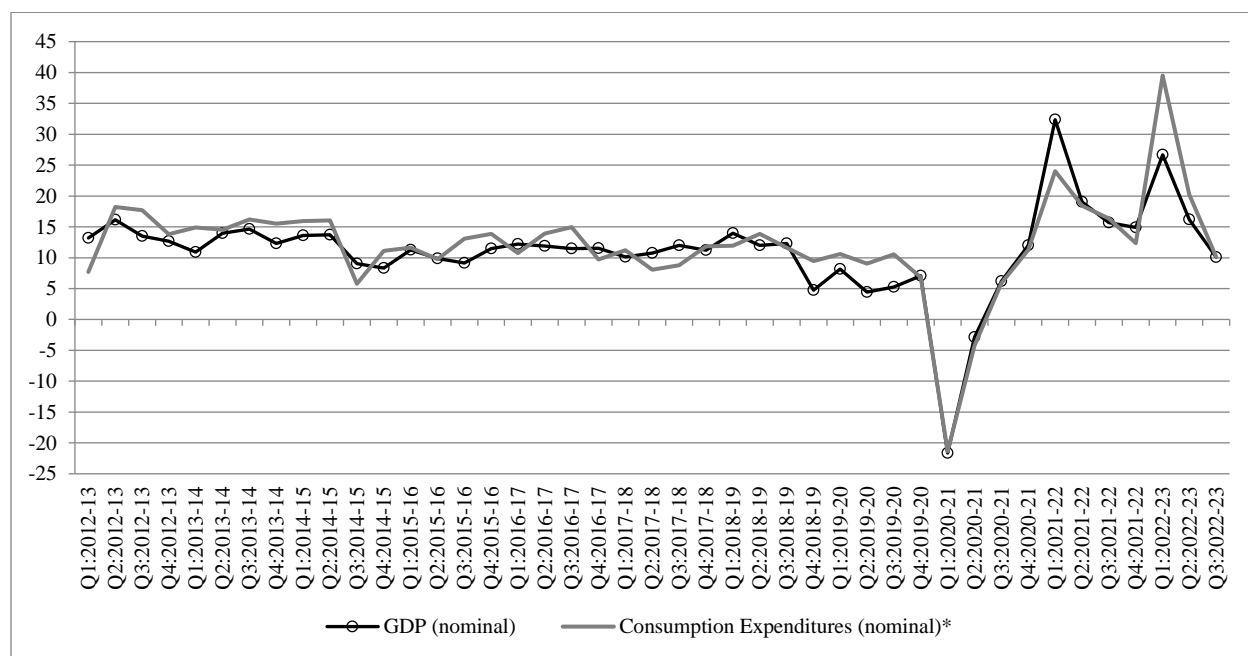

Note: *-Consumption expenditures include Private Final Consumption Expenditure (PFCE) and Government Final Consumption Expenditure (GFCE) at current prices
Source: Compiled from EPWRF India Time Series Database

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[1] By consumption expenditures, we mean combined Private Final Consumption Expenditure (PFCE) and Government Final Consumption Expenditure (GFCE).

We have observed volatility in GST collection during the post-pandemic period and it is largely related to volatility in the consumption expenditures (Figure 1 & 2). During pre-pandemic period (i.e., Q3:2017-18 to Q4:2019-20), the range of GST collection (as % of nominal GDP) was 5.8 to 6.4 per cent and during the post-pandemic (i.e., Q3:2020-21 to Q3:2022-23), it is 6 to 7 per cent (Figure 3). Therefore, we observe a marginal improvement in the GST collection after the pandemic. Similarly, during the pre-pandemic period GST collection (as % of consumption expenditures) used to vary between 8 to 9.2 per cent and the range is 8.2 to 9.6 per cent during the post-pandemic period. An in-depth assessment of the revenue performance of GST may help us to understand expected future stream of revenue from GST, given the importance of the revenue source in Public Finance Management of the Union and state governments.

Figure 2: Quarterly (Year-on-Year) Growth Rate of GST Collection
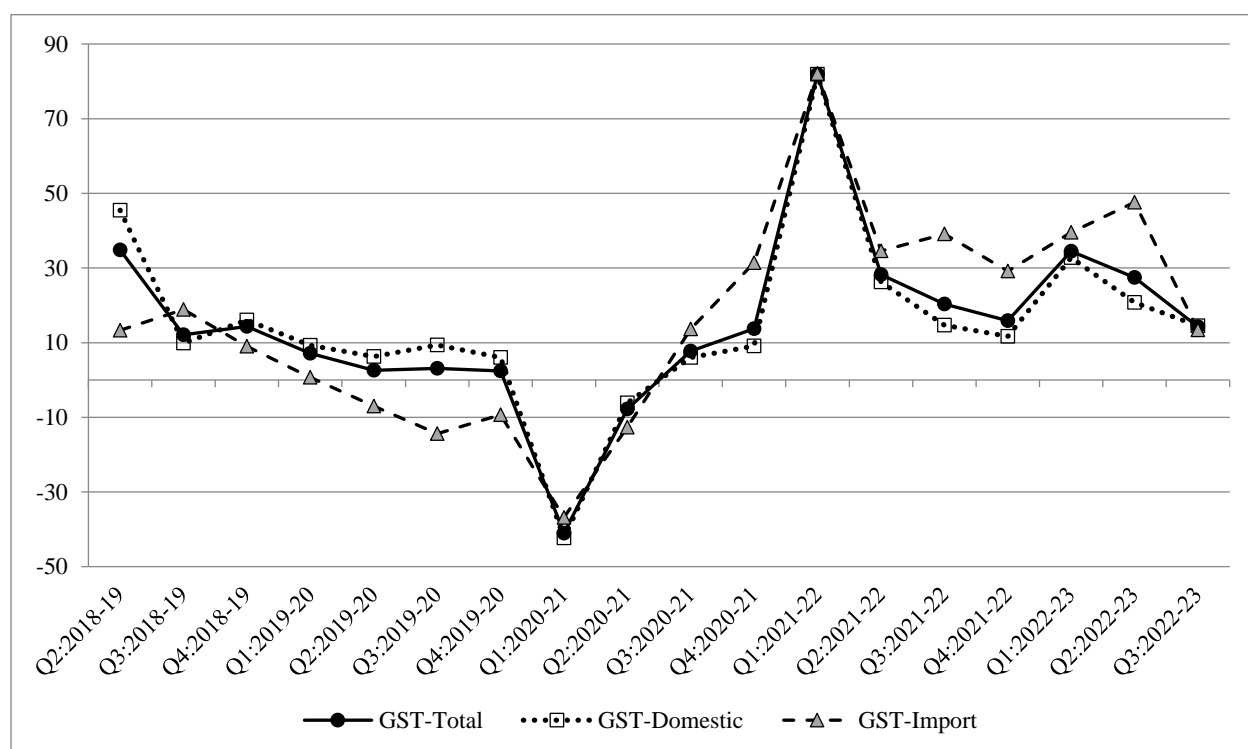
Source: Compiled from Monthly Press Releases of Department of Revenue, Government of India.

For both the Union and state governments, many taxes are subsumed into GST. By comparing revenue streams of taxes subsumed into GST for the pre-GST period with GST collections of the Union and state governments during Q2:2017-18 to Q3:2022-23, we assess the revenue performance of GST.

In the section, we assess the revenue performance of GST by estimating tax buoyancy and the share of subsumed taxes vis-à-vis GST collection in GDP. In section three, we estimate C-efficiency ratio, Effective Tax Rates (ETRs), compliance gap and policy gap of Indian GST. In section four, we draw our conclusions.

Figure 3: Trends in GST Collection (as % of Nominal GDP and Consumption*)
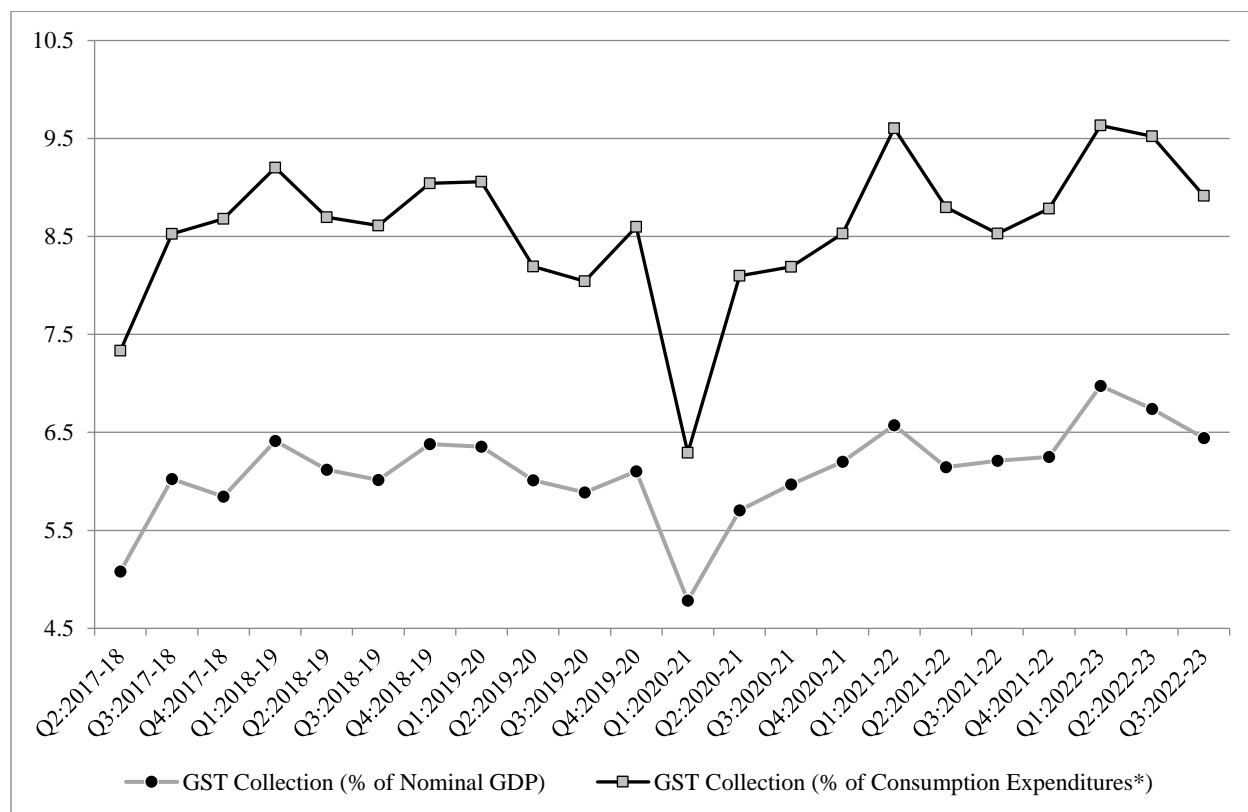
Note: *-Consumption expenditures include Private Final Consumption Expenditure (PFCE) and Government Final Consumption Expenditure (GFCE)
Source: Compiled from Monthly Press Releases of Department of Revenue, Government of India and EPWRF India Time Series Database

2.   Performance Assessment of GST: Estimation of Tax Buoyancy

Revenue stream of state taxes subsumed into GST is available for the period 2012-13 to 2017-18 (upto 30 June 2017) from GST Portal.[2] However, the same information is available only for 2015-16 (i.e., the base year for GST compensation) for three states (viz., Arunachal Pradesh, Gujarat and Haryana). For them, we estimate the revenue for other years. In 2015-16, aggregate revenue of the 3 missing states accounts for 12.56 per cent of aggregate revenue of rest of the other states, so we take additional 12.56 per cent of aggregate revenue of other states to get aggregate revenue of all states for other data points. We present it as "Augmented total states' taxes subsumed in GST" in Table 1.

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[2] https://tutorial.gst.gov.in/offlineutilities/gst_statistics/Yearwise-Pre-GST-revenue.pdf (last accessed on 11 March 2023)

Unlike state governments, revenue stream of the Union taxes that is subsumed into GST is not readily available. To estimate this we depend on the Union Budget Documents and information provided by Mukherjee (2021). We describe the process in Appendix A.

Table 1 shows that average annual share of subsumed state taxes in GST was 3.02 per cent of nominal GDP during 2012-17 (Table 1). On average subsumed Union taxes used to contribute 3.11 per cent of GDP during 2012-17. Total subsumed taxes in GST (combined Union and state taxes) used to contribute 6.13 per cent of GDP during 2012-17. Average tax buoyancy of subsumed taxes was 1.04 with respect to nominal GDP and 1.11 with respect to nominal GVA.

Table 1: Revenue Performance of Taxes Subsumed into GST - Pre-GST Period (2012-13 to 2016-17) (INR trillion)

Revenue Stream	2012-13	2013-14	2014-15	2015-16	2016-17	Average of 2012-13 to 2016-17	Source
State taxes subsumed in GST							
1. Subsumed total state tax collection on GST portal	2.862	3.087	3.318	3.973	3.919	3.432	(a)
2. Augmented total states' taxes subsumed in GST*	3.221 (3.240)	3.475 (3.094)	3.735 (2.996)	3.973 (2.885)	4.412 (2.866)	3.763 (3.016)	
Central Taxes subsumed in GST							
3. Union Excise Duties (on goods subsumed under GST, including cesses)**	0.751	0.710	0.691	0.959	1.433		(b)
4. Service Tax**	1.326	1.548	1.680	2.114	2.545		(b)
5. Customs (CVD, SAD & Cesses thereunder)**	1.009	1.055	1.160	1.289	1.434		(b)
6. Total Union taxes subsumed in GST (3+4+5)	3.086 (3.103)	3.313 (2.949)	3.530 (2.832)	4.362 (3.168)	5.413 (3.517)	3.941 (3.114)	
7. Total taxes subsumed in GST (2+6)	**6.307 (6.342)**	**6.788 (6.043)**	**7.265 (5.827)**	**8.336 (6.053)**	**9.824 (6.383)**	**7.704 (6.130)**	
8. Nominal GDP	99.440	112.335	124.680	137.719	153.917		(c)
9. Growth rate in total taxes subsumed in GST (Sl. No. 7) (%)		7.628	7.035	14.732	17.855		
10. Growth rate in Nominal GDP (%)		12.968	10.989	10.458	11.762		
11. Tax Buoyancy of Sl. No. 7 w.r.t. Nominal GDP		0.588	0.640	1.409	1.518	**1.039**	
12. GVA at Basic Prices (Nominal)	92.027	103.632	115.043	125.745	139.652		(c)
13. Growth rate of Nominal GVA (%)		12.610	11.011	9.303	11.060		
13. Tax Buoyancy of Sl. No. 7 w.r.t Nominal GVA		0.605	0.639	1.584	1.614	**1.110**	

Notes: *-Except for 2015-16, revenue from taxes subsumed into GST is not available for Arunachal Pradesh, Haryana and Gujarat for other data points. In 2015-16, aggregate revenue of the 3 missing states accounts for 12.56 per cent of aggregate revenue of rest of the other states, so we take additional 12.56 per cent of aggregate revenue of other states to get aggregate revenue of all states for other data points.
**-for details see Appendix A.
Figures in the parenthesis show the percentage share in Nominal GDP.
Sources: (a) GST Portal (https://tutorial.gst.gov.in/offlineutilities/gst_statistics/Yearwise-Pre-GST-revenue.pdf)
(b) Computed by authors based on Receipts Budget (Tax Revenue) of the Union Budget (various years) (also see discussion below)
(c) EPWRF India Time Series Database

It is to be highlighted that like state taxes United Territory (UT) taxes are also subsumed into GST. However, except UTs with legislature (viz., Delhi, Puducherry and Jammu & Kashmir), we do not include revenue stream of corresponding UT taxes in Table 1. To make the revenue streams comparable between pre- and post-GST periods, we exclude UT-GST collection (including IGST settlement on UT-GST account) from Table 2 (see Appendix B for details).

The share of total GST collection (including GST on imports but excluding UT-GST components) is 6.16 per cent GDP (Table 2). This shows marginal improvement over the equivalent pre-GST revenue of 6.13 per cent of GDP (Table 1). However, post-GST figures include GST compensation cess collection. If we exclude average annual share of GST compensation cess collection (i.e., 0.48% of GDP), it falls below the average share of pre-GST revenue. Average Tax buoyancy of GST with respect to nominal GDP is 1.18 during 2018-23 (excluding 2020-21) and it shows a marginal improvement over the pre-GST average tax buoyancy (i.e., 1.04). Average tax buoyancy with respect to nominal GVA is 1.18 and it also shows an improvement over the pre-GST average (i.e., 1.11). It is to be highlighted that average tax buoyancy of sum of domestic components of GST is higher than total GST. The reason is that growth in GST from imports was lower before the pandemic period as compared to growth rate of domestic components of GST. Post-pandemic, growth rate of GST from imports is higher than growth rate in domestic components of GST and it is clearly visible from tax buoyancy figures of GST (Total) in Table 2 for the period 2021-23. Post-pandemic higher international prices of goods and services is one of the factors behind such improvement in tax buoyancy.

Table 2: Revenue Performance of GST - Post-GST Period (2016-17 to 2022-23) (INR trillion)

Description	2018-19	2019-20	2020-21	2021-22	2022-23	Average
14. Total GST Collections (domestic supplies)[a]	8.768	9.444	8.658	11.019	13.179*	10.214
15. Total GST Collections (including GST on imports)[a]	11.774	12.221	11.368	14.873	17.956*	13.638
16. Total GST Collection (including GST on imports but excluding UT-GST Components)$	11.731 (6.207)	12.173 (6.064)	11.322 (5.718)	14.809 (6.258)	17.884 (6.549)	13.584 **(6.159)**
17. Nominal GDP[b]	188.997	200.749	198.009	236.646	273.078	
18. Growth Rate of GST (Domestic) (%) (Sl. No. 14)		7.711	-8.319	27.267	19.596	
19. Growth Rate of GST (Total) (%) (Sl. No. 15)		3.801	-6.982	30.833	20.725	
20. Growth Rate of GST (Total, without UT-GST) (%) (Sl. No. 16)		3.775	-6.995	30.796	20.767	
21. Growth Rate in Nominal GDP (%)		6.218	-1.365	19.513	15.395	
22. Buoyancy of GST (Domestic)		1.240	**6.096**	1.397	1.273	1.303#
23. Buoyancy of GST (Total)		0.611	**5.116**	1.580	1.346	1.179#
24. Buoyancy of GST (Total, Without UT-GST)		0.607	**5.126**	1.578	1.349	**1.178#**
25. GVA at Basic Prices (Nominal)[b]	171.751	183.551	180.578	213.494	247.262	
26. Growth Rate of Nominal GVA		6.870	-1.620	18.228	15.817	
27. Buoyancy of GST (Total) w.r.t. Nominal GVA		0.553	4.310	1.692	1.310	1.185#
28. Buoyancy of GST (Total, without UT-GST) w.r.t. Nominal GVA		0.549	4.319	1.689	1.313	1.184#

Note: *-Actual GST collection during April 2022 to February 2023 and for March 2023, we have extrapolated it by taking average monthly GST collection during April 2022 to February 2023.
$- Please see Appendix B for details. #- Average of 2019-20 & 2021-22 to 2022-23
Sources: (a) Compiled from Monthly Press Releases of the Department of Revenue, Ministry of Finance, Government of India.
(b) EPWRF India Time Series Database

The revenue impact of GST on sub-national finances will depend not only on states' own revenue performance but also on revenue performance of the federal government, as the latter may spill-over to sub-national finances through tax devolution. In other words, revenue implications of any tax reform may be felt differently by different levels of governments and across sub-national governments in a federal system. We present the pre-GST revenue streams of states from own sources of revenue as well as the states' share in the Union taxes pertaining to taxes subsumed into GST in Table 3. It shows that on average state revenue corresponding to state taxes subsumed into GST and state's share in the Union taxes (corresponding to Union taxes subsumed into GST) used to contribute 4.15 per cent of GDP during 2012-17. On average pre-GST tax buoyancy was 1.1 with respect to nominal GDP and 1.2 with respect to nominal GVA.

Table 3: Pre-GST Total Revenue of States from Taxes Subsumed in GST: Own Tax and States' Share in the Union Taxes (INR. Trillion)

Description	2012-13	2013-14	2014-15	2015-16	2016-17	Average
State taxes subsumed in GST (A)	3.221	3.475	3.735	3.973	4.412	3.763
Central taxes subsumed in GST (B)	3.086	3.313	3.530	4.362	5.413	3.941
Devolution factor (C)	0.32	0.32	0.32	0.42	0.42	
Total fiscal resources to States from taxes subsumed in GST (A+B*C)	4.209 [4.232]	4.535 (7.759) [4.037]	4.865 (7.266) [3.902]	5.806 (19.338) [4.216]	6.685 (15.146) [4.343]	5.220 [4.146]
Nominal GDP	99.440	112.335 (12.968)	124.680 (10.989)	137.719 (10.458)	153.917 (11.762)	
Pre-GST buoyancy of revenue from taxes subsumed in GST accruing to states w.r.t. Nominal GDP		0.598	0.661	1.849	1.288	1.099
GVA at Basic Prices (Nominal)	92.027	103.632 (12.610)	115.043 (11.011)	125.745 (9.303)	139.652 (11.060)	
Pre-GST buoyancy of revenue from taxes subsumed in GST accruing to states w.r.t. Nominal GVA		0.615	0.660	2.079	1.369	1.181

Notes: Figures in the parenthesis shows the annual growth rate (in %)
Figures in the bracket show the percentage share in Nominal GDP

Revenue impact of GST on state finances depends not only on state GST collection (including IGST settlements on SGST account) but also on tax devolution that states' receive from the Union government. It is expected that if there is any shortfall in the Central GST collection (including IGST settlements on CGST account), it will spill-over to state finances in terms of lower devolution of the Union taxes (related to GST). Therefore, it is ideal to consider both states' own GST (i.e., SGST) as well as states' share in the Union taxes in revenue performance assessment of GST.[3]

We present revenue streams related to GST for states for the post-GST period in Table 4. In addition to state GST, we include states' share in CGST, services tax and GST compensation receipts (from GST compensation fund as well as back-to-back loans in lieu of shortfall in GST cess collection). Table 4 shows that without GST compensation receipts average share of total state revenue (related to GST) becomes 3.63 per cent of nominal GDP (Sl. No. 1 in Table 4) and it is lower than the share that was prevalent during the pre-GST period (i.e., 4.15% of GDP). With GST compensation (from all sources) average share of aggregate state GST basket of revenue reaches to 4.37 per cent of GDP (Sl. No. 3) and it is marginally higher than the average pre-GST share. Therefore, GST compensation payments helped states to sustain the revenue stream which was prevalent during pre-GST period.

If we exclude tax buoyancy of 2020-21, average tax buoyancy during post-GST period is 0.903 (without GST compensation) and 1.07 (with GST compensation from GST compensation fund) (Table 4, page no. 11). Therefore, average tax buoyancy during post-GST period is lower than pre-

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[3] It is to be highlighted that during 2017-18 to 2018-19, a part of IGST settlement to states was based on tax devolution formula recommended by the Fourteenth Finance Commission.

GST period (i.e., 1.18) for states. Fall in growth rate of GST basket of revenue in 2019-20 has resulted in fall of tax buoyancy in 2019-20 which has an impact on overall tax buoyancy. Post-GST (with compensation from all sources) tax buoyancy is lower than post-GST without compensation, because states received back-to-back loans during 2020-22 which cease to exist after 30 June 2022 and it reduces terminal year's tax buoyancy. The impact of COVID-19 pandemic on growth rate of GDP as well as on the growth rate of GST collection is clearly visible from Table 4. Therefore, achieving macroeconomic stabilization of the economy would be important for stabilization of the GST system in India. Post GST compensation period sustaining revenue stream of GST basket of revenue would be important for states to contain revenue as well as fiscal deficits.

On average the Union taxes (net to Centre) subsumed in the GST used to contribute 1.98 per cent of GDP during 2012-17 (Table 5). Average tax buoyancy of subsumed taxes was 0.932 during 2012-17. Average share of GST basket of revenue of the Union government is 1.50 per cent of GDP during post-GST period (Table 6, page no. 12). This shows that there is a fall in the average share of revenue for the Union government from GST during post-GST period as compared to the pre-GST average share of the Union taxes (net to Centre) subsumed in GST. We observe that there is a substantial increase in average tax buoyancy of the Union basket of GST during post-GST period (excluding tax buoyancy of 2020-21). Volatility of tax buoyancy during the post-GST period is attributed to volatility of growth rate in GDP and resulting volatility in GST collections. Volatility in tax buoyancy makes it difficult to make reliable projection of tax revenue and therefore it may result in revenue shocks to public finance management.

Table 5: Pre-GST Net Revenue of the Union Government from Taxes Subsumed in GST (INR. Trillion)

Description	2012-13	2013-14	2014-15	2015-16	2016-17	Average
Central taxes subsumed in GST (Gross) (A)	3.086	3.313	3.530	4.362	5.413	3.941
1-Devolution Factor (B)	0.68	0.68	0.68	0.58	0.58	
Central Taxes subsumed in GST (Net to Centre) (A*B)	2.098 [2.110]	2.253 (7.366) [2.005]	2.401 (6.569) [1.925]	2.530 (5.398) [1.837]	3.139 (24.070) [2.040]	2.484 **[1.984]**
Nominal GDP	99.440	112.335 (12.968)	124.680 (10.989)	137.719 (10.458)	153.917 (11.762)	
Tax Buoyancy w.r.t. Nominal GDP		0.568	0.598	0.516	2.046	**0.932**

Notes: Figures in the parenthesis shows the annual growth rate (in %). Figures in the bracket show the percentage share in Nominal GDP
*-Tax Buoyancy w.r.t. CAGR

Table 4: Post-GST Total Revenue of States from GST: Own Tax and States' Share in the Union Taxes (INR. Trillion)

Description	2018-19	2019-20	2020-21	2021-22	2022-23(RE)	Average	Source
SGST (including IGST Settlement and IGST Share to States)*	5.164 [2.732]	5.052 (-1.975) [2.516]	4.633 (-8.291) [2.340]	6.379 (37.684) [2.695]	7.657 (20.038) [2.804]	5.777 **[2.618]**	(a)
CGST (Gross) (including IGST settlement on CGST account)	4.575 [2.421]	4.941 [2.461]	4.563 [2.305]	5.912 [2.498]	7.168 [2.685]	5.432 [2.462]	(b)
CGST Share to States	1.880	1.846	1.765	2.528	2.919	2.188	(c)
Service Tax Share to States	0.069	0.000	0.026	0.119	0.004		(c)
GST Compensation Payments	0.701	1.218	1.367	0.975	1.157		(e)
Back-to-Back Loans				1.102	1.590		(f)
Total fiscal resources to stares from the GST system							
(1) SGST (including IGST settlement & share)+ Devolution from CGST & Service Tax	7.112 [3.763]	6.898 (-3.013) [3.436]	6.424 (-6.879) [3.244]	9.027 (40.523) [3.814]	10.580 (17.206) [3.874]	8.008 **[3.626]**	
(2) SGST (including IGST settlement & share)+ Devolution from CGST & Service Tax+ GST Compensation	7.813 [4.134]	8.116 (3.882) [4.043]	7.791 (-4.010) [3.935]	10.002 (28.378) [4.226]	11.736 (17.345) [4.298]	9.092 **[4.127]**	
(3) SGST (including IGST settlement & share)+ Devolution from CGST & Service Tax+ GST Compensation + Back-to-Back loans	7.813 [4.134]	8.116 (3.882) [4.043]	8.893 (9.569) [4.491]	11.592 (30.348) [4.898]	11.736 (1.249) [4.298]	9.630 **[4.373]**	
(4) Nominal GDP (All India)	188.997	200.749 (6.218)	198.009 (-1.365)	236.646 (19.513)	273.078 (15.395)		(g)
(5) GST Buoyancy of Sl. No. (1) w.r.t. Nominal GDP		-0.485	5.041	2.077	1.118	**0.903#**	
(6) GST Buoyancy of Sl. No. (2) w.r.t. Nominal GDP		0.624	2.939	1.454	1.127	**1.068#**	
(7) GST Buoyancy of Sl. No. (3) w.r.t. Nominal GDP		0.624	-7.012	1.555	0.081	**0.754#**	
(8) GVA at Basic Prices (Nominal) (All India)	171.751	183.551 (6.870)	180.578 (-1.620)	213.494 (18.228)	247.262 (15.817)		(g)
(9) GST Buoyancy w.r.t. (Sl. No. 1) w.r.t. Nominal GVA		-0.439	4.247	2.223	1.088	**0.957#**	
(10) GST Buoyancy w.r.t. (Sl. No. 2) w.r.t. Nominal GVA		0.565	2.476	1.557	1.097	**1.073#**	
(11) GST Buoyancy w.r.t. (Sl. No. 3) w.r.t. Nominal GVA		0.565	-5.908	1.665	0.079	**0.770#**	

Notes: *- In 2018-19, a part of IGST settlement was based on tax devolution formula. Figures in the parenthesis show the annual growth rate (in %). Figures in the bracket show the percentage share in Nominal GDP. # Average of 2019-20 & 2021-22 to 2022-23.

Sources:

(a) for 2018-19 to 2020-21, State Finance Accounts & State Budget Documents and for 2021-22 to 2022-23 Monthly Press Releases of the Department of Revenue, Ministry of Finance.[4]

(b) for 2018-19 to 2021-22, Union Finance Accounts and for 2022-23 Controller General of Accounts' Statement of Monthly Accounts.[5]

(c) for 2018-19 to 2021-22, Union Finance Accounts and for 2022-23 estimated based on average states' share in CGST (gross) during 2020-21 and 2021-22.

(d) for 2018-19 to 2021-22, Union Finance Accounts and for 2022-23 it is revised estimate, as available from Receipts Budget of the Union Budget 2023-24 (Annexure- 4A).

(e) for 2018-19 to 2020-21, State Finance Accounts & State Budget Documents and for 2021-22 and 2022-23 Union Budget 2023-24 (Statement of Budget Estimate, Demand No. 35, Department of Revenue, Ministry of Finance).

(f) Union Budget 2023-24 (Receipts Budget, Part-B).

(g) EPWRF India Time Series Database

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[4] Figures include SGST collections (including IGST settlements on SGST account) after deduction of UT-GST collections (including IGST settlements on UT-GST accounts) (as available from Controller General of Accounts' Statements of Monthly Accounts). Since, monthly UT-GST collections are not separately reported in the Press Releases and GST collection data of GST portal reports UTs' GST collections as SGST; we have made the corrections to get SGST figures without UT-GST component.

[5] Monthly Statement of CGST collection (including IGST settlement on CGST account) is available for April 2022 to January 2023. We have projected CGST collections for February and March of 2023, based on average monthly collection of CGST during April 2022 to January 2023.

Table 6: Post-GST Net Revenue of the Union Government from GST (INR. Trillion)

Description	2018-19	2019-20	2020-21	2021-22	2022-23	Average
CGST (Net to Centre) (A)	2.696	3.094	2.799	3.384	4.250	3.244
IGST (Balance left after Settlement & Advance Apportionment to CGST, SGST & UTGST Accounts) (B)	0.1394	0.0913	0.0725	0.0212	0.000	
Service Tax (Net to Centre) (C)	0.0003	0.0603	-0.0100	-0.1093	0.0059	
GST revenue of the Union Government (Net to Centre) (A+B+C)	2.835 [1.500]	3.246 (14.476) [1.617]	2.861 (-11.847) [1.445]	3.296 (15.182) [1.393]	4.256 (29.125) [1.558]	3.299 **[1.503]**
(4) Nominal GDP (All India)	188.997	200.749 (6.218)	198.009 (-1.365)	236.646 (19.513)	273.078 (15.395)	
Tax Buoyancy w.r.t. Nominal GDP		2.328	8.682	0.778	1.892	**1.666#**

Notes: Figures in the parenthesis shows the annual growth rate (in %). Figures in the bracket show the percentage share in Nominal GDP. #- Average of 2019-20 & 2021-22 to 2022-23.
*-Tax Buoyancy w.r.t. CAGR
Source: Computed by Author based on Union Finance Account (various years) and Union Budget 2023-24.

We summarize the above findings in Table 7 for ready reference. It shows that pre-GST average share of revenue from state taxes subsumed into GST was 3.02 per cent of GDP (Row A) whereas average share of State GST (including IGST settlement and share) is 2.62 per cent of GDP (Row F). This shows that without GST compensation, the share of State GST collection in GDP has fallen vis-à-vis the revenue stream of states (in aggregate) that has subsumed into GST. It is to be noted that there is an improvement in average annual tax buoyancy during the post-GST period (from 0.71 to 0.96) for the comparable revenue stream (Row A & F). We observe that average annual share of CGST collection (gross, including IGST settlement on CGST account) is 2.46 per cent of GDP (Row I) whereas the equivalent Central taxes subsumed into GST used to contribute 3.11 per cent of GDP during the pre-GST period (Row B). However, there is a marginal improvement in average annual tax buoyancy (excluding 2020-21) during post-GST period as compared to the same during the pre-GST period in Central taxes (from 1.37 to 1.39) (Row I & B). The average share of total GST collection (including GST on imports but excluding UT-GST components) is 6.16 per cent GDP (Row D). This shows a marginal improvement over the equivalent pre-GST revenue of 6.13 per cent of GDP (Row C). However, post-GST figures include GST compensation cess collection. If we exclude average annual share of GST compensation cess collection (i.e., 0.48% of GDP during 2018-23), it falls below the average share of pre-GST revenue in GDP. We also observe a marginal improvement in average annual tax buoyancy during post-GST period in total GST collection, i.e., from 1.04 (Row C) to 1.18 (Row D). During pre-GST period, the share of total fiscal resources to states from taxes subsumed in GST (including States' share in the Union taxes pertaining to GST) was 4.15 per cent of GDP with an average annual tax buoyancy of 1.10 (Row E). Post-GST average share of the equivalent revenue falls to 3.63 per cent of GDP with an average annual tax buoyancy of 0.90 (Row G). This does not include GST compensation that states received during post-GST period. With GST compensation post-GST average share becomes 4.37 per cent of GDP with an average annual tax

buoyancy of 0.77 (Row H). Post-GST with compensation from all sources tax buoyancy is lower than post-GST without compensation tax buoyancy. This is mainly because of states received back-to-back loans during 2020-22 which cease to exist in 2022-23 and it reduces terminal year's tax buoyancy. The share of Central taxes subsumed into GST (Net to Centre) used to contribute on average 1.98 per cent of GDP with an average annual tax buoyancy of 0.93 (Row J). Post-GST average share of GST revenue of the Union government (Net to Centre) falls to 1.5 per cent of GDP with an average annual tax buoyancy of 1.67 (Row K). Post-GST tax buoyancy in GST has improved for the Union, state as well as general governments. GST-to-GDP ratio of the Union as well as state governments not yet improved as compared to the average share of pre-GST equivalent revenue stream in GDP that respective governments used to enjoy prior to the introduction of GST.

Table 7: Revenue Performance of GST: Pre- vs. Post-GST Comparison

Description	Average Annual Share in GDP (%)		Average Annual Tax Buoyancy	
	Pre-GST (2012-13 to 2016-17)	Post-GST (2018-19 to 2022-23)	Pre-GST (2012-13 to 2016-17)	Post-GST (2019-20, & 2021-22 to 2022-23)
A. State taxes subsumed into GST (all states)	3.016	--	0.709	--
B. Central taxes subsumed into GST	3.114	--	1.366	--
C. Total Taxes subsumed into GST (A+B)	6.130	--	1.039	--
D. Total GST Collection (including GST on imports but excluding UT-GST Components) (Comparable to C)*	--	6.159	--	1.178
E. Total fiscal resources to States from taxes subsumed in GST (including States' share in the Union taxes pertaining to GST)	4.146	--	1.099	--
F. SGST (including IGST Settlement and IGST Share to States) (Comparable to A)	--	2.618	--	0.961
G. SGST (including IGST settlement & share)+ Devolution from CGST & Service Tax (Comparable to E)	--	3.626	--	0.903
H. SGST (including IGST settlement & share)+ Devolution from CGST & Service Tax+ GST Compensation + Back-to-Back loans	--	4.373	--	0.770
I. CGST (Gross) (Including IGST Settlement on CGST Account) (Comparable to B)	--	2.462	--	1.393
J. Central Taxes subsumed in GST (Net to Centre)	1.984	--	0.932	--
K. GST revenue of the Union Government (Net to Centre) (Comparable to J)	--	1.503	--	1.666

Note: *- it includes GST compensation cess collection. On average GST cess collection is 0.48 per cent of GDP during 2018-23.

Under GST, it is expected that harmonization of indirect tax structure (e.g., tax rates, tax base, tax legislations), concurrent taxation power of the Union and state governments on consumption of goods and services and joint monitoring of taxpayers

would result in better tax compliance, reduce leakages of revenue and better tax coordination between the Central and state tax administrations.

Tax collection depends on size of the tax base, tax rates, tax compliance and tax efficiency. Tax administration is as important as tax capacity to augment revenues of a state. For developing countries like India, the saying by Casanegra de Jantscher (1990) that "tax administration is tax policy" is the most appropriate. There are several methods to estimate GST (or VAT) efficiency or effectiveness of GST (or VAT) administration. The alternatives are C-efficiency ratio (or collection efficiency) measure (Keen 2013), Stochastic Frontier Approach (Mukherjee 2020a) and Tax Administration Measure of Effectiveness or TAME (Das-Gupta et al., 2016). These macro approaches/ measures are effective to pursue government to initiate reforms in tax administration. However, these broad measures may not help to identify specific areas of strengths and weaknesses in tax administration where major reforms could be initiated. There are alternative methods for in-depth assessment of tax administration and they provide effective tool to assess the performance of tax administration – e.g., TADAT (Tax Administration Diagnostic Assessment Tool),[6] RA-FIT (Revenue Administration Fiscal Information Tool).[7]

Based on information available with us, we estimate C-efficiency ratio, Effective Tax Rates (ETRs), Compliance Gap and Policy Gap of Indian GST in the following section. The findings are indicative and availability of recent data could help us to refine the estimates.

3. C-efficiency of Indian GST

C-efficiency (or Collection efficiency) is a measure of VAT revenue efficiency. C-efficiency (E^C) is a ratio of actual VAT revenue vis-à-vis potential VAT revenue if a standard VAT rate is applied on tax base (i.e., aggregate consumption). It can be derived by the following formula:

$$\frac{R}{Y} = t_s E^C \left(\frac{C}{Y}\right) \quad (1)$$

$$\Rightarrow E^C \equiv R/(t_s C)$$

Where,

R is the VAT (or GST) revenue

Y is the GDP

t_s is standard VAT rate (in percentage point)

C denotes Consumption (valued at VAT exclusive prices)

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[6] https://www.tadat.org/

[7] https://data.rafit.org/?sk=57536808-1e0c-476f-bc20-afaac069aae8

Multiple rates of Indian GST make it difficult to derive a standard GST rate. Instead of standard GST rate, we apply an Effective Tax Rate (ETR) as estimated by Mukherjee (2021) by taking tax liability as percentage of taxable value for Q2:2017-18 to Q4:2019-20. Since Mukherjee (2021) derives the tax liability and taxable value from data extracted from GSTR-1 database as maintained by the GST Network (GSTN), it excludes GST collection from imports (collection of IGST and GST compensation cess) and taxable value of imports. For ready reference we present the relevant paragraph from Mukherjee (2021) as follows:

> "The coverage of tax liability in GSTR-1 is partial, as it does not capture IGST as well as GST compensation cess collections from imports. Therefore, in the present GST information system it is difficult to compile tax rate-wise all taxable value and tax liabilities based on Goods and Services Tax Network (GSTN) database. Though ITC utilization against imports is available and it is captured through GSTR-3B, corresponding taxable value of imports is not available across GST returns. When available ITC against imports are adjusted against tax liabilities, taxable value of imports is not available in the GSTR-3B, it reduces tax liability and effective tax rate." Mukherjee (2021, Page No. 12)

Mukherjee (2021) derives tax liability and taxable value from all India GSTR-1 database for the period July 2017 to November 2018 and the same data for Delhi is used to estimate all India ETR for the period July 2017 to March 2020. We present the two sets of data of tax liability (as % of taxable value) in Table 8 and label them ETR-Actual (based on actual all India figures) and ETR-Estimated (based on estimated all India figures from Delhi). To bring parity with estimates of Mukherjee (2021), we consider only domestic portion of GST collection (this excludes IGST and GST cess collection from imports) and labelled it as 'GST-Dom.' in Table 7. We compile GST collection data from monthly press releases of the Department of Revenue. We exclude GDP from imports of goods and services from total GDP (nominal) in our analysis. In consumption we take both Private Final Consumption Expenditure (PFCE) and Government Final Consumption Expenditure (GFCE) at market prices.

We estimate C-efficiency using formula presented in equation 1 above (Table 8). We also decompose C-efficiency into Policy Gap and Compliance Gap.

Table 8: Estimation of C-efficiency based on Nominal GDP (INR 10 million)

Period	GST-Dom. (A)	ETR-Actual (B1)	ETR-Estimated (B2)**	GDP* (C)	GST-Dom./GDP* (D)	Cons./GDP* (E)#	C-efficiency1## [D/((B1/100)*E)]	C-efficiency2@ [D/((B2/100)*E)]
Q2:2017-18	141,482	13.29		3,279,691	0.043	0.878	0.37	
Q3:2017-18	196,388	12.68		3,369,164	0.058	0.910	0.51	
Q4:2017-18	202,220	12.68		3,593,405	0.056	0.859	0.52	
Q1:2018-19	220,568	12.87		3,512,247	0.063	0.907	0.54	
Q2:2018-19	205,801	12.49		3,516,826	0.059	0.932	0.50	
Q3:2018-19	215,763	12.18	12.75	3,684,798	0.059	0.923	0.52	0.50
Q4:2018-19	234,662		12.71	3,708,627	0.063	0.913		0.54
Q1:2019-20	241,066		12.13	3,825,080	0.063	0.906		0.57
Q2:2019-20	218,675		10.55	3,801,263	0.058	0.938		0.58
Q3:2019-20	235,874		10.06	4,064,178	0.058	0.924		0.62
Q4:2019-20	248,788		12.06	4,114,103	0.060	0.887		0.57

Notes: GST-Dom. Implies GST collection from Domestic Components (i.e., excluding IGST and GST Cess collections from imports). *-Excluding GDP from Imports. **- Taken from Mukherjee (2021). #-Cons. implies Combined Private and Government Final Consumption Expenditures. ##- estimated based on ETR-Actual. @-Estimated based on ETR-Estimated.
Source: Compiled and estimated from Monthly Press Releases of Department of Revenue, Government of India, EPWRF Indian Time Series Database, and ETR estimates are taken from Mukherjee (2021).

Please note that our quarterly GDP figures are in market prices and it includes taxes on products and excludes subsidies on products. GST being an indirect tax on goods and services, GDP at market prices may not be a right indicator of tax base. So, as an alternative we use nominal Gross Value Added (GVA at basic prices, 2011-12 series) and estimate C-efficiency in Table 8. We find that estimated C-efficiencies based on nominal GDP (excluding GDP from imports) and nominal GVA (at basic prices) are similar (Table 8 & 9).

Table 9: Estimation of C-efficiency based on Nominal GVA of Indian GST (INR 10 million)

| Period	GST-Dom. (A)	GVA (B)	ETR-Actual (C1)	ETR-Estimated (C2)	GST/GVA (D)	Cons./GVA (E)	C-efficiency 1# [D/((C1/100)*E)]	C-efficiency 2@ [D/((C2/100)*E)]
Q2:2017-18	141,482	3,773,800	13.29		0.037	0.763	0.37	
Q3:2017-18	196,388	3,991,569	12.68		0.049	0.768	0.51	
Q4:2017-18	202,220	4,032,776	12.68		0.050	0.765	0.52	
Q1:2018-19	220,568	4,174,230	12.87		0.053	0.763	0.54	
Q2:2018-19	205,801	4,210,939	12.49		0.049	0.778	0.50	
Q3:2018-19	215,763	4,389,538	12.18	12.75	0.049	0.775	0.52	0.50
Q4:2018-19	234,662	4,400,422		12.71	0.053	0.770		0.54
Q1:2019-20	241,066	4,547,089		12.13	0.053	0.762		0.57
Q2:2019-20	218,675	4,470,175		10.55	0.049	0.798		0.58
Q3:2019-20	235,874	4,658,768		10.06	0.051	0.806		0.62
Q4:2019-20	248,788	4,679,078		12.06	0.053	0.780		0.57

Notes: As in Table 8
Sources: as in Table 8

Figure 1 shows that estimated C-efficiency ratio of GST varies from 0.50 to 0.62 during Q3:2017-18 to Q4:2018-19 with an average C-efficiency of 0.54. A rising trend in C-efficiency is observed during Q4:2018-19 to Q3:2019-20 and it falls to 0.55 again in Q4:2019-20. It is to be highlighted that ideally consumption expenditures data needs to be at GST excluded prices. However, our consumption expenditures data is at market prices (includes indirect taxes). Given other factors of equation (1), higher value of consumption expenditures (or tax base) reduces estimated C-efficiency ratio. Given other factors of equation (2), higher consumption expenditure (or tax base) reduces estimated ETR.

Figure 1: Estimated C-efficiency Ratio of Indian GST
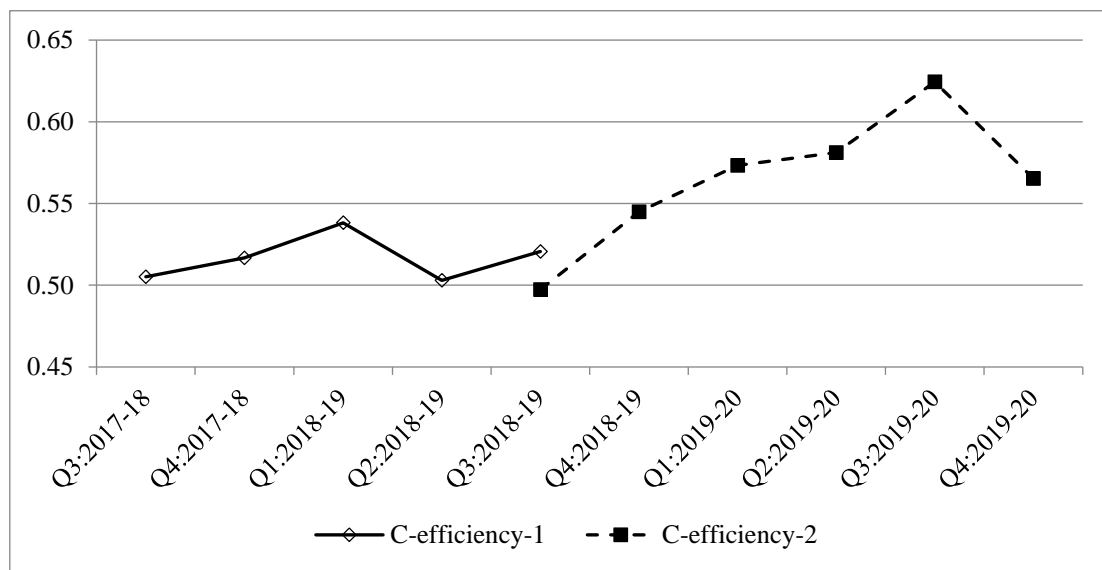

Source: Computed

According to Gupta and Jalles (2022), average C-efficiency ratio of developing Asia varies in between 0.50 to 0.60 during 2000 to 2018 (Figure 2). In absence of ETRs, we cannot estimate C-efficiency of Indian GST for the period beyond Q4:2019-20. Given the findings of Gupta and Jalles (2022), we assume that average C-efficiency ratio (i.e., 0.54), as observed during Q3:2017-18 to Q4:2019-20, prevails during Q1:2020-21 to Q3:2022-23. Therefore, by using average C-efficiency of 0.54, we estimate effective tax rate of GST upto Q3:2022-23 by using the following formula:

$$t_s = \frac{R}{Y} / \left[E^C \left(\frac{C}{Y} \right) \right] \qquad (2)$$

$$\Rightarrow \quad t_s \equiv R/(E^C * C)$$

We present estimated ETRs (in %) in Table 10. Like estimated C-efficiency, we do not find any difference in estimated ETR based on nominal GDP (excluding GDP from Imports) vis-à-vis nominal GVA (Table 10).

Figure 2: Value Added Tax (VAT) C-efficiency in selected regions, 2000–2018
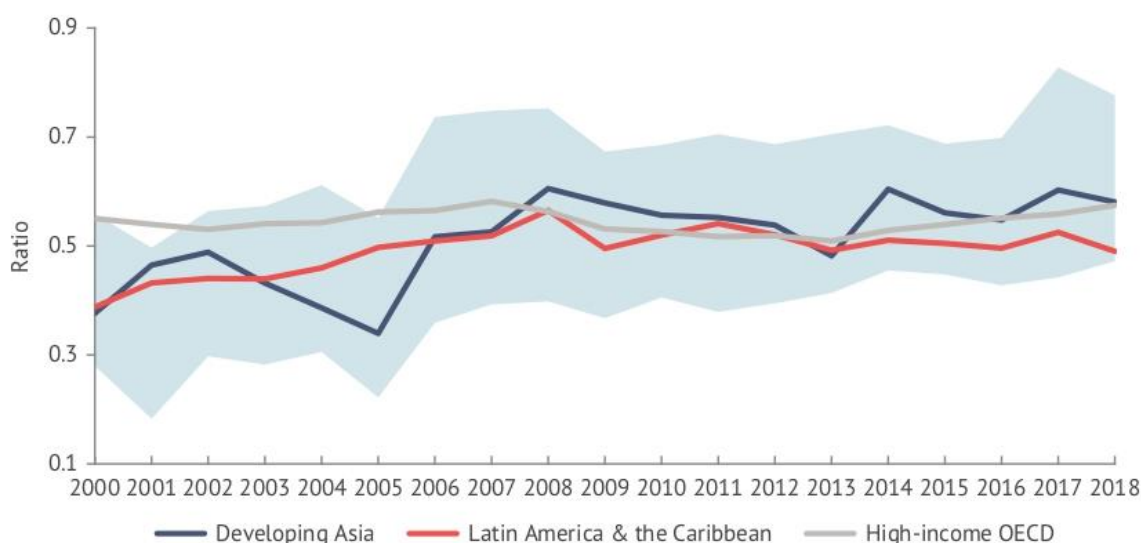
OECD = Organisation for Economic Co-operation and Development.
Notes: Excludes VAT c-efficiency observations greater than 1. Lines represent the median value for each region while the shaded area is the range between the 25th and 75th percentiles for Developing Asia.
Source: International Monetary Fund (accessed August 2021).

Source: Gupta and Jalles (2022, Figure 17, Page No. 15)

Table 10: Estimated Effective Tax Rate (ETR) of GST (Constant C-efficiency at 0.54)

| Quarter	GST-Dom./GDP* (A)	Cons./GDP* (B)	ETR1#	GST-Dom./GVA (C)	Cons./GVA (D)	ETR2@
Q1:2020-21	0.043	0.920	8.70	0.038	0.805	8.70
Q2:2020-21	0.053	0.865	11.37	0.048	0.777	11.37
Q3:2020-21	0.057	0.900	11.60	0.051	0.808	11.60
Q4:2020-21	0.060	0.917	11.95	0.052	0.804	11.95
Q1:2021-22	0.064	0.884	13.29	0.055	0.759	13.29
Q2:2021-22	0.061	0.921	12.16	0.051	0.778	12.16
Q3:2021-22	0.060	0.965	11.52	0.050	0.807	11.52
Q4:2021-22	0.060	0.937	11.87	0.051	0.785	11.87
Q1:2022-23	0.072	1.003	13.15	0.057	0.804	13.15
Q2:2022-23	0.068	0.999	12.46	0.053	0.789	12.46
Q3:2022-23	0.064	0.980	12.06	0.052	0.798	12.06

Note: # ETR1= [(Average C-efficiency x Cons./GDP)/(GST-Dom./GDP)]x100, here GDP is Total GDP – GDP from Imports.
@ ETR2= [(Average C-efficiency x Cons./GVA)/(GST-Dom./GVA)]x100
Source: Computed

We present the ETRs of Indian GST (both estimated and actual) for the period Q2:2017-18 to Q3:2022-23 in Figure 3. We observe a falling trend in ETR during Q1:2019-20 to Q1:2020-21, except during Q4:2019-20. After Q2:2020-21, ETR is varying between 11.5 to 13.3 per cent.

Figure 3: Effective Tax Rate of GST in India (%)
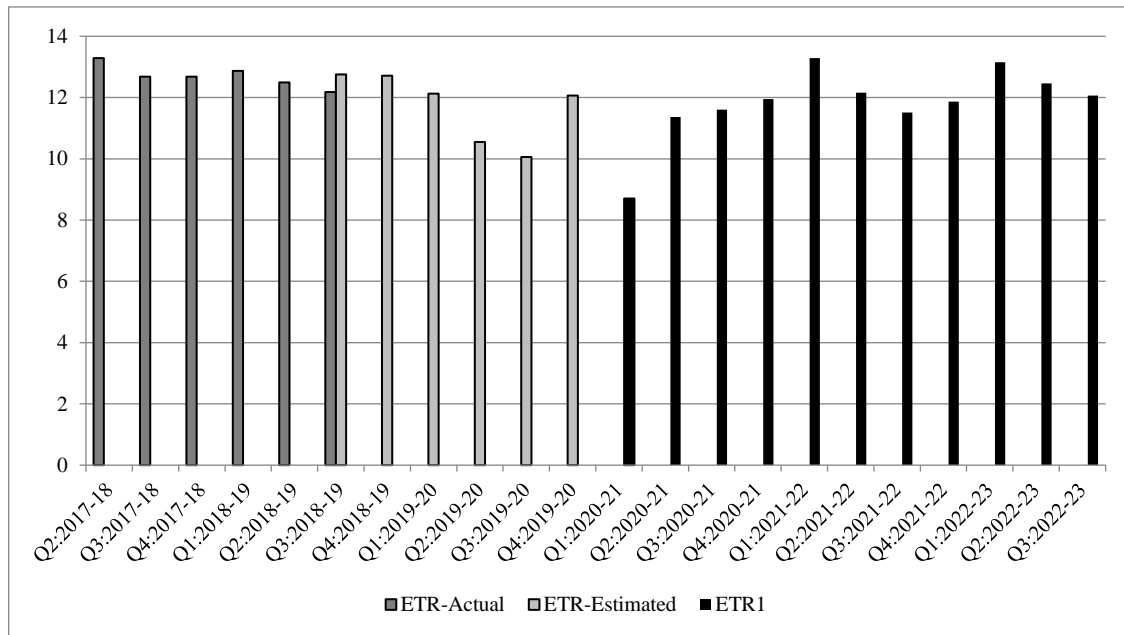
Source: Computed

ETR depends on tax base, i.e., distribution of taxable value (or turnover) across statutory tax rates (related to consumption pattern of the people) and distribution of tax liability across tax rates. Fall in average ETR during 2019-21 (Figure 4), may be result of various factors influencing tax collection. As for example, India experienced slowdown of economic growth during 2019-21. Fall in growth rate is expected to impact income of the people and therefore their consumption expenditures. Falling income may be compelling people to contain consumption to only basic necessities (e.g., foods, medicines) and therefore it has an impact on tax collection. In the present structure of GST, basic necessities are either exempted or face lower GST rates. Impacts of the COVID-19 pandemic on consumption expenditures, pattern, tax compliance and tax efficiency cannot be ignored and therefore resultant tax collection has suffered during 2020-21.

Figure 4: Annual Effective Tax Rate of GST (%)
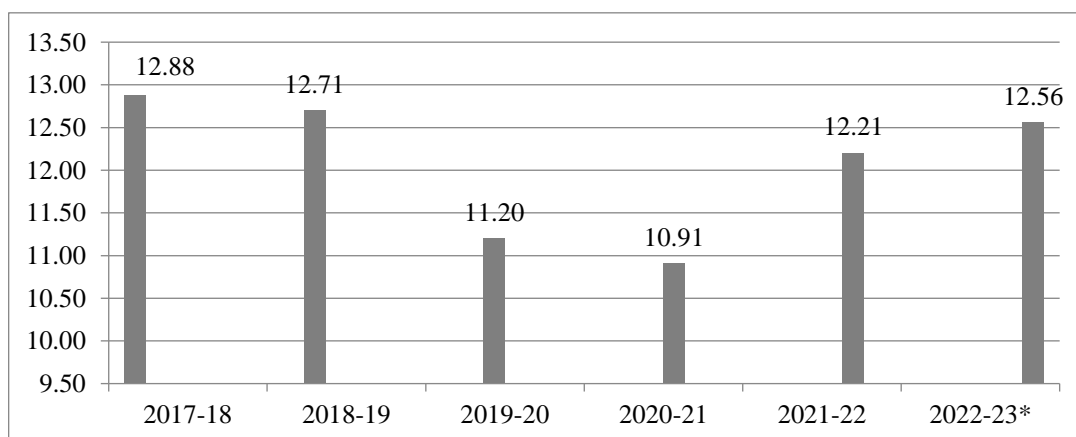
Note: *-upto Q3 of 2022-23.
Source: See Table 8 & 10

C-efficiency ratio can be further separated (decomposed) into *compliance gap* and *policy gap* (Keen 2013). The compliance gap measures the difference between potential GST (or VAT) revenue under current legislation with full compliance (PV^C) and actual GST (or VAT) collection (say, R) and it is expressed relative to PV^C. This is a measure of effectiveness of the revenue (tax) administration and tax compliance of taxpayers. The *compliance gap* is expressed as a proportion of the amount of GST/VAT that should be payable, that is as a ratio less than 1.0 and not a monetary amount. The *policy gap* measures the difference between hypothetical GST revenue if a single rate applies to all consumption (say PV^T) and PV^C. This is expressed relative to PV^T which measures the uncollected GST revenues due to differences in GST rates across commodities, exemptions, thresholds, abatements, etc. The policy gap could be further decomposed into *rate gap* and *exemption gap*. The *rate gap* reflects the impact of differentiation in statutory GST/VAT rates (e.g., lower rates for basic necessities) and the *exemption gap* reflects the impact of exemptions (Gendron and Bird 2021). The *compliance gap* could be further decomposed into the *collections gap* and the *assessment gap*. *Collections gap* measures the difference between what taxpayers have declared as being due, or have had assessed as being due, and the amount of GST/VAT collected. The *assessment gap* measures the difference between the total amounts declared as assessed or being due, and the total potential amount of VAT that should have been declared or assessed.

Following Ueda (2017), we estimate *Compliance Gap* and *Policy Gap* as follows:

$$E^C = \frac{R}{PV^T} = \left(\frac{R}{PV^C}\right)\left(\frac{PV^C}{PV^T}\right) = (1-\vartheta)(1-p) \qquad (3)$$

Where $\vartheta = \left(1 - \frac{R}{PV^C}\right)$ is the *Compliance Gap* and $p = \left(1 - \frac{PV^C}{PV^T}\right)$ is the *Policy Gap* of GST.

Given the data constraints, estimation of GST revenue under full compliance is a challenge. Filing tax return is the basic compliance requirement in any tax system as it transmits tax information from tax payers to tax administration. However, compliance in filing tax returns does not necessarily preclude that a tax payer is not involved in any tax evasion and therefore full compliance cannot be ensured even if full compliance in tax filing is reached.[8] In the GST system, monthly filing of GSTR-3B (a summary return requires for tax payment after adjustment of available ITC) and GSTR-1 (contains details of outward supplies and tax liability thereof, including inward supplies from unregistered / composition tax payers) is mandatory for all registered tax payers, unless special provision preclude them not to do so. Though for a considerable section of taxpayers (other than composition taxpayers) quarterly filing of GSTR-1 has been allowed, they have to pay due GST by filing GSTR-3B on monthly basis.[9] In absence of any other data to assess the level of tax compliance of GST, we consider monthly

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[8] Mukherjee (2020b) reports total GST evasion based on identified cases is INR. 0.86 Trillion during July 2017 to January 2020 which is 4.07 per cent of total GST collection during the period.

[9] GSTR-1 contains details of all outward supplies of goods and services of a taxpayer. This return also capture debit and credit notes issued. Any amendments to invoices issued earlier, even pertaining to previous tax periods, should be reported in the GSTR-1 return. GSTR-3B is a monthly summary self-declaration of all outward supplies, input tax credit claimed, tax liability ascertained and taxes paid thereof.

filing statistics of GSTR-3B from the GST Portal. Table 10 shows that there is gap between on-time (on or before the due date) and total (both on or before and after the due date) filing of GSTR-3B. Taxpayers have provision to file GSTR-3B return after the due date with payment of late fee and interest on the due tax amount thereof.

Table 11: Compliance in Filing GSTR-3B (in 10 million)

	No. of Tax Payers eligible to File (A)	No. Tax Payers filed by Due Date (B)	No. of Tax Payers filed after due date (C)	Total Returns Filed (D=B+C)	On-time Tax Filing (E=B/A*100)	Total Tax Filing (F=D/A*100)
Q2:2017-18	2.21	1.04	1.10	2.14	47.2	96.9
Q3:2017-18	2.35	1.46	0.77	2.23	62.3	95.1
Q4:2017-18	2.49	1.61	0.73	2.34	64.5	93.8
Q1:2018-19	2.73	1.49	0.95	2.45	54.8	89.9
Q2:2018-19	2.87	1.84	0.71	2.55	64.0	88.9
Q3:2018-19	2.95	1.84	0.78	2.62	62.3	88.9
Q4:2018-19	3.02	1.79	0.90	2.69	59.3	89.0
Q1:2019-20	3.09	1.93	0.78	2.71	62.4	87.7
Q2:2019-20	3.14	1.96	0.80	2.77	62.6	88.3
Q3:2019-20	3.13	2.07	0.76	2.83	66.0	90.3
Q4:2019-20	3.12	1.58	1.31	2.89	50.5	92.7
Q1:2020-21	3.12	0.67	2.19	2.86	21.5	91.9
Q2:2020-21	3.21	1.66	1.28	2.94	51.6	91.5
Q3:2020-21	3.30	2.33	0.70	3.03	70.6	91.8
Q4:2020-21	2.32	1.51	0.66	2.17	65.3	93.7
Q1:2021-22	2.47	0.95	1.40	2.35	38.4	95.0
Q2:2021-22	2.53	1.84	0.57	2.41	72.6	95.1
Q3:2021-22	2.58	1.94	0.51	2.45	75.4	95.0
Q4:2021-22	2.62	1.93	0.57	2.49	73.6	95.2
Q1:2022-23	2.67	2.06	0.47	2.53	77.2	94.7
Q2:2022-23	2.72	2.07	0.47	2.54	75.9	93.3
Q3:2022-23	2.77	2.18	0.33	2.51	78.4	90.4

Source: Compiled from GST Portal.

Figure 5 shows that post pandemic, compliance in on-time filing of GSTR-3B has improved as compared to the pre-pandemic average. Still on average 5 per cent of eligible taxpayers are not filing GSTR-3B.

Figure 5: Compliance of filing GSTR-3B (% of Taxpayers Eligible to File GSTR-3B)
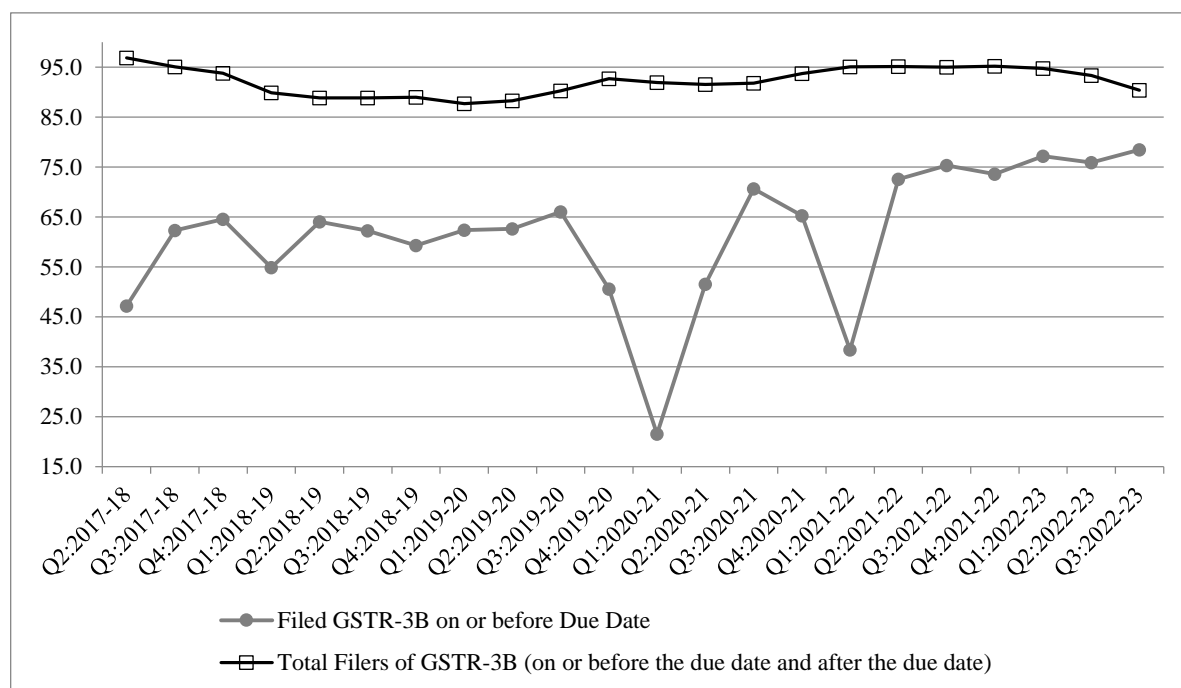
Source: Computed

We estimate the Potential GST collection with full compliance (PV^C) by the following formula:

$$PV^C = \frac{R}{Compliance\ in\ Filing\ GSTR-3B} * 100 \qquad (4)$$

where R is the GST collection from domestic components.

We estimate, PV^T by the following formula:

$$PV^T = \left(\frac{ETR}{100}\right)(PFCE + GFCE) \qquad (5)$$

Where, ETR is the Effective Tax Rate and we use estimated ETRs as presented in Table 10 above.

By using equation 4, we estimate potential GST collection if all eligible taxpayers file GSTR-3B. Here our assumption is that average tax collection per tax payer remains same between tax filers and non-filers. In other words, each additional tax payer will pay the same amount of average GST as those tax payers who are currently filing GSTR-3B.

As mentioned earlier, compliance in filing GSTR-3B cannot be the only indicator of GST compliance. Availability of data of identified cases of tax frauds (evasions) and amount involved thereof could help us to refine the estimate. To estimate, Effective Tax Rate (ETR) for the period Q1:2020-21 to Q3:2022-23, we have assumed C-efficiency ratio remains constant during the period. Therefore, availability of tax rate-wise taxable value (or turnover) and tax liability from GSTR-1 database could help us to estimate ETR and C-efficiency. We consider sum of Private Final Consumption Expenditure (PFCE) and Government Final Consumption Expenditure (GFCE) as total consumption (or tax base) of the economy. Possibility of over or under estimation in any of these

consumption baskets cannot be over ruled.[10] Equation 2 shows that at a given tax base (or consumption) and tax (GST) collection, if C-efficiency ratio improves, it will result in fall in effective tax rate. Similarly, at a given tax base and tax collection, if ETR increases it will result in fall in C-efficiency ratio.

Table 12 shows that relative share of compliance gap in C-efficiency is lower than policy gap for Indian GST (Figure 6). A broad base low rate GST is desirable in India and for that we need to restructure GST rate structure by reducing the number of GST rates and number of items under the current list of exemptions.

Table 12: Estimation of Compliance Gap and Policy Gap of Indian GST

Period	GST-Domestic (R) (Rs. Crore)	Compliance in Filing GSTR-3B (%) (F)	Potential GST Collection with Full Compliance (PV^C) [(R/F)*100] (Rs. Crore)	ETR (%)	PV^T (Rs. Crore)	C-efficiency (R/PV^T)	R/PV^C	PV^C/PV^T	Compliance GAP	Policy Gap
Q2:2017-18	141,482	96.87	146,058	13.29	382,831	0.370	0.969	0.382	0.031	0.618
Q3:2017-18	196,388	95.07	206,573	12.68	388,711	0.505	0.951	0.531	0.049	0.469
Q4:2017-18	202,220	93.81	215,557	12.68	391,364	0.517	0.938	0.551	0.062	0.449
Q1:2018-19	220,568	89.86	245,448	12.87	409,836	0.538	0.899	0.599	0.101	0.401
Q2:2018-19	205,801	88.86	231,610	12.49	409,163	0.503	0.889	0.566	0.111	0.434
Q3:2018-19	215,763	88.87	242,795	12.75	433,840	0.497	0.889	0.560	0.111	0.440
Q4:2018-19	234,662	89.00	263,657	12.71	430,592	0.545	0.890	0.612	0.110	0.388
Q1:2019-20	241,066	87.72	274,800	12.13	420,510	0.573	0.877	0.653	0.123	0.347
Q2:2019-20	218,675	88.26	247,759	10.55	376,254	0.581	0.883	0.658	0.117	0.342
Q3:2019-20	235,874	90.29	261,246	10.06	377,779	0.624	0.903	0.692	0.097	0.308
Q4:2019-20	248,788	92.72	268,311	12.06	440,147	0.565	0.927	0.610	0.073	0.390
Q1:2020-21	139,090	91.94	151,288	8.70	256,276	0.543	0.919	0.590	0.081	0.410
Q2:2020-21	205,138	91.53	224,129	11.37	377,971	0.543	0.915	0.593	0.085	0.407
Q3:2020-21	250,074	91.80	272,402	11.60	460,766	0.543	0.918	0.591	0.082	0.409
Q4:2020-21	271,535	93.72	289,717	11.95	500,308	0.543	0.937	0.579	0.063	0.421
Q1:2021-22	252,923	95.04	266,113	13.29	466,016	0.543	0.950	0.571	0.050	0.429
Q2:2021-22	258,999	95.14	272,234	12.16	477,211	0.543	0.951	0.570	0.049	0.430
Q3:2021-22	286,777	94.98	301,927	11.52	528,392	0.543	0.950	0.571	0.050	0.429
Q4:2021-22	303,229	95.20	318,531	11.87	558,705	0.543	0.952	0.570	0.048	0.430
Q1:2022-23	335,780	94.72	354,491	13.15	618,681	0.543	0.947	0.573	0.053	0.427
Q2:2022-23	312,721	93.35	335,006	12.46	576,195	0.543	0.933	0.581	0.067	0.419
Q3:2022-23	328,406	90.36	363,454	12.06	605,094	0.543	0.904	0.601	0.096	0.399

Source: Computed

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[10] Please see http://web.worldbank.org/archive/website00811/WEB/PDF/SECTIO-4.PDF (last accessed on 20 February 2023).

Figure 6: C-efficiency, Compliance Gap and Policy Gap of Indian GST
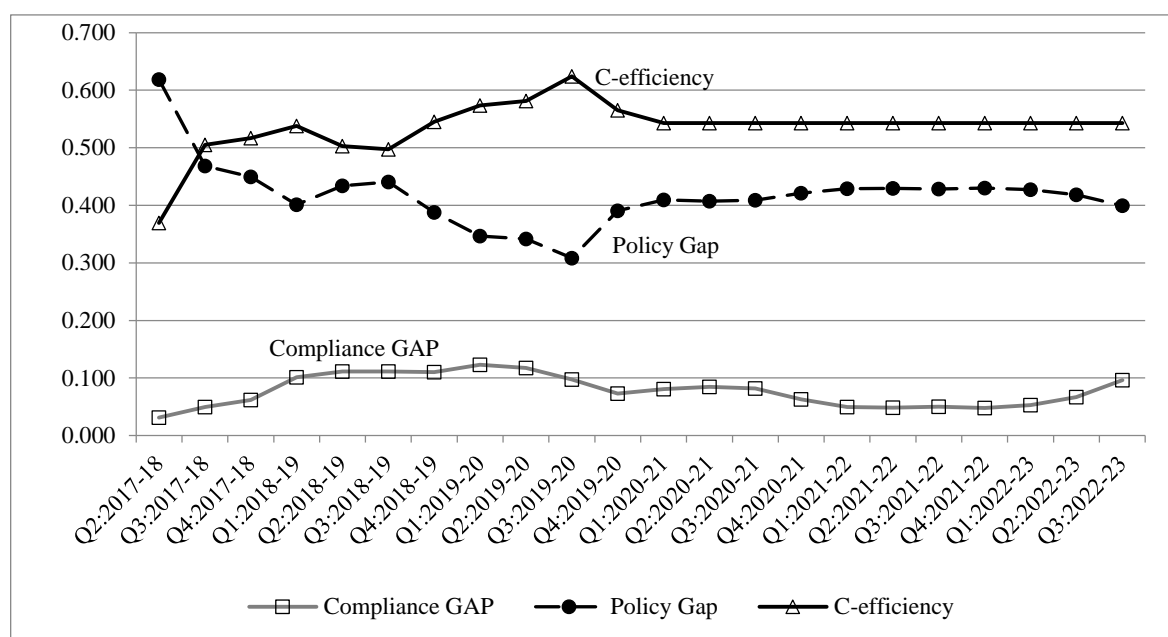
Source: Computed

Available evidence from EU and OECD countries also shows that compliance is relatively lower than policy gap, except in Greece (Table 13). It is to be noted that all series presented in Figure 9 are in ratio whereas Table 13 numbers are in percentage.

Table 13: Decomposing C-efficiency of Selected EU and OECD Countries in 2006

Country	C-efficiency (%)	Compliance Gap (%)	Policy Gap (%)
Austria	59	14	31
Belgium	52	11	42
Denmark	64	4	33
Finland	61	5	36
France	51	7	45
Germany	57	10	37
Greece	47	30	33
Ireland	66	2	33
Italy	43	22	45
Luxembourg	87	1	12
Netherlands	60	3	38
Portugal	53	4	45
Spain	57	2	29
Sweden	56	3	42
United Kingdom	48	17	42

Source: Keen (2013, Table 1, Page No. 20).

4. Conclusions

GST has subsumed many taxes from the Union and state tax bases and therefore identification of revenue streams of taxes subsumed into GST is important for the revenue performance assessment of the GST. Unlike revenue streams of state taxes subsumed into GST, corresponding revenue streams of the Union taxes are not readily available from a single source. Given the information available in the public domain and assessments of earlier studies, we estimate the revenue streams of subsumed Union taxes in GST for the period 2012-13 to 2016-17. Even after five years of GST, compiling reliable sources of data related to GST is a major challenge and it is hampering policy research on GST. Given the data constraints, this study is an attempt to assess the revenue performance of GST. Access to reliable information in future could help us to revise the estimates presented in this paper.

Like the world economy, Indian economy has also faced economic slowdown during 2020-21 due to the COVID-19 pandemic. The impact of economic slowdown on consumption expenditure was relatively weaker during Q4:2018-19 to Q4:2019-20 as compared to the pandemic period (i.e., Q1 & Q2 of 2020-21). Consumption being the tax base of GST, any volatility in consumption expenditure is expected to make GST collection vulnerable to shocks (or volatility), at least in the collection of domestic portion of GST. We have observed volatility in GST collection during the post-pandemic period and it is largely related to volatility in the consumption expenditures.

During pre-pandemic period (i.e., Q3:2017-18 to Q4:2019-20), the range of GST collection (as % of nominal GDP) was 5.8 to 6.4 per cent and during the post-pandemic (i.e., Q3:2020-21 to Q3:2022-23), it is 6 to 7 per cent. Therefore, we observe a marginal improvement in the GST collection after the pandemic. Similarly, during the pre-pandemic period GST collection (as % of consumption expenditures) used to vary between 8 to 9.2 per cent and the range is 8.2 to 9.6 per cent during the post-pandemic period. The improvement in GST collection during post-pandemic period is also the result of rising consumer prices of goods and services and increasing compliance in filing of GSTR returns.

By comparing comparable revenue streams of pre- and post-GST periods, in this paper we assess the revenue performance of GST in India for the period Q2:2017-18 to Q3:2022-23. Sustaining revenue streams of the Union and State governments (in terms of percentage share in nominal Gross Domestic Product or GDP) between the pre- and a post-GST period is important for sustainable Public Finance Management.

We summarize the main findings of the study as follows:

a) Pre-GST average share of revenue from state taxes subsumed into GST was 3.02 per cent of GDP, whereas average share of State GST (including IGST settlement and share) is 2.62 per cent of GDP.

b) There is an improvement in average annual tax buoyancy in State GST collection vis-a-vis tax buoyancy in subsumed state taxes from 0.71 to 0.96.

c)   We observe that average annual share of CGST collection (gross, including IGST settlement on CGST account) is 2.46 per cent of GDP, whereas the equivalent Central taxes used to contribute 3.11 per cent of GDP during the pre-GST period.

d)   There is a marginal improvement in average annual tax buoyancy (excluding 2020-21) during post-GST period from the pre-GST period in Central portion of GST (from 1.37 to 1.39).

e)   The average share of total GST collection (including GST on imports but excluding UT-GST components) is 6.16 per cent GDP. This shows marginal improvement over the equivalent average pre-GST revenue of 6.13 per cent of GDP. However, post-GST figures include GST compensation cess collection. If we exclude average annual share of GST compensation cess collection (i.e., 0.48% of GDP), it falls below the average share of pre-GST revenue.

f)   We find a marginal improvement in average annual tax buoyancy during post-GST period in total GST collection, i.e., from 1.04 to 1.18.

g)   During pre-GST period, the share of total fiscal resources to states from taxes subsumed in GST (including States' share in the Union taxes subsumed into GST) was 4.15 per cent of GDP with an average annual tax buoyancy of 1.10. Post-GST average share of the equivalent revenue falls to 3.63 per cent of GDP with an average annual tax buoyancy of 0.90. This does not include GST compensation that states received during post-GST period. With GST compensation (from all sources) post-GST average share becomes 4.37 per cent of GDP with an average annual tax buoyancy of 0.77.

h)   Post-GST with compensation tax buoyancy is lower than post-GST without compensation, because states received back-to-back loans during 2020-22 which cease to exist in 2022-23 and it reduces terminal year's tax buoyancy.

i)   The share of Central taxes subsumed into GST (Net to Centre) used to contribute on average 1.98 per cent of GDP with an average annual tax buoyancy of 0.93. Post-GST average share of GST revenue of the Union government (Net to Centre) falls to 1.5 per cent of GDP with an average annual tax buoyancy of 1.67.

j)   Post-GST tax buoyancy in GST has improved for the Union, state and general governments. GST-to-GDP ratio of the Union as well as state governments not yet improved as compared to the share of equivalent revenue stream in GDP that respective governments used to enjoy prior to the introduction of GST.

Based on available information, we estimate C-efficiency ratio (or collection efficiency), Effective Tax Rates, Compliance Gap and Policy Gap of GST for the period Q2:2017-18 to Q3:2022-23. We find that average C-efficiency is 0.54 (or 54%). The estimated C-efficiency is in line with estimates available for developing Asia for the period 2000 to 2018. Average ETR was 12.88 per cent in 2017-18, it went down gradually to 10.91 per cent in 2020-21 and thereafter it has gone up to 12.21 per cent in

2021-22 and 12.56 per cent in 2022-23 (upto Q3 of 2022-23). We find that the share of policy gap in C-efficiency is higher than the same of compliance gap. This is in line with available findings for EU and OECD countries. However, in the estimation of compliance gap we have not taken into account tax evasions, as information available on GST evasion in the public domain is sparse and there is no systematic reporting (publishing) of identified cases of GST evasion and amounts involved therein.

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Appendix A

The Union Taxes Subsumed in GST

Mukherjee (2021) presents revenue of the Union taxes that is subsumed into GST for 2016-17 and 2017-18 (upto 30 June 2017). Except for a few items, the Union Excise Duty is subsumed into GST. Three petroleum products (viz., petrol or gasoline, diesel, aviation turbine fuel), crude petroleum, natural gas (compressed), and tobacco and tobacco products attract UED in the GST regime. Being under the Central VAT (CenVAT) system, we consider only the portion of tax (UED) liability which is paid in cash.

In Customs duty, Countervailing Duty (CVD or Additional Duty of Customs, levied in lieu of CenVAT) and Special Additional Duty (SAD or Special CV Duty, levied in lieu of State VAT) are subsumed into GST. Basic Customs Duty (BCD, or customs tariff) continues in the GST regime. The entire service tax is subsumed into GST.

Table A1: Union Taxes Subsumed in GST (INR 10 Million)

Revenue Stream	2016-17			2017-18 (April-June)		
	Cash (PLA)	CenVAT Credit	Total	Cash (PLA)	CenVAT Credit	Total
A. Total Union Excise Duty* (on goods subsumed under GST)	**143,317**	318,975	462,292	**32,678**	93,485	126,163
B. Customs Duty** Paid (Non-POL) (a+b+c) @			204,080			57,242
a) Customs Duty (BCD)**			60,643			19,789
b) CVD			**104,224**			**28,270**
c) SAD			**39,213**			**9,183**
C. Service Tax***	**254,499**	102,266	356,765	**81,228**	40,272	121,500

Notes: *-Inclusive of cess/ surcharge. **-Inclusive of cess/ surcharge and other miscellaneous receipts.
@Detail break-up of share of Customs (POL) revenue which has been subsumed under GST is not maintained separately. ***-Inclusive of cess and other receipts
Source: Mukherjee (2021, Table A1, Pp. 29).

We present subhead- wise revenue streams of the Union taxes which are either partially or fully subsumed into GST in Table A2. We compile the information from Union Budget documents. In addition to information presented in Table A1, for the Union Excise Duty we observe that revenues of several subheads show dramatic fall from 2017-18 (Table A3). Subsummation of those subheads into GST is the obvious reason behind dramatic fall in revenue. Therefore, we consider those revenue sources in estimation of revenue of the UED which is subsumed into GST for the pre-GST period. Based on revenue figures presented in Table A1 for each tax and compilation of revenue streams of the Union taxes (Table A2), we estimate ratio between two for 2016-17 and apply the ratio on compiled revenue steam for pre-GST period to estimate pre-GST subsumed revenue into GST for the Union government.

Table A2: Union Taxes Subsumed in GST (INR 10 Million)

Tax Head	2012-13	2013-14	2014-15	2015-16	2016-17 (A)	2016-17 (B)	B as % of A
Customs (CVD, SAD & Cesses thereunder)*	100,865	105,472	116,019	128,906	143,437		
Service Tax	132,601	154,778	167,969	211,414	254,499		
Union Excise Duty (including Cesses)*	75,085	71,028	69,050	95,929	143,317		
Total	**308,551**	**331,278**	**353,038**	**436,249**	**541,253**		
Customs (a+b+c+d)	**110,915**	**115,980**	**127,579**	**141,749**	**157,728**	**143,437**	**90.94**
(a) Additional Duty of Customs (CVD)	82,242	86,203	93,245	106,249	111,983		
(b) Special CV Duty	24,701	25,629	29,298	30,033	39,944		
(c) Education Cess	2,624	2,704	3,432	3,687	3,922		
(d) Secondary and Higher Education Cess	1,348	1,443	1,603	1,779	1,880		
Service Tax	**132,601**	**154,778**	**167,969**	**211,414**	**254,499**	**254,499**	**100**
Union Excise Duty [sum of (i) to (v)]	**145,624**	**137,756**	**133,920**	**186,051**	**277,958**	**143,317**	**51.56**
(i) Basic and Special Excise Duties excluding Cess on Motor Spirit and High Speed Diesel Oil	112,400	102,963	115,792	163,635	231,107		
(ii) National Calamity Contingent Duty	3,255	3,365	2,484	4,050	6,426		
(iii) Surcharge on Pan Masala and Tobacco Products	1,059	979	1,091	1,562	3,348		
(iv) Cesses administered by Department of Revenue [sum of (a) to (h)]	27,343	28,735	12,996	14,966	35,052		
(a) Education Cess	*4,504*	*4,532*	*4,283*	*47*	*45*		
(b) Secondary & Higher Education Cess	*2,258*	*2,225*	*2,145*	*22*	*21*		
(c) Cess on Bidi			*150*	*146*	*136*		
(d) Cess on Sugar			*565*	*1,008*	*2,882*		
(e) Cess on Automobiles			*370*	*386*	*409*		
(f) Others	*17,528*	*18,506*	*89*	*393*	*1,524*		
(g) Clean Environment Cess (Erstwhile-Clean Energy Cess)	*3,053*	*3,472*	*5,393*	*12,676*	*26,117*		
(h) Infrastructure Cess				*288*	*3,918*		
(v) Cesses administered by Other Departments	1,567	1,714	1,557	1,838	2,025		

Notes:*-Estimated
Source: Compiled from Union Budget Documents

Table A3: Components of the Union Excise Duty those are subsumed into GST (INR 10 Million)

Tax Head/ Sub-head	2016-17	2017-18	2018-19	2019-20
Union Excise Duty [sum of (i) to (v)]	**277,958.09**	**134,794.95**	**71,206.63**	**63,786.37**
(i) Basic and Special Excise Duties excluding Cess on Motor Spirit and High Speed Diesel Oil	231,106.98	116,886.22	69,351.86	61,779.31
(ii) National Calamity Contingent Duty	6,426.20	2,938.44	1,797.80	1,935.00
(iii) Surcharge on Pan Masala and Tobacco Products	3,347.75	989.70	0.20	0.10
(iv) Cesses administered by Department of Revenue [Sum of (a) to (h)]	**35,051.77**	**13,356.84**	**2.65**	**54.78**
(a) Education Cess	45.41	12.89	3.59	16.58
(b) Secondary & Higher Education Cess	21.31	5.59	1.86	8.08
(c) Cess on Bidi	136.21	32.60	-0.03	0.02
(d) Cess on Sugar	2,881.61	793.40	13.40	3.50
(e) Cess on Automobiles	408.55	96.42	0.08	1.08
(f) Others	1,523.78	48.61	-27.49	0.02
(g) Clean Environment Cess (Erstwhile-Clean Energy Cess)	26,117.25	11,463.43	4.88	24.56
(h) Infrastructure Cess	3,917.65	903.90	6.36	0.94
(v) Cesses administered by Other Departments	**2,025.39**	**623.75**	**54.12**	**17.18**

Source: Compiled from the Union Budget Documents
Note: Post-GST Average excludes Tax Buoyancy of 2020-21

Appendix B

Table B1: Estimation of Total GST Collection without UT GST Components (INR 10 Million)

Description	2018-19	2019-20	2020-21	2021-22	2022-23	Average of 2018-21
(A) Total UT GST Collection	2,778.76	3,034.98	2,764.20	3,990.76		
(B) IGST Settlement on UTGST Account	1,522.22	1,738.60	1,841.47	2,461.68		
(C) Total UT-GST Collection (including IGST Settlement on UT-GST Account) (A+B)	4,300.98	4,773.59	4,605.67	6,452.44	7,159.24*	
(D) Total GST Collection (including GST on Imports)	1,177,368.00	1,222,122.00	1,136,797.00	1,487,311.00	1,795,554.55	
C as % of D	0.365	0.391	0.405	0.434		0.399
(E) Total GST Collection without UTGST Components (D-C)	1,173,067.02	1,217,348.41	1,132,191.33	1,480,858.56	1,788,395.31	

Note: *-Estimated by using average share of Total UT-GST Collection (including IGST Settlement on UT-GST Account) in Total GST Collection (including GST on Imports) during 2018-19 to 2021-22
Source: Union Finance Account (various years) and Monthly Press Releases of the Department of Revenue, Ministry of Finance, Government of India.

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