

The Differential Impact of GST on Corporate Liquidity and Profitability: A Cross-Sectoral Analysis of the Automobile versus Information Technology Sectors

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Abstract

The Goods and Services Tax (GST), implemented in India on July 1, 2017, replaced a fragmented indirect tax structure with a unified consumption tax. This paper examines whether the GST transition differentially affected corporate liquidity and profitability across two structurally distinct sectors: the physical, goods-intensive Automobile sector and the intangible, service-based Information Technology (IT) sector. Using standalone audited financials of 20 publicly listed companies (10 each from IT and Automobile) over FY2014-15 to FY2020-21, segmented into pre-GST (FY15-17), transitional (FY18), and post-GST (FY19-21) periods, the study applies paired-sample and independent-sample t-tests, with non-parametric robustness checks, to five financial ratios: Current Ratio, Net Profit Margin, Tax Burden Ratio, Return on Assets, and Finance Cost as a percentage of Revenue. The results show that GST's effect was modest rather than sweeping: most of the five sector-wise differentials do not reach conventional statistical significance ($p < 0.05$). Return on Assets shows the strongest divergence — IT's ROA held steady while Automobile's declined by nearly four percentage points ($p = 0.068$ parametric; $p = 0.045$ under a non-parametric robustness check) — while liquidity, margins, and tax burden moved within a range attributable to sampling variation at this sample size.

Keywords: Goods and Services Tax; Corporate Liquidity; Profitability; Automobile Sector; Information Technology Sector; Difference-in-Differences

1. Introduction

On July 1, 2017, India replaced a fragmented indirect tax structure — Central Excise Duty, Service Tax, State VAT, and the non-creditable Central Sales Tax (CST) — with the unified Goods and Services Tax (GST). Under the pre-GST regime, CST was levied without credit on interstate stock transfers, after which excise duty and VAT were layered on top, embedding tax-on-tax costs into physical supply chains. Automobile manufacturers had historically responded by building decentralised, tax-driven warehouse networks in nearly every operating state simply to avoid CST, inflating inventory holding periods and freight overheads. GST's unified Input Tax Credit (ITC) mechanism was designed to relax exactly this constraint by allowing credit to flow across state lines and across the goods-services divide. GST itself was structured as a dual tax (CGST levied by the Centre, SGST by the states, and IGST on interstate

supply), marketed under a "one nation, one tax" framing intended to dismantle exactly the interstate CST friction described above. The IT sector faced no comparable physical-logistics friction, but absorbed a headline rate increase from 15% (Service Tax) to 18% (GST) on software and consulting services.

Existing literature on India's GST has evaluated firm-level effects mainly for manufacturing pooled together [1], or for supply-chain formalisation broadly [2], without directly contrasting a physical-goods sector against a service sector on liquidity and profitability outcomes over the same panel window. This paper addresses that gap using a same-window, two-sector comparison restricted to publicly listed firms, for whom standalone audited financial statements are consistently available across the full seven-year window — a comparability requirement that unlisted and SME data, drawn from varied and often unaudited sources, would not reliably satisfy.

Objectives:

1. To empirically assess whether the GST transition produced a differential effect on working capital liquidity (Current Ratio) between the Automobile and IT sectors.
2. To empirically assess whether the GST transition produced a differential effect on profitability (Net Profit Margin, Return on Assets) between the two sectors, and to examine tax burden and finance-cost patterns as supplementary indicators.

Hypotheses:

H1: The GST transition produced a statistically significant differential change in the Current Ratio of the Automobile sector relative to the IT sector.

H2: The GST transition produced a statistically significant differential change in the profitability (Net Profit Margin, Return on Assets) of the Automobile sector relative to the IT sector.

2. Review of Literature

Theoretically, GST should be more beneficial to goods intensive sectors than to service sectors because of the removal of cascading taxation. Under the pre-2017 regime, CST was levied without credit on interstate transfers, and excise duty and state VAT were then layered on top, embedding unrecoverable tax-on-tax costs specifically into physical, multi-state supply chains [3]. Patnaik (2026) [2], using difference-in-differences evidence from over 12,000 Indian firms, finds that GST's self-enforcing input-tax-credit design increased documented input purchases and reduced indirect-tax incidence after 2017, concentrated among manufacturing firms with the highest pre-reform exposure to cascading and informal procurement. By extension, this pattern would be expected to favour a physical-goods sector such as Automobile more than a service sector such as IT, where cascading, multi-state procurement is inherently less prevalent.

On profitability, the empirical literature is mixed rather than uniformly favourable to goods sectors. Riyazahmed (2022) [1], analysing a panel of 30 NIFTY-listed manufacturing companies from 2014-2021, found no significant average difference in operating profit margins between the pre- and post-GST periods, although the interaction of firm size and working capital with the post-GST period was statistically significant — indicating that GST's profitability effect, where present, is firm-specific rather than sector-uniform. In a separate, larger study spanning nine NSE sectoral indices and 1,230 firm-year observations from 2013-2022, Riyazahmed (2024) [4] found Automobile sector Return on Assets falling from a mean of 13.74% pre-GST to 9.86% post-GST, while the IT sector's sectoral effect in panel regression was comparatively less negative — a cross-sectoral pattern this paper's own results independently reproduce (Section 4.2). In a separate study of listed Indian automobile companies before and after GST, Gaikwad

and Gandhi (2025) [5] found statistically significant improvement in Revenue and Total Assets, but no significant change in Current Ratio, Profit Before Tax, or Profit After Tax, a pattern of selective rather than sweeping impact consistent with the results reported in Section 4 below.

In particular, in terms of working capital, Yameen, Farhan and Tabash (2019) [6], examining Indian pharmaceutical firms, confirm that the current and quick ratios have a significant positive relationship with Return on Assets, corroborating the treatment of Current Ratio and ROA in this paper as related indicators of financial health rather than unrelated measures.

For the IT sector, the services rate increase from 15% to 18% under GST is well documented in regulatory and industry commentary, alongside offsetting factors — availability of ITC on inputs, and zero-rating of software exports — that could cushion any margin impact. No study identified in this review directly contrasts Automobile and IT sector liquidity and profitability outcomes over the same panel window, despite the two sectors sitting at opposite ends of the asset-intensity spectrum that GST's design was intended to address.

Research Gap: Previous studies on GST at firm level have followed either pooled sector approach [1] or isolated single sector approach [5]. A direct, same-window comparison of a goods-intensive and a service-intensive sector's liquidity and profitability response has not been reported, and is the contribution of this paper.

3. Research Methodology

3.1 Research Design

This study uses a longitudinal, two-group comparative design across three regulatory phases: Pre-GST (FY2014-15, FY2015-16, FY2016-17), GST Transition (FY2017-18), and Post-GST Stabilisation (FY2018-19, FY2019-20, FY2020-21).

3.2 Population and Sample

The sample comprises 20 publicly listed Indian companies: 10 from the Information Technology sector (Tata Consultancy Services, Infosys, Wipro, HCL Technologies, Tech Mahindra, LTIMindtree, Mphasis, Oracle Financial Services, Persistent Systems, Coforge) and 10 from the Automobile sector (Maruti Suzuki, Tata Motors, Mahindra & Mahindra, Hero MotoCorp, Bajaj Auto, Eicher Motors, Ashok Leyland, TVS Motor, Escorts Kubota, Force Motors). All are NSE/BSE-listed entities with standalone audited financials available for the full seven-year window, which was the basis for their selection: audited, standardised annual-report data allows the same five ratios to be computed identically across all 20 firms, which a mixed listed/unlisted sample compiled from heterogeneous sources would not guarantee. Unlisted firms were outside the scope of the data available for this study and are not part of the sample.

3.3 Data Collection

Data are drawn from standalone audited financial statements (annual reports) for FY2014-15 through FY2020-21, compiled into a structured company-year panel. All figures are in Rs. Crores.

3.4 Variables of the Study

- Current Ratio = Current Assets / Current Liabilities
- Net Profit Margin (%) = Net Profit After Tax / Revenue $\times$ 100
- Tax Burden Ratio (%) = Tax Expense / Profit Before Tax. This is an effective corporate income-tax incidence measure, included for completeness. Because GST is a transaction-based indirect tax rather than an income tax, it does not directly determine this ratio; any shift here more likely reflects broader

corporate-tax dynamics (e.g., the September 2019 corporate tax rate cuts, MAT credit utilisation) than the GST reform itself.

- Return on Assets (%) = Net Profit After Tax / Total Assets × 100
- Finance Cost as % of Revenue = Finance Costs / Revenue × 100

3.5 Data Analysis Technique

With 10 firms per sector, the study uses paired and independent t-tests rather than a firm-level panel regression. First, a paired-sample t-test compares each firm's own Pre-GST average (FY15-17) against its Post-GST average (FY19-21) within each sector, testing whether that sector's own change is statistically distinguishable from zero. Second, for each firm a change score, delta (Post-GST average minus Pre-GST average), is computed, and an independent-samples Welch's t-test compares the IT sector's mean delta against the Automobile sector's mean delta. This operationalises the "differential impact" as a two-group analogue of a difference-in-differences estimate, without requiring the firm-fixed-effects panel regression and multi-test diagnostic battery (Hausman, Breusch-Pagan, VIF) that a longer-format study would report — a scope the 3,000-word length of this paper does not accommodate.

3.6 Statistical Tools

Descriptive statistics, paired-sample t-tests, and independent-samples (Welch) t-tests were computed in Python (pandas, SciPy). As a robustness check given the small sample (n=10 per sector), each paired test was repeated using the non-parametric Wilcoxon signed-rank test, and each differential test using the Mann-Whitney U test; results are reported alongside the parametric tests in Table 2.

4. Results and Discussion

Table 1 summarises the sector-wise pre-GST and post-GST averages, the change (Δ) for each sector, and the p-value of the between-sector (differential) t-test.

Table 1: Pre- vs Post-GST Sector Averages and Differential Test Results

Metric	IT: Pre M(SD) to Post M(SD)	Automobile: Pre M(SD) to Post M(SD)	Diff. t (df)	Diff. p
Current Ratio	3.31 (0.99) → 3.66 (1.88)	1.19 (0.51) → 1.45 (0.76)	0.12 (10.88)	0.908
Net Profit Margin (%)	21.24 (7.81) → 21.94 (8.22)	7.41 (7.44) → 6.65 (7.77)	0.76 (14.74)	0.462
Tax Burden Ratio (%)	22.68 (5.35) → 22.42 (3.50)	21.22 (11.47) → 24.17 (11.03)	-0.87 (10.98)	0.404
Return on Assets (%)	18.75 (6.77) → 20.01 (5.89)	12.64 (11.95) → 8.73 (7.68)	1.95 (16.95)	0.068
Finance Cost (% of Rev)	0.23 (0.31) → 0.39 (0.31)	0.81 (1.22) → 0.82 (1.41)	0.82 (12.24)	0.429

Figure 1: Sector-wise Trends in Key Financial Ratios, FY2015-FY2021 (dashed line = FY2017-18 GST transition year)

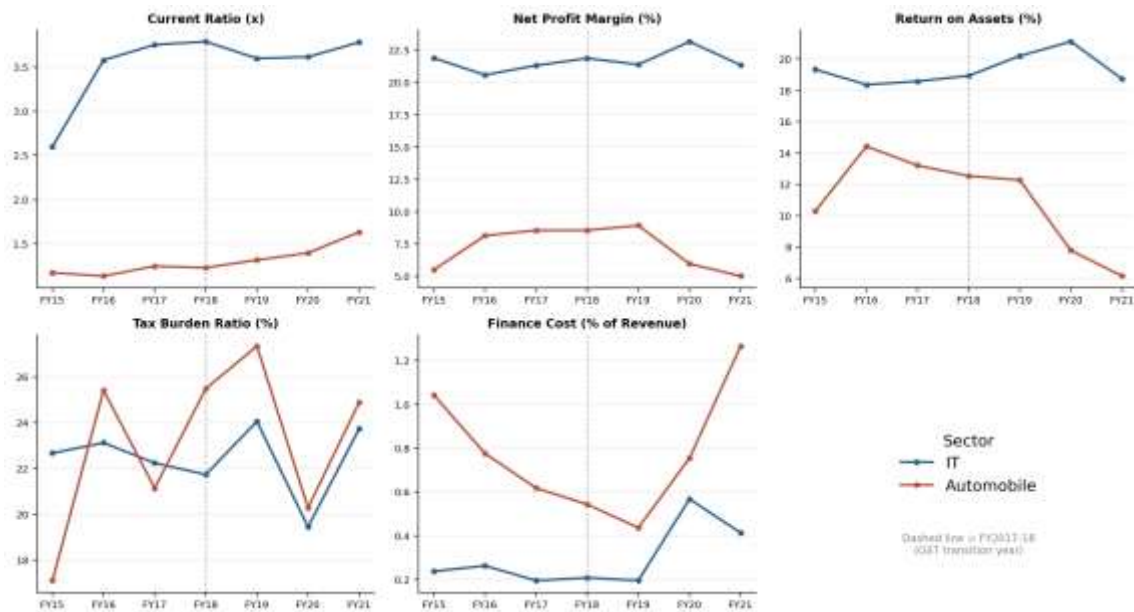


Table 2: Full Test Statistics and Non-Parametric Robustness Checks

Metric	IT paired t (df=9)	Auto paired t (df=9)	Wilcoxon p (IT)	Wilcoxon p (Auto)	Mann-Whitney p (Diff.)
Current Ratio	0.49	1.12	0.770	0.557	0.345
Net Profit Margin (%)	0.42	-0.76	0.770	0.160	0.427
Tax Burden Ratio (%)	-0.22	0.84	1.000	0.770	0.910
Return on Assets (%)	0.78	-1.87	1.000	0.084	0.045*
Finance Cost (% of Rev)	2.16	0.04	0.027*	0.770	0.427

* significant at $p < 0.05$ (discussed in Sections 4.2 and 4.4).

4.1 Working Capital and Liquidity (H1)

Both sectors' Current Ratios rose after GST — IT from 3.31 to 3.66, Automobile from 1.19 to 1.45 — but neither sector's own change reaches significance individually (paired $p = 0.636$ for IT, $p = 0.290$ for Automobile; full statistics in Table 2), and the between-sector differential is essentially zero ($t = 0.12$, $df = 10.88$, $p = 0.908$). H1 is not supported: at this sample size, there is no statistical evidence that GST improved Automobile sector liquidity more than IT sector liquidity, which is directly consistent with Gaikwad and Gandhi (2025) [5], who likewise found no significant Current Ratio shift for automobile firms specifically. The direction of the IT change (+0.35) is, if anything, numerically larger than

Automobile's (+0.26); IT firms already carry substantially higher liquidity buffers (current ratios above 3, versus close to 1 for Automobile, reflecting the latter's heavier reliance on inventory and payables), so similar-looking absolute changes do not indicate that Automobile "caught up" to IT. This structural gap reflects the two sectors' underlying business models — Automobile manufacturing ties up capital in raw materials, work-in-progress, and dealer receivables, while IT services carry minimal inventory and often hold surplus cash — rather than any GST-specific effect. In relative rather than absolute terms, Automobile's Current Ratio expanded by 21.8% (1.19→1.45) against IT's 10.6% (3.31→3.66) — roughly twice the proportional growth. This is a descriptive contrast, not separately significance-tested, but is more consistent with a working-capital-easing narrative for the goods-intensive sector than the absolute-point comparison alone suggests.

4.2 Profitability (H2)

Net Profit Margin moved in opposite directions for the two sectors (IT +0.71 points, paired $p=0.682$; Automobile −0.77 points, paired $p=0.464$), and the differential is not significant either ($t=0.76$, $df=14.74$, $p=0.462$). Return on Assets shows the clearest divergence: IT's ROA improved slightly (+1.26 points, paired $p=0.458$) while Automobile's fell by nearly four points (−3.91, paired $p=0.095$), and the differential is significant at the 10% level under Welch's t -test ($t=1.95$, $df=16.95$, $p=0.068$). This is the one result where the non-parametric check (Table 2) moves the conclusion: Mann-Whitney U on the two sectors' ROA deltas returns $p=0.045$, crossing the 5% threshold the parametric test narrowly misses. Given the small sample, the rank-based result arguably deserves equal weight, reinforcing rather than undercutting this paper's central finding. This is corroborated by an independent larger panel study. In another study, Riyazahmed (2024) [4] found that Automobile ROA fell from 13.74% to 9.86% (a drop of 3.88 percentage points) across nine NSE sectors. This is very close to the 3.91 percentage point decline observed here, but with a different sample and methodology. This convergence suggests the decline is real rather than sample-specific, running counter to the expectation that GST would lift Automobile profitability relative to IT. It more plausibly reflects the COVID-19 demand shock (nationwide vehicle registrations fell nearly 30%) [7], compounded by the capex shock of the mandatory BS-VI emission-norm transition (effective April 2020; ₹80,000–100,000 crore industry-wide), which inflated the asset base just as sales collapsed — mechanically depressing ROA independent of GST.

4.3 Tax Burden Ratio

Automobile's effective income-tax incidence rose more than IT's (Automobile +2.95 points, paired $p=0.423$; IT −0.26 points, paired $p=0.828$; differential $t=-0.87$, $df=10.98$, $p=0.404$), but because this ratio reflects corporate income tax rather than GST (a transaction tax), the movement should not be read as a GST effect; it more plausibly reflects the differential impact of India's September 2019 corporate tax rate cuts and MAT credit utilisation across the two sectors, both of which fall outside this paper's scope.

4.4 Finance Cost as % of Revenue

IT's finance-cost ratio nearly doubled in relative terms (+0.16 points, paired $p=0.059$), though it remains under 0.4% of revenue in absolute terms and so is immaterial in scale. This within-sector rise is significant under the non-parametric Wilcoxon test ($p=0.027$, Table 2) even though the paired t -test narrowly misses conventional significance, reinforcing that the increase, while small, is unlikely to be noise. Company-level data show this rise concentrated from FY2019-20 onward across several IT firms with previously zero finance cost (e.g., Infosys, Oracle Financial Services), coinciding with the effective date of Ind AS 116 (lease accounting), notified by India's Ministry of Corporate Affairs for accounting periods beginning on or after April 1, 2019 [8], which requires lease liabilities to be capitalised and their implicit interest

recognised as finance cost. This is more plausibly an accounting-standard effect than a GST-driven financing response, and is reported here as a caveat rather than a substantive finding.

4.5 The FY2017-18 Transition Year

Descriptively, IT's Current Ratio and Net Profit Margin continued their pre-GST trend through the transition year without a visible dip; Automobile's Current Ratio dipped marginally in FY2018 (1.23) relative to FY2017 (1.25), showing no sharp transitional shock in this five-ratio, ten-firm-per-sector sample — a milder picture than the severe, economy-wide transition friction often described in qualitative GST commentary.

5. Conclusion

5.1 Synthesis

Contrary to the expectation that GST would act as a strong, uniform catalyst favouring goods-intensive sectors over service sectors, this study finds that its measurable effect on corporate liquidity and profitability, at least among large publicly listed firms, was modest. Most of the five financial ratios examined do not show a statistically significant differential response between the Automobile and IT sectors over FY2014-15 to FY2020-21. The clearest divergence — significant under a non-parametric robustness check ($p=0.045$) though only marginal under the parametric test ($p=0.068$) — is in Return on Assets, where Automobile's asset returns weakened relative to IT's — a pattern more plausibly linked to the COVID-19 demand shock and the concurrent BS-VI capex transition in FY2020-21 than to the tax reform itself.

5.2 Academic Contribution

This paper contributes a direct, same-window comparison of a goods-intensive and a service-intensive sector's financial response to GST, an angle not covered by studies that pool sectors together [1] or examine one sector alone [5]. It also extends the pharmaceutical-sector liquidity-profitability linkage documented by Yameen, Farhan and Tabash (2019) [6] to a cross-sectoral setting, showing that the relationship between a sector's baseline liquidity structure and its measured profitability response need not hold uniformly once a tax-regime shock is introduced. Methodologically, it also illustrates that a modest-sample comparative design (paired and independent t-tests) can produce a defensible, honest null-to-marginal result, which is itself informative: it cautions against attributing every post-2017 shift in Indian corporate financials to the GST reform without first testing for statistical significance.

5.3 Policy Implications

The absence of a strong, significant Automobile liquidity gain in this sample suggests policymakers should be cautious about assuming GST's working-capital benefits have fully materialised for large listed manufacturers. If anything, the more severe transitional friction historically documented for GST falls on unlisted, tier-2 and tier-3 suppliers outside this sample — a segment this study could not examine due to data availability, and which remains a priority for targeted compliance simplification.

5.4 Managerial Implications

For Automobile sector finance teams, the data offer no strong evidence that GST alone has structurally freed up working capital at the scale sometimes assumed; treasury planning should continue to rely on firm-specific cash-flow forecasting rather than a general "GST liquidity dividend." For IT sector finance teams, the small but rising finance-cost ratio is attributable to lease-accounting changes (Ind AS 116) rather than new borrowing behaviour, and should not be mistaken for GST-related cost pressure.

5.5 Limitations and Future Research

This study is limited to 10 listed firms per sector; unlisted and SME entities, where GST's compliance and liquidity effects are most frequently reported in the qualitative literature, are outside its scope due to data availability, and their inclusion remains an important extension. The FY2020-21 observation is confounded by COVID-19 demand and supply shocks unrelated to GST. The Tax Burden Ratio, an income-tax measure, is only indirectly connected to GST and should not be over-interpreted as a GST transmission channel. With only 10 firms per sector, statistical power is limited, and a larger panel or firm-level regression controlling for size and leverage could detect smaller effects than this design can. Future research extending the panel through FY2024-25, beyond the pandemic distortion, using a larger, size-stratified sample that includes unlisted firms, would offer a more complete test of GST's differential sectoral impact. Two firm-level data notes are also flagged for transparency: Force Motors' FY2020-21 current-liabilities figure required a source correction mid-study, and Eicher Motors' reported FY2015 figures reflect a balance-sheet date of December 2014, with FY2016 accordingly spanning a 15-month stub period to March 2016 as the company transitioned to a March fiscal year-end; both firms' figures are retained in the reported averages as disclosed, rather than excluded.

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