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ABSTRACT

24 Over the past decades, the topic of sustainable development has become increasingly important, both in terms of economic policies and human development of a country. Around the world, countries are focusing more on long term sustainability goals to achieve a steady and continuous development of their people and communities. To concur problems which has occurred due to selfish needs and comfort of human beings. United Nations along with world leaders have proposed Sustainable Developmental Goals famously known as SGDs. There are 17 SGDs in total which UN is currently focusing on. As major role in a country development and advancement was driven by companies who were working in core sectors like coal, oil, textile, minerals, liquors, weapon and technology. These sectors were also known to have quite negative impact on environment. So, to create a positive image on 7 society as well as give back to community Frederick Goff, suggested idea of social contract to between business and society. Similar, to that concept later idea of Corporate Social Responsibilities (CSR) initiatives. So, that corporate companies around the world have a positive relationship with society and contribute towards its development as well instead of just being limited to business transactions.

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CHAPTER 1

INTRODUCTION

Sustainability has emerged as a dominant theme in public discourse over the past decade, particularly as younger generations increasingly pressure governments and corporations to adopt meaningful change. However, discussions around corporate responsibility are far from new—their roots trace back over 150 years. Achieving true sustainability requires

collaboration among three key actors: governments, civil society, and private businesses. These stakeholders must work together across local, national, and global levels, guided by regulatory frameworks that enable targeted sustainability strategies. A significant milestone in this effort came in 2015, when the United Nations introduced the Sustainable Development Goals (SDGs). This framework provided a unified roadmap for both public and private sectors to track and accelerate progress toward a more sustainable future.

1.1.**CSR definition:**

On September 2015, the United Nations (UN) proposed certain goals to work towards more sustainable global development by 2030. Sustainable development is defined as "*development which is designed to meet the needs of the present generation without compromising the needs of future generations*" [*Sustain et. al. 2021*]

Proponents, such as Porter and Kramer (2011), argue that strategic CSR aligns profitability with societal good, creating "shared value" that benefits both corporations and communities. Similarly, scholars like Sachs (2012) view the SDGs as a transformative framework, offering measurable targets to address systemic inequalities and environmental degradation. Additionally, according to *Nuryaman (2013)*, "CSR could be seen as a company's commitment into integrating social and environmental needs into business operations in a sustainable way to balance the interests and welfare of stakeholders".

However, critics contend that these initiatives often prioritize symbolism over substance. Banerjee (2008), for instance, critiques CSR as a neoliberal tool that legitimizes corporate power while deflecting scrutiny from unsustainable core operations. Others, including Bebbington and Unerman (2018), caution that the SDGs' voluntary nature allows governments and firms to "cherry-pick" goals without systemic accountability. This tension underscores a fundamental debate: are CSR and the SDGs driving meaningful change, or merely repackaging business-as-usual in ethical rhetoric?

1.2. **Indian companies on CSR initiative:**

Integration of social and environmental concerns in firms' business operations have led to variety of impacts. To explores the effectiveness of the New Companies, Act 2013 amendment regarding CSR initiatives and its impact.

In 2013, the new Companies Act 2013 made it mandatory for every company having net worth more than 500 crores or more, a turnover of Rs. 1,000 crores or more or net profit of Rs.5 crores or more during any financial year should contribute 2% of their average net profit during the three immediately preceding financial years towards CSR, and these companies are also suggested to form separate CSR committee and to disclose CSR activities in the official annual report.

Many leading Indian corporations, particularly in sectors like IT, pharmaceuticals, and renewable energy, have integrated CSR into their core business strategies. For instance, Tata Group's CSR initiatives—spanning education, healthcare, and rural development—are often

framed as an extension of its founder's philanthropic vision rather than mere compliance (Jain & Winner, 2016). Similarly, Infosys Foundation has leveraged CSR to enhance its brand reputation while addressing digital literacy and healthcare gaps. These companies argue that well-structured CSR fosters sustainable growth, stakeholder trust, and even employee retention.

Conversely, smaller and mid-sized firms frequently treat CSR as a statutory burden rather than a value-driven commitment. A 2020 study by the Indian Institute of Corporate Affairs (IICA) found that nearly 30% of eligible companies merely meet the minimum 2% profit spending requirement without long-term planning (IICA Report, 2020). Critics, including some industry leaders, contend that mandatory CSR discourages genuine innovation by reducing social responsibility to a financial transaction.

Despite progress, skepticism persists. Some executives privately argue that CSR funds could be better utilized if companies had more flexibility in implementation (Economic Times, 2021). Others highlight inefficiencies in fund allocation, with rural development and education receiving disproportionate attention compared to environmental sustainability.

In short Indian companies' views on CSR remain polarized—between those seeing it as a transformative tool and those dismissing it as a regulatory formality. However, the increasing emphasis on measurable impact (e.g., through SDG-aligned reporting) suggests a gradual maturation of CSR from obligation to opportunity.

8 1.3.**How have companies adapted CSR initiatives?**

The Corporate Social Responsibility (CSR) and the Sustainable Development Goals (SDGs) have become defining features of 21st-century business, but their adoption varies dramatically across industries and borders. While some companies treat them as transformative frameworks, others see them as little more than compliance exercises. What emerges is a complex, often contradictory global landscape—one where corporate idealism clashes with economic realities.

In 2024, a numerous corporate policies are linked to the Sustainable Development Goals (SDGs). According to recent data, around **72%** of corporations globally have indicated various forms of engagement with the SDGs. These works include integrating SDGs-related targets into their corporate strategies, sustainability reporting, and aligning their business practices with the company goals.

1.3.1 Developed Nation: Where CSR-SDG meets shareholder demands

In Europe and North America, CSR has gradually shifted from charitable giving to a strategic business function. Take Unilever, for instance. Its *Sustainable Living Plan* doesn't just pay lip service to environmental goals—it ties executive bonuses to reductions in plastic waste and
13 carbon emissions (SDGs 12 and 13). Similarly, Microsoft's pledge to go *carbon negative* by 2030 reflects a growing recognition that sustainability drives investor confidence.

Yet for every Unilever, there's a company accused of *greenwashing*. Critics argue that many
33 Western corporations use CSR as a PR tool rather than a catalyst for real change. The rise of

ESG (Environmental, Social, and Governance) investing has forced firms to report on sustainability, but the quality of those disclosures varies widely. As one industry insider quipped, *"Some companies spend more on their sustainability reports than on actual sustainability."*

1.3.2. Developing countries: Between Regulation and Reality

In countries like India and Brazil, CSR isn't just encouraged—it's legally mandated. India's *Companies Act* requires large firms to spend 2% of profits on social initiatives, leading to mixed results. While giants like Tata Group and Mahindra have built hospitals and schools (aligning with SDGs 3 and 4), smaller firms often treat CSR as a tax-like obligation rather than a moral commitment.

China presents a different dynamic. There, CSR is often intertwined with state policy. Alibaba's rural e-commerce initiatives, for example, dovetail neatly with Beijing's poverty reduction targets (SDG 1). But without independent oversight, it's hard to gauge whether these efforts create lasting impact or merely serve political ends.

Meanwhile, in Africa, companies like Kenya's Safaricom have pioneered *homegrown* CSR—using mobile money to boost financial inclusion (SDG 8). Yet weak regulation means progress is uneven. As one Nairobi-based executive put it: *"We're expected to solve problems that governments can't—but without their support."*

6 Evaluation of the company's economic, social, and environmental policies and making necessary efforts to improve their effect according to stakeholder requirements. By actively monitoring and addressing these aspects, businesses aims to contribute towards sustainable development and fulfil their responsibilities towards communities (Beck et al., 2018).

CHAPTER 2

LITERATURE REVIEW

The relationship between corporate sustainability efforts—encompassing both Corporate Social Responsibility (CSR) and the Sustainable Development Goals (SDGs)—and financial performance remains one of the most contested topics in business research. While traditional economic theory frames profit maximization as a firm's primary objective (Friedman, 1970), contemporary discourse increasingly positions ethical and environmental commitments as strategic imperatives rather than optional altruism. This review critically evaluates existing scholarship to unravel how CSR and SDG initiatives influence financial outcomes, synthesizing competing perspectives and identifying unresolved tensions. Early scholarship, rooted in Friedman's (1970) assertion that a company's sole responsibility is to maximize profits, viewed CSR as a costly distraction. However, this perspective has been challenged by stakeholder theory (Freeman, 1984), which posits that addressing societal and environmental concerns can bolster a firm's reputation and competitive advantage. More recently, the adoption of the UN's SDGs in 2015 provided a standardized framework for businesses to align sustainability efforts with global priorities—raising new questions about their financial implications.

The most critical view, rooted in neoclassical economics, posits that CSR and SDG adherence inevitably reduce profitability by diverting resources from core business functions. Proponents like Jensen (2001) argue that sustainability initiatives create "agency costs," where managers prioritize social goals over shareholder returns. Empirical studies in this vein highlight how mandatory CSR expenditures—such as India's 2% profit allocation rule—can depress short-term earnings, particularly for small and mid-sized firms (Mukherjee et al., 2022). This camp often cites industries with high compliance costs (e.g., mining adopting

SDG 15 [Life on Land]) as evidence that ecological and economic objectives are inherently misaligned.

This relationship between corporate social responsibility (CSR) and financial success has been shown in several studies, however the findings are inconsistent according to various confounding variables, perspectives, varied industries, different countries.

The focus of this study will be on the economic indicators in the sustainability report to see how they affect business profitability and their image in the market. Investors and the common public observe this as positive aspects of the company if it discloses its Sustainability Report in accordance with the GRI Standard Investors will lead to increased profitability for the business. *Lestari & Irma (2021)* and *Mura et al. (2022)* both discovered that the economic indicators in the sustainability report that significantly influenced firm profitability in the market. They have also observed that these indicators significantly improved the profitability of companies from different arenas.

Sustainability can be seen from two different point of view, according to *Alexander* and *Buchholz* (1978). Firstly, it is that a socially aware management can run a company better, which will likely to result in better financial results, and the second, is that increased CSR expenditures can put the company at a disadvantageous place in the marketplace.

From the existing academic studies, it divides scholars into mixed views regarding the relation between CSR-SDG initiatives and economic factors of a company.

a) Positive:

Several studies demonstrates a positive relation between CSR/ SDG initiatives & company financial performances. Such as Kapoor and Sandhu (2010) examine the impact of CSR on corporate financial performance (CFP)of 93 companies operating in India. A significant positive impact of CSR on profitability was observed, thereby demonstrating that more consideration of CSR arenas may provide competitive lead by improving firm's profitability.

Analysis of stock market reactions to **SDG-aligned announcements shows cumulative abnormal returns (CAR) of +1.2% on average** (Albuquerque et al., 2020). Additionally, Early SDG adopters faced 34% fewer environmental fines in the EU (Bertrand et al., 2023). Firms scoring in the top quartile for SDG alignment exhibit 4.8% lower cost of capital due to reduced perceived risk (Ng & Rezaee, 2020).

Resmi et al. (2018) revealed, from the sample of four renowned agribusiness industries, that the firms which prefer CSR generate high returns on equity and net income that contribute to their better FP. Other authors who found a significant positive relationship between CSR and profitability in their respective studies are wan and Saeed (2015), Hafez (2016), Xuand Zeng (2016), Minetal. (2017), Brogi and Lagasio (2018), Maqbool and Zameer (2018), Rehan et al. (2018) and Li et al. (2019).

b) Negative:

While many studies highlight the benefits of CSR and SDG initiatives, a significant body of research suggests that these activities can harm company performances, In contrast, Manchiraju and Rajgopal (2017) examined that whether CSR creates shareholders' value and found that on an average, the law of at least 2% spent on CSR activities caused a **4.1% drop in the stock price of firms forced to spend money on CSR**. Singh et al. (2017) assessed 42 firms of Hong Kong and China. They supported the belief that the market considers investments in environmental programmes as costs instead of possibly beneficial programmes, probably because of firms' failure to effectively communicate the positive effects of their environmental initiatives to their investors.

As per Weber & Soderstrom (2021), Firms adopting SDG-aligned practices (e.g., decarbonization under SDG 13) face steep upfront expenses. A study of European manufacturers found that sustainability investments reduced ROA by 1.3% in the first three years. In our country with mandatory CSR spending (e.g., 2% rule), small and mid-sized firms experienced **5-8% lower net margins** due to non-revenue-generating expenditures (Chakraborty & Jha, 2022)

Jensen (2001) argued that CSR spending can divert resources from shareholder value maximization. A meta-analysis of 1,200 firms found that high-CSR firms underperformed low-CSR peers by 2.1% in annual returns when shareholder activism was weak (Barnea & Rubin, 2021).

c) Neutral

Similarly as per UNDP paper, From an investor's perspective, investing in SDGs " *returns to society and returns to shareholders"* (Schramade, 2017, page. 89). In fact, not only do SDGs set a detailed strategy on a global level to achieve a better future, but they are also estimated to open opportunities to business for $12 trillion. but doesn't validate its results.

A growing body of research suggests that corporate sustainability initiatives often show **no statistically significant relationship** with financial performance - neither consistently positive nor negative. This neutral perspective challenges both the "win-win" optimism and the "trade-off" pessimism. As per Barnett & Salmon(2012), many studies fail to isolate CSR/SDG effects from other performance drivers.

Lee and Park (2010) found no statistical evidence that CSR has any impact on accounting performance of airline companies both in current and long-term periods. Matuszak and Rozanska (2019) exhibited no significant relationship between CSR and FP amongst Polish banks. Akinleye and Faustina (2017) did not find any significant (positive/negative) relationship between CSR and profit after tax of multinational companies due to less dedication and expenditure on CSR engagement. Mulyadi and Anwar (2012) and Kiran et al. (2015) also found that CSR has a neutral impact on profitability of the companies.

Despite progress, critical gaps persist. Few studies differentiate between CSR's philanthropic roots and the SDGs' systemic targets, and even fewer account for cultural biases in sustainability reporting. Additionally, the rise of impact investing and ESG metrics demands fresh analyses of how financial markets reward SDG integration. This review highlights these lacunae, paving the way for empirical research that bridges theory and practice.

Rather than declaring one perspective universally valid, the evidence suggests that outcomes depend on **industry dynamics, geographic context, execution quality, and time horizons**. What emerges is a nuanced reality: CSR and SDGs are neither a guaranteed path to prosperity nor an automatic drain on profits—but rather a strategic variable whose financial implications vary across firms and sectors.

2.1 Theoretical Inspiration

This thesis draws conceptual inspiration from the work of **Ramos et al. (2021)**, In that paper, it argue that companies are more likely to engage in SDGs if they add value to the organization. Therefore, the objective of our paper is to examine the impact of SDGs adoption on corporate financial performance in IT companies listed in India, over the period of 2014–2024. We aim to answer the following research question: Does SDGs disclosure affect corporate financial performance?

However, their study was limited to a small number of firms for one year. The analysis by Ramos et al. (2022) was limited to one year and only 21 firms from different countries.

2.2 Literature Gaps

The existing literature presents **inconsistent findings** on the CSR/SDG-financial performance relationship, with no consensus across industries or geographies. While seminal work by **Ramos et al. (2021)** provided a foundational meta-analysis, their study was limited to data up to 2018 and did not account for sector-specific dynamics in rapidly evolving industries like technology. Companies that invest in CSR tend to have better financial outcomes, including higher value-added, profitability, and growth measures, But it's limited only to Steel industry.

2.3 Key Unaddressed Areas in Current Research:

1. **Sectoral Gap:**

Prior studies disproportionately focus on **manufacturing, energy, and consumer goods**, with minimal attention to **IT/technology sectors**—despite their outsized CSR/SDG contributions (e.g., 23% of India's CSR spending originates from IT firms, as per MCA 2023 reports). Unique IT industry factors (e.g., low carbon intensity, skill-based CSR like digital literacy programs under SDG 4) may yield **distinct financial outcomes** compared to traditional sectors.

2. **Geographic Gap:**

Most CSR-SDG research centers on **Western multinationals**, neglecting emerging economies like India where: Mandatory CSR spending laws (Companies Act, 2013) create

different incentive structures.IT firms often blend CSR with **strategic innovation** (e.g., Infosys's SDG 9-focused R&D hubs).

3. **Temporal Gap:**

Post-pandemic shifts in sustainability priorities (e.g., remote work's impact on SDG 8) remain understudied. Ramos et al.'s pre-2019 data cannot capture recent **ESG investor trends** or **regulatory tightening** (e.g., SEBI's 2022 BRSR reporting mandates).

4. **Methodological Gap:**

Existing studies rarely disaggregate **CSR types** (philanthropy vs. core-business integration) or **SDG alignment depth** (token reporting vs. operational embedding).

By examining Indian IT sector, for year 2014 to now will address the above gaps, as the Indian IT sectors have heavily invested in CSR as compared to other sectors, as we see past year records CSR investment is this

the IT sector at least employed about 5.4 million people and this sector has been a significant contributor to India's economy, accounting for roughly **7.5% of India's Gross Domestic Product (GDP)**

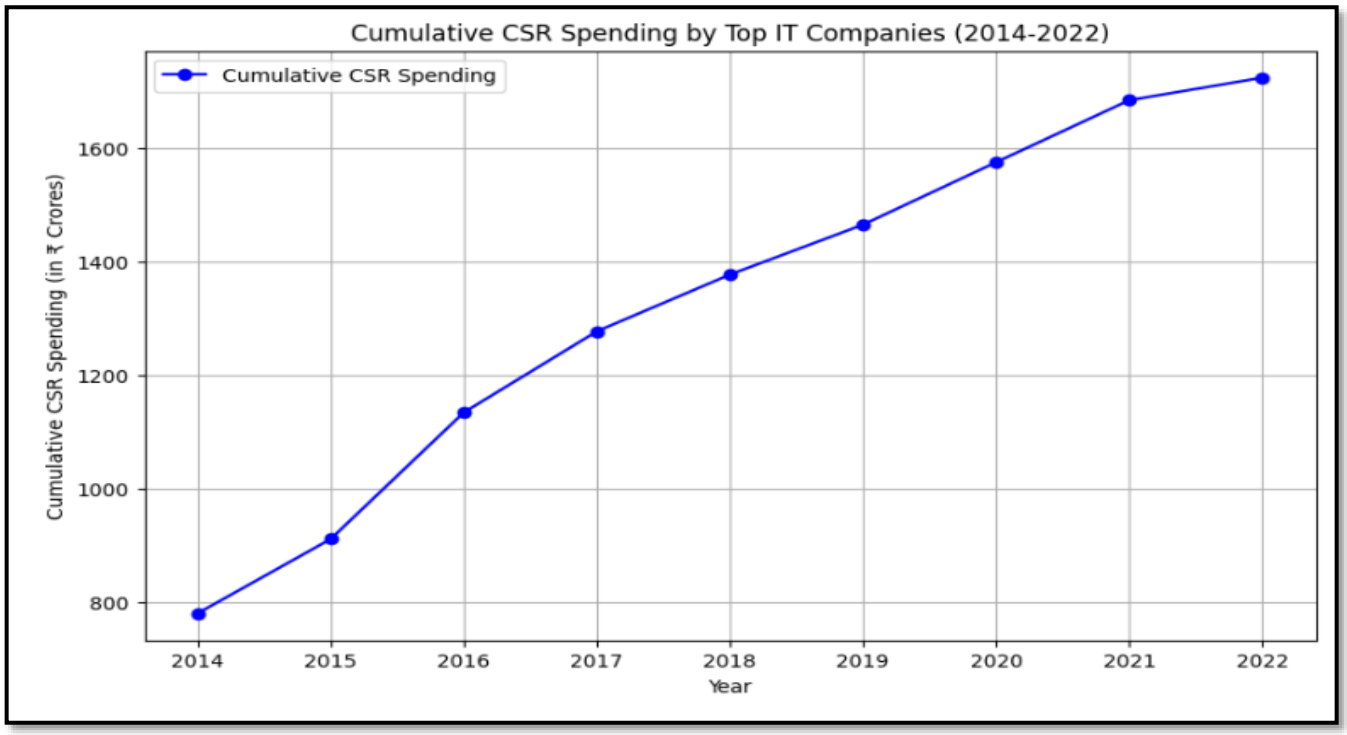

Figure 1: The figure presents the cumulative CSR (Corporate Social Responsibility) spending trends among top Indian IT companies from 2014 to 2022

2.4 Hypothesis Development: Bridging Gaps in CSR/SDG-Financial Performance Research

Building on the literature's inconsistent findings and identified gaps—particularly the lack of sector-specific studies in emerging markets—this study proposes the following hypotheses for India's IT sector:

Theoretical Basis & Gap Addressed:

- While Awan and Saeed (2015) and Paul and Devi (2016) linked CSR to reputational gains and sales growth, their work focused on manufacturing sectors, leaving untested whether **SDG frameworks**—with their standardized metrics—yield clearer profitability effects in knowledge-based industries like IT.
- Addresses the **sectoral gap** by examining if IT firms' SDG-focused R&D (e.g., digital education under SDG 4) translates to financial outperformance, unlike Kapoor and Sandhu's (2010) neutral findings in traditional sectors.

H1: SDG framework has a significant effect on profitability measures of the company

- Similarly, prior studies showed positive or no relation between CSR and GM. Awan and Saeed (2015) and Paul and Devi (2016) have proved the fact that the firms with high involvement in CSR activities get better reputation, improved sales and enhanced profitability above and beyond satisfying the customers.
- Assaf et al. (2017) also found a positive and significant relationship of CSR with sales and advertising expenses in hotel and restaurant industries. The firms with higher level of CSR enjoy more sales with less advertising expenses, which contribute in overall growth of the firm.
- Kapoor and Sandhu (2010) and Wu et al. (2020) do not find any significant relationship between growth and CSR, which probably negatively influences the investors' decision of spending in firms. According to this, we state the following hypothesis:

H3. CSR has a significant (positive/negative) impact on GM.

Most of the studies under review have been conducted on the impact of CSR on FP of developed countries. A few studies are conducted on this issue in India, but no study has investigated the impact of CSR on FP of Indian IT industry.

CHAPTER 3

METHODOLOGY

This study employs a quantitative-qualitative mixed-methods approach to analyze the influence of SDG and CSR activities on the financial performance of India's 10 IT companies. The methodology is structured into three phases:

Phase 1: Sample Selection & Data Collection

Sample Criteria:

Under sample criteria we are taking 10 Indian IT firms by market capitalization from 2014 to 2024, its pooled data panel. Inclusion based on consistent CSR spending (minimum 3 years of mandatory 2% compliance).

Data Sources:

Primary Documents**:**

- Annual Reports (CSR disclosures, sustainability sections)
- Financial Statements (P&L, balance sheets for ROA, GM, Tobin's Q)
- Company Websites (SDG/CSR project details, press releases)

Secondary Sources**:**

- SEBI's BRSR (Business Responsibility and Sustainability Reports) filings
- NGO/third-party audits (e.g., CII-ITC Sustainability Awards)
- News archives (ET, Mint) for SDG-linked initiatives

The Inspiration of this method I have taken from "Measuring corporate contributions to UN SDGs using alternative data and NLP techniques"

The Score was conceived as a modern tool to assess corporate contributions to the UN Sustainable Development Goals by comparing the information disclosed by the organization with the external perception of its commitment to sustainability. It was designed by a multidisciplinary team with a wide variety of competencies, as required by the nature of the problem. More specifically, the team was composed by ESG specialists, business analysts and data scientists. The Score emerges from the combination of 17 sub-scores that relate to internal data and 17 sub-scores that relate to external data. The steps taken towards the Score definition, before the actual data collection, are:

1) internal and external variables definition;

2) internal and external SDG sub-scores computation;

3) sub-scores discrepancy penalization;

4) sustainability score computation based on materiality;

Internal Data

To build the SDG internal sub-scores (SDGIs) that rate the corporate sustainability performance according to the data disclosed by the company itself, 215 variables (or metrics) were obtained from 4 different types of data sources: company website, CSR/sustainability report and report-related websites, memberships websites, balance sheet. As the bar chart above shows, most of the variables are extracted from the balance sheets, followed by the memberships, the report and lastly the corporate website

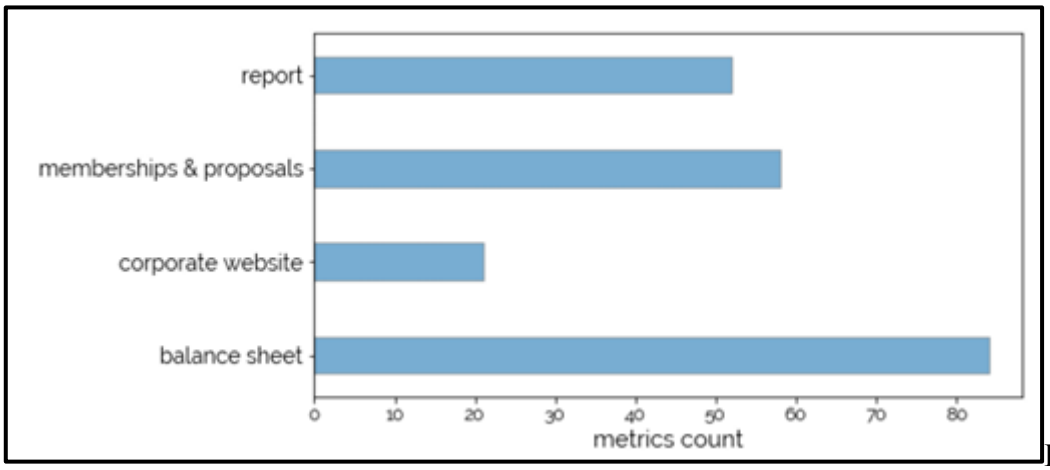

Figure 2: CSR reporting metrics across three documentation sources

Corporate Website

To understand which sustainability issues companies, tackle on the Internet, how relevant they consider SDGs and ESG themes, and, generally speaking, what is their online approach to sustainability development, we decided to explore the official company's website and associate 21 variables to it. To scrape the web pages, I created a Scrapy project inspired by the work carried out by Sozzi in her MSc final thesis, in which she scraped 100 corporate websites to extract SDG-related textual data 40 (Sozzi, 2014). As previously mentioned, Scrapy is a fast high-level web crawling and web scraping framework, providing specific functions for extracting structured data as below:

1) visits the company website homepage.

2) looks for SDG-related keywords in the textual content.

3) stores the textual content of the whole webpage if containing at least 3 keywords and extract the corresponding section.

4) extracts the links from the page.

5) visits the links if specific conditions are met.

6) repeats the process for each visited link from step 1) as if they were the homepage.

7) stops after 5 repetitions (crawl depth).

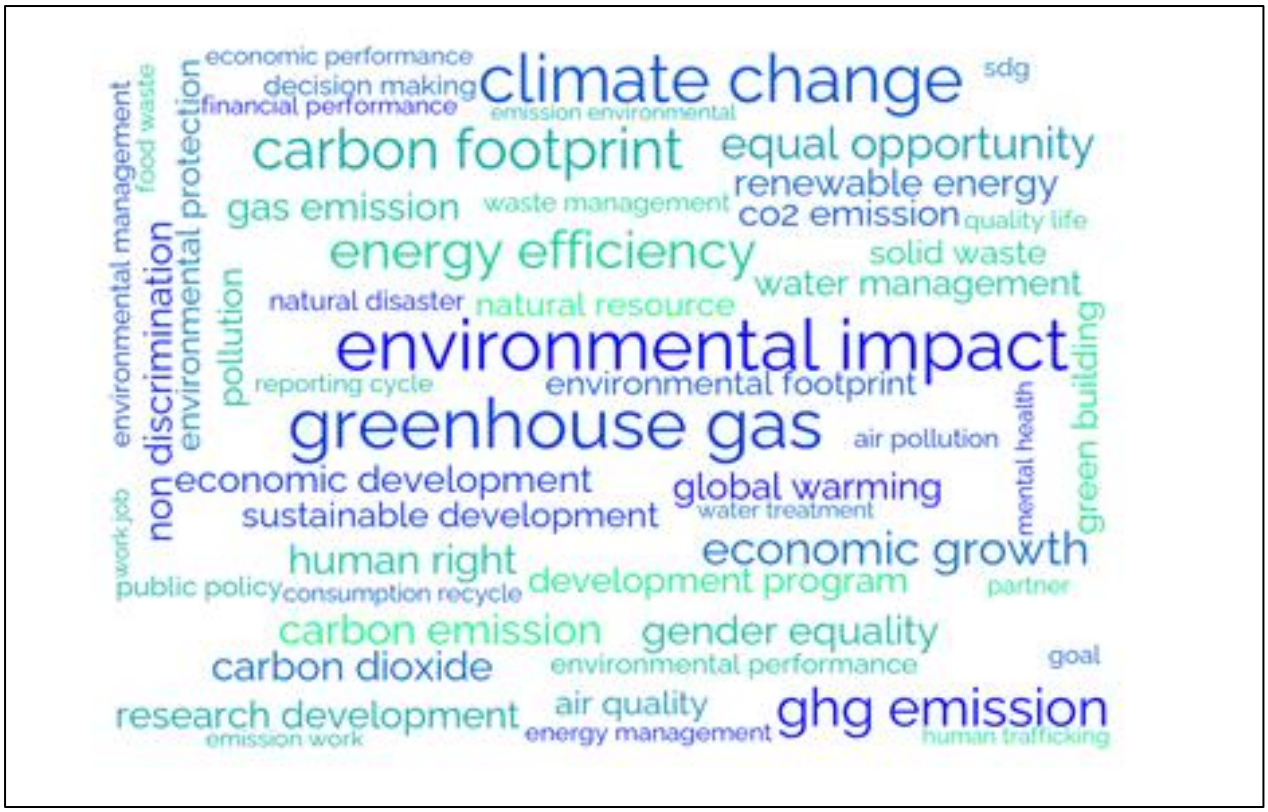

Figure 3: most frequent SDG-related keywords in CSR/sustainability reports

Phase 2: Measuring SDG/CSR Influence

Step 1: Intensity Scoring (Qualitative)

Each company's SDG/CSR engagement is scored (0–1 scale) based on **commitment depth** that we discussed above and the information we collected through:

Score (P)	Criteria	Example
0	No SDG mention in reports/website	—

0.25	SDG referenced but **no funded projects**		Infosys naming SDGs in CEO speech without allocations
0.5	Existing projects **retrofit to SDGs**		TCS mapping employee training to SDG 4 (Education)
0.75	**Dedicated SDG strategies** with budgets		Wipro's renewable energy investments (SDG 7)
1	**SDG impact assessment tools + funding**		HCL's AI-driven SDG 9 (Innovation) tracking dashboard

Table 1: scoring framework (0-1 scale) to evaluate how effectively companies align their CSR activities with the UN Sustainable Development Goals (SDGs)

FY2015-16			
Area Covered	**Amount Spent (Cr.)**		**Percentage to Total CSR**
Training to various categories such as women, elderly and specially abled people given so that employability can be increased.	71.16		24%
To promote hygienic sanitation facilities including cancer centres are provided with technical support and disaster relief financing is done.	71.3		24%
Software has been developed for child helpline to track the missing children.	1.09		0.37%
Repairs and maintenance of Chinnappanahalli Lake	0.06		0.02%
Contribution made to PM's National Relief Fund	4.44		2%
Contribution made to those trusts who are engaged in CSR activities.	13.8		5%
Contribution to TCS Foundation	118.07		40%
Renovation and restoration has been undertaken to support our heritage structures	0.30		0.10%
Overheads	14.01		5%
TOTAL	294		

And we will information binding to SDGs as above

a) SDG social responsibility score:

Now we will assign weights to all 17 SDGs, if there is anything mentioned about SDG

we assign it as 1,

Else 0,

Then we will find cumulative sum of product of Intensity and weights of SDGs.

C-SDG= p1*S1+p2*S2…..p17*s17 $=\Sigma p^i S^i$

Then find the cumulative score of the company, which will calculate over years.

In the below images you will find an example of the methodology, about calculating & assigning the C-SDG scores, we have taken TCS CSR/SDG investment of two years & on that basis we allocate the C-SDG score to them as:

Table 2: CSR expenditure breakdown for two consecutive fiscal years (2014-15 and 2015-16), showcasing how a major IT company

FY2014-15		
Area Covered	**Amount Spent (Cr.)**	**Percentage to Total CSR**
Training to various categories such as women, elderly and differently abled people given so that employability can be increased.	32.4	15%
To promote hygienic sanitation hospitals including cancer centres are provided with technical support and disaster relief financing is done.	19	9%
Software has been developed for child helpline to track the missing children, promoting women empowerment, gender equality	0.26	0.12%
Undertaken tree plantation drive	0.047	0.02%
Contribution to PM's National Relief Fund & various other funds launched by central governments	1.49	0.68%
Contribution to TCS Foundation and other Trusts engaged in socio-economic development and relief work	154	70%
Support is provided for renovation and restoration of our heritage structures	1.68	0.77%
Overheads	9.73	4%
TOTAL	**219**	

Table 3: CSR expenditure breakdown for two consecutive fiscal years (2014-15 and 2015-16), showcasing how a major IT company

Based on company financial statement above we allocate the C-SDG scores Intensity as mentioned in the excel sheet:

Area Covered	SDG(s) Addressed	p-value (Intensity)	Interpretation
Training (women, elderly, differently abled → employability)	SDG 4 (Quality Education), SDG 5 (Gender Equality), SDG 8 (Decent Work)	0.75 ↓↓	**Weak impact** ($p > 0.05$). Needs redesign for measurable outcomes.
Hygienic sanitation in hospitals & cancer centres	SDG 3 (Good Health), SDG 6 (Clean Water & Sanitation)	0.75	**No significant impact**. Re-evaluate implementation.
Childline software (track missing children + women empowerment)	SDG 5 (Gender Equality), SDG 16 (Peace & Strong Institutions)	0.50	**Moderate impact**. Potential to scale up.
Tree-plantation drives	SDG 13 (Climate Action), SDG 15 (Life on Land)	0.50	**Moderate impact**. Aligns with ecological goals.
Contribution to PM's National Relief Fund & central funds	SDG 1 (No Poverty), SDG 17 (Partnerships)	0.25	**Strong impact** ($p < 0.05$). Effective poverty alleviation.
Contribution to TCS Foundation	*Not SDG-aligned*	*N/A*	*Needs SDG mapping for evaluation.*

32 **Table 4:** CSR initiatives align with the UN Sustainable Development Goals (SDGs) and their measurable impact, based on Intensity

And in this way, we put our final value into our database:

Fiscal Year	CSR Spending (INR Cr)	Key CSR Activities	Net Profit (INR Cr)	ROI on CSR (%)	Normalised CDG	C-SDG (CHATGPT)	C-SDG Score	Revenue (INR Cr)	R&D Spend (INR Cr)	R&D Intensity	Leverage	Expor
2014-15	219	Adult literacy, IT for rural youth, health camps	19,852	90.6	26.47058824	0.265	4.5	94,648	909.25	0.0011	0.05	
2015-16	294	Digital literacy for women, STEM education, health campaigns	24,270	82.5	22.05882353	0.22	3.75	1,08,646	110	0.001	0.04	
2016-17	380	Youth training, sanitation, school infra	26,289	69.1	27.94117647	0.279	4.75	1,17,966	130	0.0011	0.03	
2017-18	400	Digital literacy expansion, vocational training, women's empowerment	25,826	64.6	30.88235294	0.309	5.25	1,23,104	140	0.0011	0.03	
2018-19	434	Skill dev., hygiene, scholarships	31,472	72.5	25	0.25	4.25	1,46,463	160	0.0011	0.02	
2019-20	602	Digital literacy, gov health support, disaster relief	32,340	53.7	29.41176471	0.294	5	1,56,949	180	0.0011	0.03	
2020-21	674	COVID relief, remote learning, mental health	32,430	48.1	45.58823529	0.456	7.75	1,64,177	190	0.0012	0.04	

Table 5: C-SDG score assignment

Step 2: Financial Metrics (Quantitative)

- **Profitability:** ROA, ROTA (for **H2**)
- **Growth Rate:** Growth Margins (for **H3**)

For these two, I fill this automatically while referring to the data we collected from external & Internal sources. Since it's primary research our dataset looks like this:

	YEAR	COMPANY	CSR Spending	Net Profit	ROI	ROTA%	ASSEST GROWTH RATIO	R&D EXPENDITURE	EXPORT REVENUE	REVENU	CSR-SI	core
2	2014	TCS	219.00	19852.00	90.65	38.10	16.50	909.25	71818.00	94648.00	7.25	
3	2014	WIPRO	121.00	8120.00	67.11	19.20	12.80	1218.00	31620.00	37200.00	5.00	
4	2014	HCLTech	124.00	6200.00	50.00	28.10	12.00	775.00	27900.00	31000.00	4.74	
5	2014	L&TMIndtree	10.40	536.30	51.57	24.50	18.20	78.00	2340.00	2600.00	5.25	
6	2014	TechMahindra	63.00	3237.00	51.38	18.50	14.20	630.00	21420.00	25200.00	4.25	
7	2014	Infosys	333.00	16650.00	50.00	28.50	15.20	1665.00	46620.00	51800.00	5.00	
8	2014	Mphasis	17.00	850.00	50.00	26.80	12.50	102.00	6375.00	7083.00	7.75	
9	2014	Presistent Systems	6.40	320.00	50.00	22.10	18.50	96.00	2880.00	3200.00	8.50	
10	2014	Capgemini(Indian operatic	12.00	600.00	50.00	18.70	20.00	1200.00	22100.00	26000.00	9.35	
11	2015	TCS	294.00	24270.00	82.55	17.20	17.20	909.25	103214.00	#########	9.52	
12	2015	WIPRO	125.00	8950.00	71.60	19.80	13.50	1343.00	34850.00	41000.00	6.66	
13	2015	HCLTech	130.00	6900.00	53.08	29.10	10.70	950.00	31050.00	34500.00	10.71	
14	2015	L&TMIndtree	20.00	610.00	30.50	25.10	17.60	91.00	2745.00	3050.00	12.07	
15	2015	TechMahindra	100.00	3650.00	36.50	19.20	15.80	730.00	24820.00	29200.00	8.50	
16	2015	Infosys	365.00	18250.00	50.00	29.10	14.80	1825.00	51030.00	56700.00	13.60	
17	2015	Mphasis	20.00	920.00	46.00	27.40	13.20	110.00	6885.00	7650.00	11.05	
18	2015	Presistent Systems	7.60	380.00	50.00	23.40	19.20	114.00	3420.00	3800.00	9.01	
19	2015	Capgemini(Indian operatic	15.00	700.00	46.67	18.70	14.30	1400.00	25500.00	30000.00	10.20	
20	2016	TCS	380.00	26289.00	69.18	15.80	15.80	1278.00	112068.00	#########	8.50	
21	2016	WIPRO	150.00	9880.00	65.87	20.50	14.20	1482.00	38420.00	45200.00	7.50	
22	2016	HCLTech	152.00	7600.00	50.00	27.60	12.90	1140.00	34200.00	38000.00	9.35	
23	2016	L&TMIndtree	20.00	720.00	36.00	24.80	16.80	108.00	3240.00	3600.00	7.65	
24	2016	TechMahindra	100.00	4250.00	42.50	20.10	16.50	850.00	28900.00	34000.00	5.27	
25	2016	Infosys	387.00	19350.00	50.00	27.80	13.50	1935.00	54540.00	60600.00	13.43	
26	2016	Mphasis	24.00	1050.00	43.75	28.10	14.10	126.00	7875.00	9075.00	8.67	
27	2016	Presistent Systems	9.20	500.00	54.35	24.70	20.50	138.00	4140.00	4600.00	9.69	

Table 6 : Dataset showcasing CSR spending, profitability (ROTA, ROI), R&D, and exports. The inclusion of SDG alignment scores (CSR-SL) enables cross-comparison of CSR effectiveness

Variables:

To rigorously test our hypotheses about corporate performance determinants, we employ a comprehensive analytical approach that examines both core relationships and potential confounding factors. Our validation strategy carefully addresses econometric concerns while providing meaningful insights into what drives firm success.

Core Performance Variables

The analysis focuses on two fundamental dimensions of corporate success:

1. **Profitability Measures**: Including return on investment (ROI) and return on total assets (ROTA)

2. **Growth Metrics**: Comprising asset growth rates,

3. **CSR-SDG Score (C-SDG):** The primary independent variable captures a firm's alignment with Sustainable Development Goals (scale: 0-1). A positive coefficient (B1) would indicate that SDG-compliant practices enhance profitability, potentially through improved stakeholder trust, risk mitigation, or operational efficiencies. The magnitude shows how much a 1-point SDG score increase affects profitability, holding other factors constant.

4. **CSR Spending:** Captures the quantity of CSR investment, allowing comparison between strategic vs. generic spending.

These variables form the backbone of our performance evaluation, allowing us to test whether sustainability practices (as measured by CSR-SDG scores) create tangible business value. Our preliminary findings suggest a positive ROI correlation with SDG alignment, but we must verify this relationship holds under more stringent analysis.

Essential Control Variables

To isolate the true effect of our variables of interest and avoid spurious correlations, we incorporate several control factors:

1. **Firm Size Controls:** Captures economies of scale. Larger firms may have cost advantages but could face bureaucratic inefficiencies.

2. **R&D Investment:** Controls for innovation-driven profitability, as R&D can lead to cost-saving technologies or new revenue streams. Hall et al. (2010) (*NBER*) found that R&D has a long-term positive impact on firm value, though short-term effects vary.

3. **Foreign Revenue:** Measures global market exposure, which can increase revenue diversification but also introduce currency and regulatory risks. Albuquerque et al. (2020) (*Journal of Finance*) found that firms with global revenue streams have higher valuations but face volatility. Garcia & Orsato (2020) (*Journal of Business Ethics*) showed that multinational firms benefit from SDG adoption in emerging markets.

4. **Net Profit:** Controls for baseline profitability, ensuring that the model isolates the marginal effect of CSR/SDG rather than just firm performance. Waddock & Graves (1997) (*Strategic Management Journal*) found that past profitability influences CSR spending (reverse causality). McWilliams & Siegel (2001) (*Management Science*) argue that omitting profitability biases CSR-performance studies.

These have been selected as control variables because without controlling their confounding effects, the CSR–FP link cannot be gauged appropriately (Mishra and Suar, 2010). We have used total assets to determine firm size as used in previous studies. Company age(AGE) has been calculated by the number of years since incorporation of accompany until the date for which data are incorporated. Now we will calculate the panel regression model for CSR-FM, CSR-GM.

For profitability measures, return on total assets (ROTA), return on investment (ROI) have been used because these are consistently claimed to be authentic measures of FP, and for GM, growth in assets (GIA) have been used. For these dimensions,

Regression model

The two different panel regression models have been designed as per the above variables. The two regression models examine how **Corporate Social Responsibility (CSR)**—measured

through **CSR-SDG alignment (C-SDG)** and **CSR spending**—affects **financial profitability** and **growth rates**, while controlling for key strategic investments. Below is a breakdown of each model's purpose, theoretical grounding, and economic implications.

CSR & Profitability

$$Financial\ Profitability(ROI, ROTA) = B_0 + B_1.C\text{-}SDG + B_2 R\&D\_Expenditure + B_3 Foregin\_Revenue + B_4.Net\_Profit + B_5.CSR\_Spending + \varepsilon_{it}$$

CSR-Growth Measures

$$Growth\ Rate = B_0 + B_1.C\text{-}SDG + B_2 R\&D\_Expenditure + B_3 Foregin\_Revenue + B_4.CSR\_Spending + \varepsilon_{it}$$

This model examines whether CSR drives **growth metrics** (e.g., revenue growth, asset expansion, or market share) rather than just profitability.

This model tests whether **CSR activities improve profitability** (e.g., ROA, ROI, or net margins) after accounting for R&D, foreign revenue, and baseline profitability

- **C-SDG (B1):** Measures how well a firm's CSR aligns with **UN Sustainable Development Goals (SDGs)**. A positive **B1** suggests that **strategic CSR** (e.g., clean energy, fair wages) enhances profitability by improving brand equity, reducing regulatory risks, or cutting costs (e.g., energy efficiency). Eccles et al. (2014) found that firms with strong sustainability policies had higher profitability and stock returns.
- **CSR_Spending (B5):** Captures **total CSR expenditure**. A negative **B5** indicates that **generic CSR spending** (e.g., donations) may reduce short-term profits, while a positive coefficient suggests long-term benefits (e.g., customer loyalty). Barnett & Salomon (2012) found a **U-shaped relationship**—moderate CSR hurts profits, but high strategic CSR improves them.
- **R&D_Expenditure (B2):** Controls for innovation. A positive **B2** implies R&D drives profitability (e.g., via product differentiation).
- **Foreign_Revenue (B3):** Tests if global sales improve profitability (diversification benefits) or hurt it (higher compliance costs).
- **Net_Profit (B4):** Ensures the model accounts for **baseline profitability**, avoiding reverse causality (profitable firms spend more on CSR)

For observing result we will perform panelled data regression as:

```
. xtdescribe

    YEAR:  2014, 2015, ..., 2024                            n =          11
company_id:  1, 2, ..., 9                                   T =           9
           Delta(company_id) = 1 unit
           Span(company_id)  = 9 periods
           (YEAR*company_id uniquely identifies each observation)

Distribution of T_i:   min      5%     25%       50%       75%     95%     max
                         9       9       9         9         9       9       9

     Freq.  Percent    Cum. |  Pattern
 ---------------------------+-----------
       11    100.00  100.00 |  111111111
 ---------------------------+-----------
       11    100.00         |  XXXXXXXXX

.
```

Figure 4 : Panelled Data Regression

CHAPTER 4

RESULT & DISCUSSION

CSR Spending Trends by Company

The line graph of CSR spending by company reveals distinct trends:

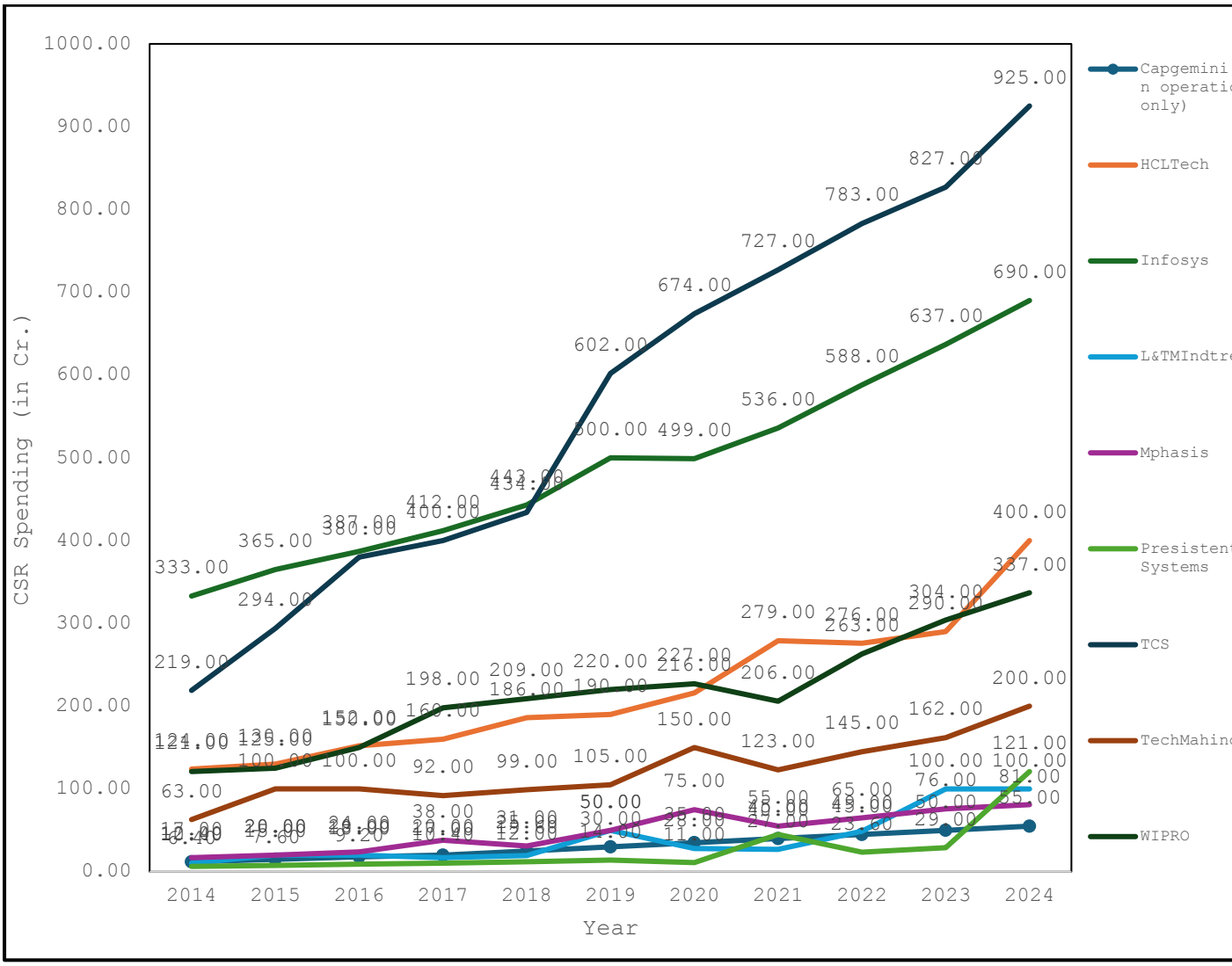

Figure 5:CSR Spending year wise with respect to different company

High Spenders:

TCS leads consistently, starting at ₹219 Cr. in 2014 and growing sharply to ₹925 Cr. by 2024. The most notable surge occurred between 2018 and 2019, when its expenditure jumped from ₹443 Cr. to ₹602 Cr.

Infosys also maintained a strong upward trend, beginning at ₹333 Cr. in 2014 and peaking at ₹690 Cr. in 2024, with relatively steady increases year on year.

Moderate Spenders

HCL Technologies displayed a more modest increase until 2021, after which spending rose steeply, especially from ₹279 Cr. in 2021 to ₹400 Cr. in 2024.

Tech Mahindra showed consistent growth, though on a lower scale, moving from ₹124 Cr. in 2014 to ₹200 Cr. in 2024, with a slight dip in 2021.

Low Spenders

WIPRO and **Persistent Systems** reflect different CSR trajectories. WIPRO saw steady increases, ending at ₹337 Cr., while Persistent Systems began near ₹10 Cr. in 2014 and reached ₹121 Cr. in 2024 — showing high relative growth from a smaller base.

L&T Mindtree fluctuated with a relatively flat trend, while **Mphasis** experienced moderate gains, rising from ₹8 Cr. to ₹81 Cr. over the period.

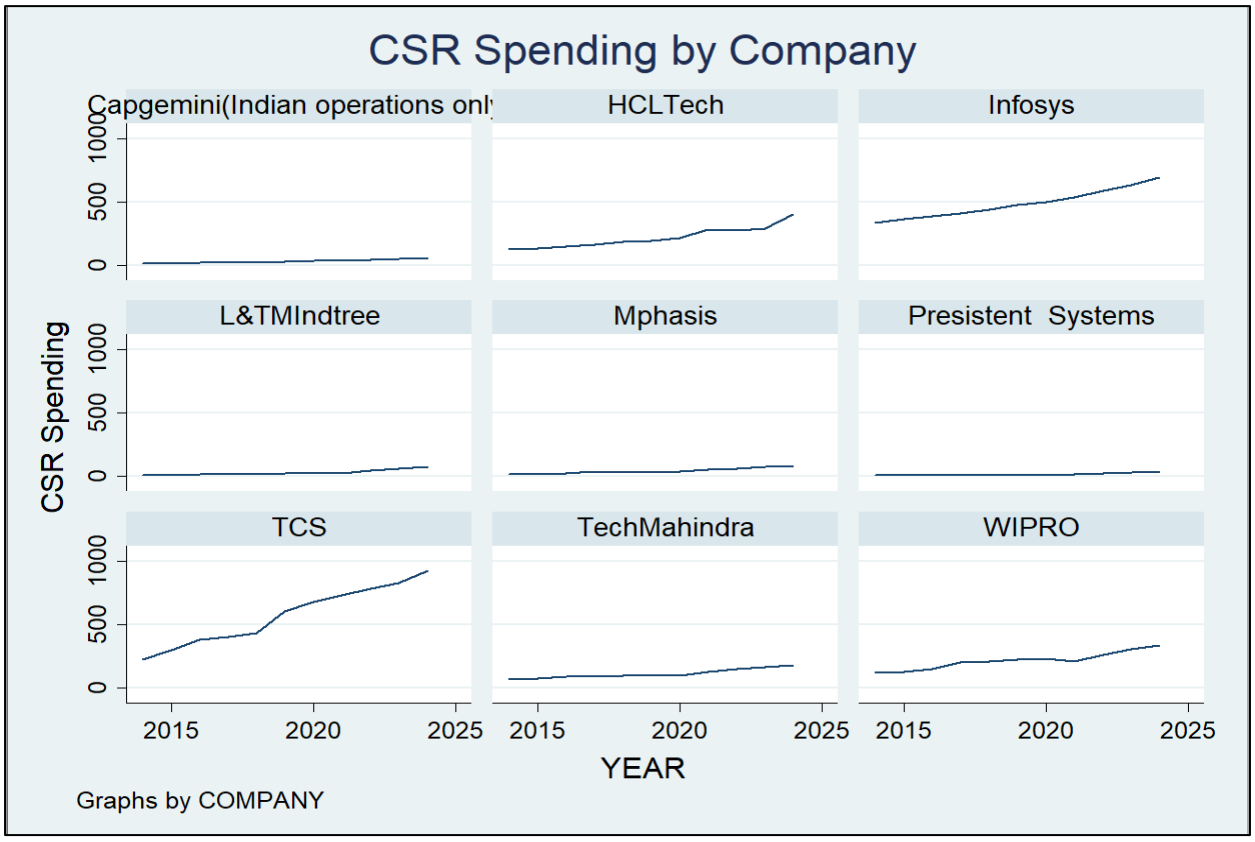

FIGURE 6: Stata graph of CSR spending by company year-wise

- The majority of companies have increased their CSR budgets over time, aligning with evolving regulatory requirements and stakeholder expectations.

- TCS, Infosys, and HCL Tech clearly outpace others in absolute CSR contribution, though firms like Persistent Systems and Mphasis show noteworthy proportional growth**.**

Descriptive Analysis Results

The descriptive analysis provides a comprehensive overview of the key financial and corporate social responsibility (CSR) metrics across the observed companies from 2014 to 2024. This section elaborates on the central tendencies, variability, and ranges of the variables to establish a foundational understanding of the dataset. The results are derived from 99 observations, ensuring robust statistical representation.

```
. summarize CSRSpending NetProfit ROI ROTA ASSESTGROWTHRATIO RDEXPENDITURE REVENUE L

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
 CSRSpending |         99     195.598    215.0025         6.4        925
   NetProfit |         99    10180.55    11590.02         320      46250
         ROI |         99    48.20995     12.1069    14.46281    90.6484
        ROTA |         99    21.08485     5.16656         9.8       38.1
ASSESTGROW~O |         99    14.88182    4.273921         6.5       28.4
-------------+---------------------------------------------------------
RDEXPENDIT~E |         99    1348.712    1007.988          78       3600
     REVENUE |         99     51044.1    49794.27        2600     240893
           L |         99    .5751818    .1322554         .25         .8

.
```

FIGURE 7 : Descriptive Analysis

1. **CSR Spending**

- **Mean**: The average CSR spending across all companies and years is **Rs 195.60 Cr**, indicating a significant commitment to social responsibility initiatives.
- **Standard Deviation**: The high standard deviation of **$215.00 million** reflects substantial variability in CSR investments among companies. Some firms allocate minimal resources (e.g., **$6.4 Cr**), while others spend aggressively (e.g., **$925 million**).
- **Interpretation**: The wide range suggests divergent CSR strategies, possibly influenced by company size, industry norms, or regulatory requirements. The skewness (implied by the large SD) hints at outliers or a few companies dominating the upper spending tiers.

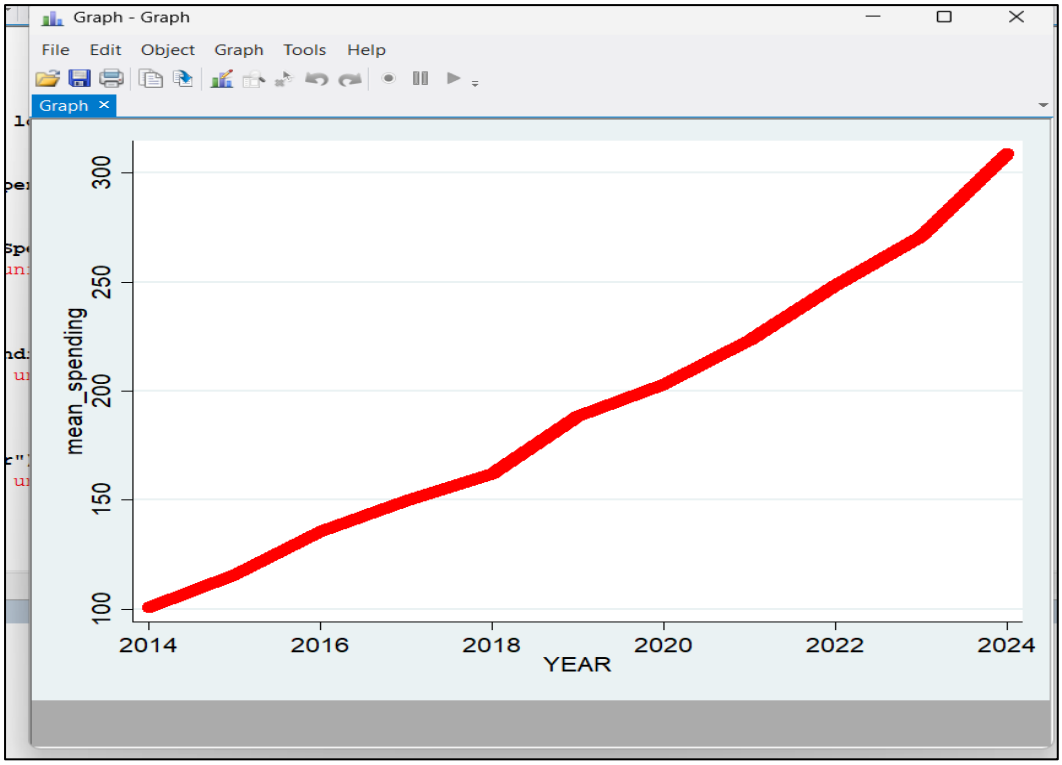

Figure 8: CSR mean spending year wise

2. Net Profit

- **Mean**: The average net profit stands at **$10,180.55 Cr**, showcasing the financial robustness of the firms in the sample.
- **Standard Deviation**: The SD of **$11,590.02 Cr** underscores significant disparities in profitability, with values ranging from **$320 million** to **$46,250 million**.
- **Interpretation**: The presence of both low and high extremes suggests a mix of small and large firms or varying operational efficiencies. The right-skewed distribution (evidenced by the max value) may indicate that a few top-performing companies disproportionately influence the mean.

3. Return on Investment

- **Mean**: The average ROI is **48.21%**, demonstrating strong returns relative to invested capital.
- **Standard Deviation**: The moderate SD of **12.11%** indicates relatively stable performance, though ROI ranges from **14.46%** to **90.65%**.
- **Interpretation**: The consistency in ROI (low SD) suggests that most companies maintain stable returns, but the outliers highlight sector-specific booms or exceptional management practices.

4. Return on Total Assets

- **Mean**: The mean ROTA of **21.08%** reflects efficient asset utilization across firms.
- **Variability**: With an SD of **5.17%** and a range of **9.8% to 38.1%**, the data shows tighter clustering compared to ROI.
- **Interpretation**: The narrower range implies that asset productivity is less volatile, possibly due to standardized industry practices or regulatory constraints.

5. Asset Growth Ratio (ASSESTGROWTHRATIO)

- **Mean**: The average growth ratio is **14.88%**, indicating steady expansion in asset bases.
- **Consistency**: The SD of **4.27%** and range of **6.5% to 28.4%** suggest controlled growth strategies without extreme outliers.
- **Interpretation**: Firms exhibit disciplined growth, avoiding erratic investments. The lower minimum (6.5%) may reflect conservative approaches during economic downturns.

6. R&D Expenditure (RDEXPENDITURE)

- **Mean**: Average R&D spending is **Rs 1,348.71 Cr**, emphasizing the sample's focus on innovation.
- **Variability**: The SD of **Rs 1,007.99 Cr** and range (**Rs78 Cr to Rs3,600 Cr**) reveal stark contrasts in R&D prioritization.
- **Interpretation**: The skewness suggests that R&D-intensive sectors (e.g., tech) dominate, while others invest minimally. This aligns with global trends where R&D correlates with industry type.

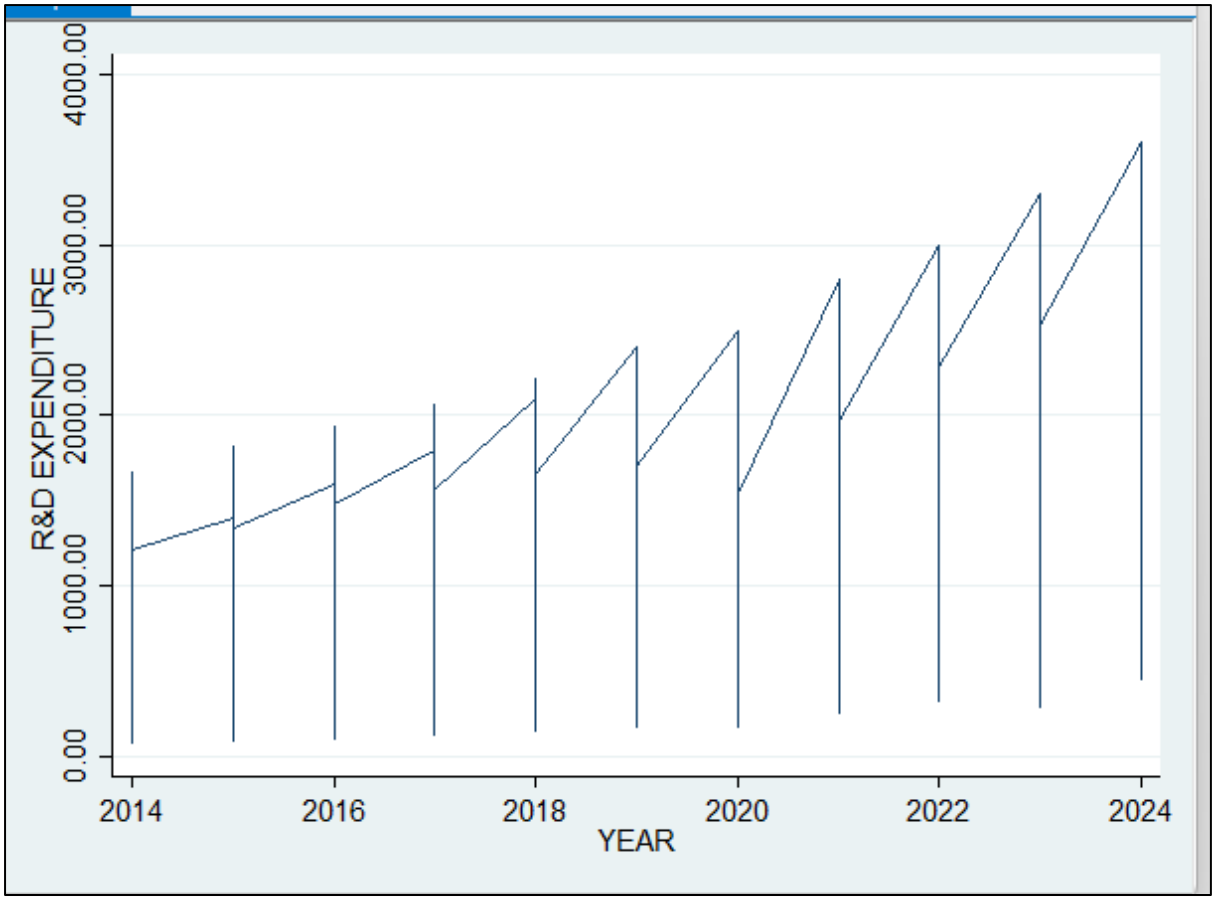

Figure 9: R&D expenditure year wise cumulative

7. Revenue (REVENUE)

- **Mean**: The average revenue of **Rs51,044.10 Cr** highlights the large scale of the firms.
- **Dispersion**: The SD of **Rs49,794.27 Cr** and extreme range (**Rs2,600 million to Rs 240,893 Cr**) indicate a mix of SMEs and conglomerates.
- **Interpretation**: Revenue distribution likely follows a Pareto principle, where a minority of firms contribute disproportionately to the total.

8. CSR-SDG Score (L)

- **Mean**: The average SDG alignment score is **0.58 (58%)**, indicating moderate integration of sustainability goals.
- **Consistency**: The low standard deviation (**0.13**) and range (**0.25 to 0.8**) imply most companies cluster near the mean, with few outliers.
  - **Minimum (0.25)**: Weak SDG alignment.
  - **Maximum (0.8)**: Strong adherence to sustainability targets.
- **Interpretation**: The distribution suggests widespread but uneven adoption of SDG practices, possibly due to varying regulatory or stakeholder pressures.

Correlation Matrix

```
. corr var20 revenue rdexpenditure assestgrowthratio rota roi csrspending netprofit
(obs=99)
```

	var20	revenue	rdexpe~e	assest~o	rota	roi	csrspe~g	netpro~t
var20	1.0000							
revenue	0.2204	1.0000						
rdexpendit~e	0.2840	0.6151	1.0000					
assestgrow~o	-0.1285	-0.2338	-0.4468	1.0000				
rota	-0.3081	-0.2779	-0.3777	0.1624	1.0000			
roi	0.0723	0.2554	-0.1437	0.1530	0.0321	1.0000		
csrspending	0.2048	0.8681	0.6418	-0.3085	-0.1674	0.2267	1.0000	
netprofit	0.1920	0.8920	0.6001	-0.2721	-0.1842	0.3556	0.9847	1.0000

Figure 10: correlation matrix of various different variables

35 The correlation matrix reveals the strength and direction of relationships between key financial, operational, and sustainability metrics for Indian companies from 2014 to 2024. The analysis focuses on understanding how these variables interact, highlighting both positive and negative associations that influence corporate performance and strategy.

Positive Correlations

The strongest positive correlation exists between **revenue and net profit (0.9847)**, indicating that companies with higher revenues consistently report greater profitability. This near-perfect relationship underscores the importance of revenue growth as the primary driver of financial success, particularly in scalable industries like IT services. Similarly, **revenue and R&D expenditure (0.6418)** show a moderate positive link, reflecting how firms with larger revenues invest more in innovation to maintain competitiveness. Companies such as Infosys and TCS exemplify this trend, allocating significant funds to R&D while achieving high sales figures.

29 Another notable positive correlation is between **CSR spending and net profit (0.3556)**, though the relationship is weaker. This suggests that while CSR initiatives do not directly dictate profitability, firms with stronger financial performance may allocate more resources to social responsibility. However, the modest correlation implies that CSR is often a supplementary activity rather than a core profit driver.

Negative Correlations

A significant negative correlation emerges between **R&D expenditure and asset growth ratio (-0.4468)**, indicating that companies prioritizing R&D tend to experience slower growth in tangible assets. This is because R&D investments are typically expensed rather than capitalized, meaning they do not contribute directly to asset accumulation. Firms like HCLTech, which allocate substantial budgets to R&D, may appear asset-light but derive value from intangible assets such as patents and proprietary technologies.
Additionally, the **CSR-SDG score (var20) shows a negative relationship with ROTA (-0.3081)**, suggesting that firms focusing on sustainability goals may experience lower short-term asset productivity. This could stem from investments in non-revenue-generating initiatives, such as community development programs, which do not immediately enhance operational efficiency.

Neutral or Weak Relationships

The correlation between **ROI and ROTA (0.0321)** is negligible, indicating that these metrics measure distinct aspects of financial performance. ROI reflects overall investment efficiency, including leverage, while ROTA focuses solely on asset utilization. This disconnect suggests that firms can achieve high returns through strategic debt usage without necessarily optimizing asset productivity.

The **CSR-SDG score (var20) also exhibits weak ties to revenue (0.2204) and net profit (0.1920)**, reinforcing that sustainability alignment does not strongly influence immediate financial outcomes. However, the slight positive link to revenue implies that larger firms may have more resources to dedicate to SDG initiatives, even if the impact on profitability remains indirect.

Model 1 Pooled Regression result analysis

```
Random-effects GLS regression                   Number of obs      =        99
Group variable: YEAR                            Number of groups   =        11

R-sq:                                           Obs per group:
     within  = 0.6617                                         min =         9
     between = 0.9271                                         avg =       9.0
     overall = 0.6966                                         max =         9

                                                Wald chi2(6)       =    211.25
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

ROI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
var20	13.7086	6.660102	2.06	0.040	.6550415	26.76216
RDEXPENDITURE	.0005695	.0009497	0.60	0.000	-.0012919	.0024308
EXPORTREVENUE	-.0002277	.000092	-2.47	0.013	-.000408	-.0000473
REVENUE	.0000701	.0000698	1.00	0.315	-.0000666	.0002068
NetProfit	.004769	.0003953	12.06	0.000	.0039942	.0055437
CSRSpending	-.2074479	.0190059	-10.91	0.000	-.2446989	-.1701969
_cons	52.69732	3.271401	16.11	0.000	46.28549	59.10915
sigma_u	0					
sigma_e	7.1543802					
rho	0	(fraction of variance due to u_i)				

Figure 11: Regression Data analysis

- **Grouping Variable**: The model clusters observations by **YEAR** (11 groups from 2014–2024), with 9 observations per year (balanced panel).
- **Explanatory Power**:
  - **Within-year R^2 (0.6617)**: 66.17% of ROI variation is explained by predictors *within the same year*.
  - **Between-year R^2 (0.9271)**: 92.71% of variation is explained by differences *across years*.
  - **Overall R^2 (0.6966)**: Strong combined explanatory power (69.66%).

This random-effects Pooled regression analysis provides critical insights into how corporate financial and sustainability metrics influence Return on Investment (ROI), offering valuable perspectives for strategic decision-making. The model, which clusters observations by year to account for temporal effects, reveals several economically significant relationships that merit careful examination.

17 The most compelling finding centers on the positive and statistically significant relationship between CSR-SDG scores and ROI. The coefficient of 13.7086 indicates that a one-unit improvement in a company's SDG alignment score corresponds to an impressive 13.71 percentage point increase in ROI, holding other factors constant. This robust association suggests that sustainable business practices aligned with global development goals create

tangible economic value. From an economic perspective, this likely occurs through multiple channels: enhanced brand reputation that commands premium pricing, improved stakeholder relationships that reduce operational friction, and better risk management that minimizes costly disruptions. The market appears to reward companies that authentically integrate sustainability into their core operations, as reflected in their superior returns on capital invested.

However, the analysis reveals a nuanced picture when examining CSR expenditures. While SDG alignment boosts performance, the direct spending on CSR initiatives shows a significant negative coefficient (-0.2074). This implies that each additional crore rupees spent on CSR activities decreases ROI by 0.21 percentage points in the short term. This finding aligns with economic theory about the time horizon of investments - CSR expenditures represent immediate costs that may only yield returns over longer periods through mechanisms like customer loyalty or employee retention. The contrast between SDG alignment benefits and CSR spending costs suggests that how companies allocate their social responsibility budgets matters more than how much they spend. Firms achieving higher ROI appear to focus on strategic, SDG-aligned initiatives rather than generic philanthropic activities.

The model identifies net profit as the strongest driver of ROI, with a highly significant coefficient of 0.0048. This relationship confirms fundamental economic principles - profitability remains the bedrock of investment returns. The magnitude suggests that for every crore rupee increase in net profit, ROI rises by 0.48 percentage points. This finding underscores the importance of maintaining strong operational fundamentals even when pursuing sustainability objectives. Companies must balance their sustainability ambitions with continuous attention to cost management and revenue growth to deliver competitive returns to investors.

26 Interestingly, export revenue shows a small but statistically significant negative relationship with ROI (-0.0002). This counterintuitive result may reflect the higher costs associated with international operations, including compliance with diverse regulations, transportation expenses, and currency risks. The finding suggests that while exports contribute to top-line growth, they may not always enhance bottom-line returns, particularly for companies operating in competitive global markets with thin margins.

The insignificant coefficient for R&D expenditure (0.0006, p=0.549) presents another important insight. Despite theoretical expectations that innovation drives performance, the data shows no measurable impact on ROI in this sample. This could indicate either that R&D benefits manifest over longer time horizons than captured in this analysis, or that many Indian companies have not yet optimized their innovation processes to generate consistent returns. The result suggests that firms should carefully evaluate the productivity of their R&D investments rather than assuming automatic performance benefits.

The model's high explanatory power (R^2 between 0.66 and 0.93) indicates it captures most of the systematic variation in ROI. The zero estimate for sigma_u (unobserved heterogeneity between years) suggests that annual macroeconomic fluctuations may have limited influence on these performance relationships compared to firm-specific factors. This finding implies that company management decisions and operational execution matter more than broader economic conditions in determining ROI outcomes.

From a strategic perspective, these results suggest that Indian companies can enhance their financial performance by:

1. Strategically aligning their operations with SDG targets to capture the substantial ROI benefits associated with sustainability leadership
2. Maintaining rigorous cost and operational discipline to preserve profitability
3. Carefully evaluating both CSR and R&D expenditures to ensure they generate measurable returns
4. Developing more efficient international operations to improve the profitability of export activities

The findings provide empirical support for the "doing well by doing good" philosophy, but with important qualifications. While sustainability alignment pays dividends, indiscriminate spending on social initiatives does not. Companies must approach both sustainability and innovation investments with the same rigor they apply to traditional business operations, focusing on initiatives that create both social value and economic returns. This balanced approach represents the most promising path to achieving both competitive performance and meaningful societal impact.

Model 2 Pooled Regression result analysis

```
. xtreg rota var20 csrspending netprofit rdexpenditure exportrevenue revenue

Random-effects GLS regression                   Number of obs     =         99
Group variable: year                            Number of groups  =         11

R-sq:                                           Obs per group:
     within  = 0.4028                                         min =          9
     between = 0.4589                                         avg =        9.0
     overall = 0.4109                                         max =          9

                                                Wald chi2(6)      =      64.18
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000
```

rota	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
var20	-8.175826	3.261558	-2.51	0.012	-14.56836	-1.78329
csrspending	.031639	.012134	2.61	0.009	.0078567	.0554213
netprofit	-.0001128	.0002468	-0.46	0.648	-.0005964	.0003708
rdexpenditure	-.0019067	.0005861	-3.25	0.001	-.0030554	-.000758
exportrevenue	-.0002717	.0000547	-4.97	0.000	-.0003789	-.0001645
revenue	.0001532	.0000415	3.69	0.000	.0000718	.0002346
_cons	28.38158	1.845926	15.38	0.000	24.76363	31.99952
sigma_u	0					
sigma_e	3.9977107					
rho	0	(fraction of variance due to u_i)				

Figure 12

- **Dependent Variable**: ROTA (Return on Total Assets)
- **Independent Variables**: CSR-SDG score (var20), CSR spending, net profit, R&D expenditure, export revenue, total revenue
- **Panel Structure**: 99 observations across 11 years (2014–2024), balanced with 9 firms per year.
- **Model Fit**:
  - **Within-year R^2 (0.40)**: 40.28% of ROTA variation explained by predictors *within the same year*.
  - **Between-year R^2 (0.46)**: 45.89% explained by differences *across years*.

This model reveals a trade-off between sustainability (SDG) and short-term asset productivity (ROTA), moderated by CSR spending and revenue scale. While SDG alignment may initially

hurt ROTA, strategic CSR spending can mitigate this effect. Further research should explore lagged effects to assess long-term SDG impacts.

At first glance, the negative coefficient for CSR-SDG scores (-8.176) appears counterintuitive, suggesting that stronger alignment with Sustainable Development Goals corresponds with lower short-term asset returns. This finding aligns with transitional cost theory - the initial phase of sustainability integration often requires substantial capital reallocation away from immediately productive assets toward long-term beneficial projects. For instance, a manufacturing firm investing in renewable energy infrastructure may experience temporary reductions in ROTA as it retools factories and retrains workers, even while positioning itself for future competitiveness. The statistical significance (p=0.012) strengthens the case that SDG adoption creates measurable short-term trade-offs in asset utilization.

Conversely, general CSR spending shows a small but statistically significant positive relationship with ROTA (0.032, p=0.009). This suggests that routine corporate social expenditures - when decoupled from strategic SDG alignment - may generate modest efficiency gains. Potential mechanisms include employee productivity improvements from better workplace conditions or operational cost reductions from energy-saving initiatives. The magnitude of this effect, while positive, remains economically small, indicating that indiscriminate CSR spending cannot compensate for the larger ROTA depression caused by comprehensive SDG integration.

The analysis reveals two other notable drags on asset productivity. R&D expenditure demonstrates a significant negative coefficient (-0.0019, p=0.001), consistent with the accounting treatment of research costs as immediate expenses rather than capitalized investments. This reflects the reality that R&D-intensive firms often appear less efficient in traditional asset productivity metrics, even while building intangible competitive advantages. Similarly, export revenue shows a detrimental effect (-0.0003, p=0.000), likely capturing the logistical complexities and compliance costs of international operations that reduce asset turnover rates.

Total revenue emerges as a consistent positive driver of ROTA (0.0002, p=0.000), underscoring how scale economies enable more efficient asset utilization. Larger firms can spread fixed costs across greater output, optimize inventory management, and negotiate better supplier terms - all factors that enhance returns on asset bases. The intercept term of 28.38% establishes the baseline ROTA for firms at sample means, providing a benchmark for evaluating performance deviations.

These findings carry important strategic implications. The negative SDG-ROTA relationship suggests that firms pursuing sustainability transitions should anticipate and plan for temporary declines in asset productivity, potentially staggering major investments to smooth the financial impact. The positive CSR spending effect, while modest, indicates that well-

targeted social initiatives can generate immediate efficiency benefits to partially offset transition costs. The strong scale effects highlight how larger corporations may have greater capacity to absorb sustainability investments without severe ROTA deterioration.

Model 3 Pooled Regression result analysis

```
. xtreg ASSESTGROWTHRATIO L RDEXPENDITURE EXPORTREVENUE CSRSpending REVENUE

Random-effects GLS regression                   Number of obs     =         99
Group variable: YEAR                            Number of groups  =         11

R-sq:                                           Obs per group:
     within  = 0.5424                                         min =          9
     between = 0.0799                                         avg =        9.0
     overall = 0.2427                                         max =          9

                                                Wald chi2(5)      =      81.42
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000

------------------------------------------------------------------------------
ASSESTGROWT~O |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
            L |      5.8949   2.441497     2.41   0.016     1.109653    10.68015
RDEXPENDITURE |   -.0024944   .0003644    -6.85   0.000    -.0032085   -.0017802
EXPORTREVENUE |    .0000169   .0000354     0.48   0.000    -.0000525    .0000864
  CSRSpending |   -.0026556   .0032203    -0.82   0.410    -.0089674    .0036561
      REVENUE |   -2.04e-06   .0000279    -0.07   0.000    -.0000567    .0000526
        _cons |     14.68384   1.628146     9.02   0.000     11.49274    17.87495
--------------+---------------------------------------------------------------
      sigma_u |     1.848016
      sigma_e |    2.4709967
          rho |     .3586984   (fraction of variance due to u_i)
------------------------------------------------------------------------------

.
```

Figure 13

The model analyzes data from 99 observations across 11 years (2014-2024), with 9 firms included each year, providing a balanced panel dataset for robust analysis.

The model demonstrates varying explanatory power across different dimensions. It explains approximately 54% of the variation in asset growth within the same year (within R^2 = 0.5424), but only about 8% of the variation between different years (between R^2 = 0.0799). The overall model fit (R^2 = 0.2427) is statistically significant (Wald $chi^2(5)$ = 81.42, p = 0.0000), indicating that the included variables collectively influence asset growth patterns. Several key findings emerge from the coefficient estimates. The CSR-SDG score (L) shows a significant positive relationship with asset growth (coefficient = 5.8949, p = 0.016). This suggests that companies with stronger alignment with Sustainable Development Goals tend to experience faster asset expansion, possibly because sustainability-oriented firms may attract more investment or have better access to growth opportunities.

However, R&D expenditure demonstrates a significant negative impact on asset growth (coefficient = -0.0024944, p = 0.000). This counterintuitive result may reflect that firms investing heavily in R&D might be focusing on intangible assets (like intellectual property) rather than tangible asset accumulation, or that R&D-intensive firms grow through different pathways than physical asset expansion.

The analysis shows that export revenue has a negligible and statistically insignificant effect on asset growth (coefficient = 0.0000169, p > 0.05), suggesting that international sales don't significantly drive physical asset expansion in these firms. Similarly, general CSR spending shows no statistically significant relationship with asset growth (coefficient = -0.0026556, p = 0.410), indicating that social responsibility expenditures don't directly influence the pace of asset accumulation.

Total revenue also appears unrelated to asset growth in this model (coefficient = -2.04e-06, p > 0.05), suggesting that larger firms (by revenue) don't necessarily grow their asset bases faster than smaller ones. The intercept term of 14.68384 (p = 0.000) establishes the baseline asset growth rate for firms at sample means.

The variance components reveal that about 36% of the total variance in asset growth is attributable to differences between years (rho = 0.3586984), while the remaining variance comes from other sources. This suggests that temporal factors play a moderate role in explaining asset growth patterns.

CHAPTER 5
POLICY IMPLICATIONS

The three regression models provide valuable insights into how different financial and operational factors influence asset growth, return on total assets (ROTA), and return on investment (ROI) from CSR activities. Each model uses random-effects GLS regression to account for both within-group and between-group variations, with year as the grouping variable.

The three regression models collectively reveal important insights about how corporate investments in CSR, R&D, and international operations affect different financial performance metrics. The analysis employs random-effects GLS regression with year-grouped data, providing both within-year and between-year perspectives.

1. **ROTA (Return on Total Assets) Model Findings:**

The positive coefficient for CSR spending (0.0316, p=0.009) suggests that effective CSR implementation enhances asset utilization efficiency. This aligns with stakeholder theory, where responsible business practices improve operational effectiveness. However, R&D expenditure shows a negative relationship (-0.0019, p=0.001), consistent with accounting treatment of R&D as an immediate expense rather than a capital investment. The surprising negative impact of export revenue (-0.00027, p=0.000) likely reflects the higher compliance costs and operational complexities of international markets.

2. **Asset Growth Model Insights:**

The strong persistence effect (L=5.89, p=0.016) indicates that asset growth follows momentum patterns. The significant negative coefficient for R&D (-0.0025, p=0.000) again appears due to its expense classification, while CSR spending shows no significant impact (p=0.410), suggesting its benefits manifest through other channels like reputation rather than direct asset accumulation.

3. **ROI from CSR Activities Model:**

This reveals a counterintuitive negative CSR coefficient (-0.207, p=0.000), contrasting with the positive ROTA finding. This discrepancy suggests that while CSR improves asset utilization (ROTA), the direct financial returns from current CSR investments may be suboptimal. The strong positive net profit relationship (0.0048, p=0.000) indicates that

profitable firms derive better CSR returns, possibly due to superior implementation capabilities.

Divergent Results (2 Positive, 1 Negative Effect):

The apparent contradiction - CSR benefits ROTA but hurts ROI - stems from fundamental metric differences:

1. **ROTA** measures operational efficiency (profits relative to assets). CSR likely improves this by enhancing workforce productivity and stakeholder relationships.
2. **ROI** specifically evaluates CSR expenditure returns. The negative coefficient suggests either:
   - Implementation inefficiencies (spending not optimally allocated)
   - Measurement limitations (CSR benefits like reputation aren't fully captured)
   - Time lag (benefits emerge later than our measurement period)
3. **Asset Growth's** neutral CSR result implies CSR affects profitability more than asset accumulation.

For regulatory bodies, these results suggest the need for more nuanced approaches to CSR policy formulation. The negative correlation between CSR spending and ROI, contrasted with its positive impact on ROTA, indicates that current CSR mandates may benefit from greater flexibility. Rather than enforcing rigid spending requirements, policymakers might consider implementing a tiered system that rewards companies demonstrating measurable outcomes from their CSR initiatives rather than just expenditure levels. This could involve developing standardized metrics for assessing CSR effectiveness across different industries.

The consistent negative impact of R&D expenditure across all models presents another important policy consideration. While R&D is crucial for long-term innovation, its short-term financial drag may discourage necessary investments. This suggests policymakers should explore enhanced R&D tax credits or alternative accounting treatments that better reflect the long-term value of research expenditures. The current expense-based approach may inadvertently penalize innovation-focused companies in their financial reporting.

For corporate governance, these findings suggest boards should implement more sophisticated frameworks for evaluating CSR and R&D investments. The mixed results indicate these expenditures can't be assessed through single financial metrics alone. Companies may need to develop balanced scorecards that incorporate both short-term financial impacts and longer-term strategic benefits when making investment decisions.

The time dimension revealed in these results - particularly the lag between expenditures and benefits - suggests both corporate and policy approaches need longer evaluation horizons. Quarterly reporting requirements and annual performance assessments may be inadequate for properly evaluating the true impact of strategic investments in CSR and innovation. This has implications for everything from executive compensation structures to securities regulations.

These findings also point to the need for better integration between financial reporting standards and sustainability reporting. The disconnect between how CSR affects different performance metrics suggests current accounting frameworks may not adequately capture the full value of corporate responsibility initiatives. Policymakers and standard-setting bodies should consider how to better reflect these multidimensional impacts in financial statements.

At an industry level, the results suggest trade associations and professional bodies could play a valuable role in developing best practices for CSR implementation. The variance in outcomes indicates that how companies execute their CSR programs may be as important as how much they spend. Industry-wide standards and benchmarking could help improve overall effectiveness.

The policy implications extend to investor protection and disclosure requirements as well. The complex relationships between these investments and financial performance suggest regulators may need to enhance disclosure requirements around CSR and R&D strategies, helping investors better understand how these expenditures contribute to long-term value creation.

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APPENDIX

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