

# A Comparative Study of Fair Value Hierarchy Disclosures in Infosys Technologies Ltd and Tata Consultancy Services Under Ind As 113

Dr. Mohan Kumar T P<sup>1</sup>, Dr. Nishanth A Naidu<sup>2</sup>, Sunil G E<sup>3</sup>, Bhoomika B<sup>4</sup> and Ramya M<sup>5</sup>

<sup>1</sup>Assistant Professor, Department of Commerce Govt. First Grade College, KR Sagara, Mandya-571607, Karnataka.

<sup>2</sup>Principal and HOD of Commerce, Department of Commerce, STG First Grade College, Chinakurali, Pandavapura, Mandya, Karnataka.

<sup>3</sup>Guest Faculty, Department of Commerce, Maharani's Arts, Commerce and Management College for Women, Maharani Cluster University, Bengaluru-560001, Karnataka.

<sup>4</sup>Guest Faculty, Department of Commerce, Maharani's Arts, Commerce and Management College for Women, Maharani Cluster University, Bengaluru-560001, Karnataka.

<sup>5</sup>Guest Faculty, Department of Management, Maharani's Arts, Commerce and Management College for Women, Maharani Cluster University, Bengaluru-560001, Karnataka.

Received: 03/10/2025;

Revision: 25/10/2025;

Accepted: 20/11/2025;

Published: 26/12/2025

\*Corresponding author: Dr. Mohan Kumar T P ([drmohanmysore@gmail.com](mailto:drmohanmysore@gmail.com))

**Abstract:** In the context of global financial integration, aligning accounting practices plays a crucial role in promoting transparency and comparability across borders. India has embraced this shift by adopting Indian Accounting Standards (Ind AS), which closely mirror international frameworks. Ind AS 113, in particular, offers a structured method for measuring fair value through a three-tiered hierarchy determined by the visibility of inputs. This study presents a comparative assessment of fair value hierarchy disclosures made by Tata Consultancy Services (TCS) and Infosys Ltd. for the fiscal year 2023–24. Through the use of content analysis in addition to statistical tests, Chi-square Test & Fisher's Exact Test conducted under R programming. The current study evaluates both the number and monetary value of financial instruments disclosed at Levels I, II, and III. Although the two firms did not show any difference regarding the number of instruments, the reported monetary values for each level showed vast differences. These findings add depth to the understanding of the depth and quality of fair value disclosures by Indian IT firms and add to the overall debate in the literature regarding corporate transparency.

**Keywords:** Infosys, TCS, Fair Value Measurement, Fair Value Hierarchy, Ind AS 113

## INTRODUCTION

As globalization has continued to progress, most countries have accepted or aligned their accounting standards with the "International Financial Reporting Standards (IFRS)", published by the "International Accounting Standard Board (IASB)". This change, was intended to achieve consistency, reliability, and transparency to assist stakeholders in making informed decisions. India used a convergence approach to adopt the "Indian Accounting Standards (Ind AS)", which are modeled after IFRS. "The Minister of Corporate Affairs (MCA)" has published 41 Ind AS, urging phased implementation depending on company-specific criteria like listing status, net worth, and business nature. This step-by-step process facilitates the smooth transition and avoids compliance challenges. Such standard include Ind AS 113, which is particularly renowned for application in fair value measurement, in accordance with IFRS 13. It defines "fair value as the price which would be received to dispose of an asset or paid to allocate a liability within a transactional model at measurement date". This approach revolves market-based inputs relative to internal valuations. Fair value reporting enhances the relevance and the accuracy of financial reports while discouraging activities like earning manipulation. It is especially important when analyzing financial products that are market-sensitive. For consistency, Ind AS 113 designates inputs into three categories:

**Level I-** "Quoted prices in active markets": These are active market prices for similar instruments. Easily available and reliable

**Level II – Observable Inputs:** These inputs rely on indirect market information, like interest rates or yield curves, applicable to similar instruments.

**Level III– Unobservable Inputs:** These are based on internal models, projections, and estimates where market data is unavailable.

## REVIEW OF LITERATURE

Fair value accounting has received significant interest because it could help create timely and relevant financial information. Barth and Landsman (1995) were the first to show that it could help them do that, particularly in rapidly changing markets. Penman (2007) mentioned the issue of reliability, particularly for Level II inputs, because they were driven by managerial assumptions. Landsman (2007) pointed out that both Levels II and III produced increased volatility and estimation risk, which created questions about the reliability of reported financials as a result. During the global financial crisis, Procházka (2011) emphasized that FVA was a reflection, not a cause, of economic downturns, reinforcing its role in financial transparency. Kaur (2013) discussed the collaboration between IASB and FASB in promoting fair value as a forward-looking alternative to historical cost.

Samaddar (2014) critiqued the uneven adoption of FVA in India, noting gaps in technical clarity and application. Skoda and Slavikova (2015) argued that fair value and historical cost accounting serve complementary purposes. Goh, Ng, and Yong (2015) provided empirical evidence showing that investors place more weight on Level I disclosures while discounting Level III due to their subjective nature. Kavya and Noorbasha (2017) observed hesitation among Indian firms to apply fair value to non-financial assets. Rani and Suneja (2018) found varying levels of compliance and quality in Ind AS 113 disclosures among Indian firms. An ICAI (2020) review showed significant inconsistencies in disclosure practices among top Indian companies. Most recently, Sharma and Mehta (2021) found that while TCS and Infosys showed better compliance due to international exposure, differences in classification and disclosure still impacted comparability.

### Research Gap

Although both global and Indian scholars have explored fair value accounting, limited research exists comparing firm-level fair value hierarchy disclosures under Ind AS 113. Particularly in the IT sector, studies rarely investigate the transparency, consistency, and alignment of such disclosures with regulatory expectations. This study fills that void by comparing TCS and Infosys, offering insights into the fair value practices of two of India's leading IT firms.

### Research Purpose and Objectives

- ❖ To explore the reporting and disclosure requirements of Ind AS 113 related to fair value measurement.
- ❖ To assess how the fair value hierarchy is practically applied in corporate financial reporting.
- ❖ To compare the fair value hierarchy disclosures and practices of Tata Consultancy Services Ltd. and Infosys Technologies Ltd.

### Research Questions

- ❖ What are the key reporting and disclosure requirements of Ind AS 113 concerning fair value measurement and hierarchy?
- ❖ How are Levels I, II, and III of the fair value hierarchy applied in the recognition and measurement of financial instruments?
- ❖ What differences and similarities exist in the fair value disclosures of Tata Consultancy Services Ltd. and Infosys Technologies Ltd.?

### Hypothesis of the study

**H1:** Differences are significantly exists in the number of financial instruments disclosed under Level I between Infosys Ltd. and TCS.

**H2:** Differences are significantly exists in the number of financial instruments disclosed under Level II between Infosys Ltd. and TCS.

**H3:** Differences are significantly exists in the number of financial instruments disclosed under Level III between Infosys Ltd. and TCS.

**H4:** Differences are significantly exists in the monetary value of instruments disclosed under Level I between Infosys Ltd. and TCS.

**H5:** Differences are significantly exists in the monetary value of instruments disclosed under Level II between Infosys Ltd. and TCS.

**H6:** Differences are significantly exists in the monetary value of instruments disclosed under Level III between Infosys Ltd. and TCS.

## RESEARCH METHODOLOGY

This study adopts a secondary data-based analytical approach to evaluate fair value disclosure practices under Ind AS 113. No primary data collection was undertaken. The research focuses on the application of the standard by companies listed on the BSE 30 Index.

### 7.1 Scope of the Study

The research is confined to Tata Consultancy Services Ltd. and Infosys Technologies Ltd., both of which comply with Ind AS and are listed on the BSE 30. The study period is the financial year 2023–24 and uses publicly available data from annual reports.

### 7.2 Population and Sample

**7.2.1 Population:** All companies listed on the BSE 30 Index following Ind AS.

**7.2.2 Sample:** Tata Consultancy Services Ltd. and Infosys Technologies Ltd., selected using convenience sampling based on data relevance and availability.

### 7.3 Content Analysis

Content analysis is applied to interpret qualitative data from annual reports regarding fair value measurement. It includes:

- ❖ Classification of instruments under Levels I, II, and III
- ❖ Monetary values disclosed under each level
- ❖ Comparative assessment between the two firms

This approach enables structured evaluation and quantification of narrative financial disclosures.

### 7.4 Data Collection

Secondary Sources:

- ❖ Annual Reports of TCS and Infosys for FY 2023–24
- ❖ Ind AS 113, related IFRS standards, and regulatory frameworks
- ❖ Published compliance tools and checklists

### 7.5 Statistical Tools and Techniques

- ❖ Fisher's Exact Test: Used with limited sample sizes to evaluate connections between categorical variables
- ❖ Chi-Square Test: Applied to examine independence among disclosure practices across the hierarchy levels.
- ❖ R Programming: Employed for data handling, visualization, and statistical validation.

## DATA ANALYSIS AND RESULTS

Finding out if there are notable variations in the categorization and valuation of financial instruments reported under Level I,

II, and III by Tata Consultancy Services and Infosys Technologies Ltd. for the fiscal year 2023–2024 is the main goal of the data study.

**Table 1: Firms have recognized certain assets and liabilities measured through Level I inputs, derived directly from quoted market prices.**

Hierarchy Level		Level I		
SL NO	Financial Instruments	TCS	INFOSYS	TOTAL
<b>I. Financial Assets</b>				
1	Units held in short-term mutual funds	1	0	1
2	Holdings in publicly traded equity securities	1	0	1
3	Central government securities and treasury instruments	1	1	2
4	Listed debentures and bonds issued by corporations	1	0	1
5	Currency-linked derivative assets (unrealized gains)	0	0	0
6	Short-term commercial borrowing papers	1	0	1
7	Bonds exempted from income tax	0	1	1
8	Liquid-based mutual fund investments	0	1	1
9	Funds maturing on fixed future dates (target maturity units)	0	1	1
10	Time-bound certificates of deposit	0	0	0
11	Non-convertible debentures with fixed interest returns	0	1	1
12	Listed shares held for investment purposes	0	1	1
13	Preference shares held as part of financial instruments	0	0	0
14	Other listed investment instruments (unspecified)	0	0	0
15	Unrealized gains from outstanding currency forward/option contracts (derivatives)	0	0	0
<b>II. Financial Liabilities</b>				
1	unsettled foreign exchange contracts (at the fair value)	0	0	0
2	Unrealized losses from derivative contracts linked to currency risks	0	0	0

(Source: Annual Report 2023-24)

**Table 2: The firms have recognized assets and liabilities categorized as Level II, valued using market-based inputs that are observable but not quoted prices.**

Hierarchy Level		Level II		
SL NO	Financial Instruments	TCS	INFOSYS	TOTAL
<b>I. Financial Assets</b>				
1	Units held in short-term mutual funds	0	0	0
2	Holdings in publicly traded equity securities	0	0	0
3	Central government securities and treasury instruments	0	1	1
4	Listed debentures and bonds issued by corporations	0	0	0
5	Currency-linked derivative assets (unrealized gains)	1	0	1
6	Short-term commercial borrowing papers	0	1	1
7	Bonds exempted from income tax	0	0	0
8	Liquid-based mutual fund investments	0	0	0
9	Funds maturing on fixed future dates (target maturity units)	0	0	0
10	Time-bound certificates of deposit	0	1	1
11	Non-convertible debentures with fixed interest returns	0	1	1
12	Listed shares held for investment purposes	0	0	0
13	Preference shares held as part of financial instruments	0	0	0

14	Other listed investment instruments (unspecified)	0	0	0
15	Unrealized gains from outstanding currency forward/option contracts (derivatives)	0	1	1
<b>II. Financial Liabilities</b>				
1	unsettled foreign exchange contracts (at fair the value)	1	0	1
2	Unrealized losses from derivative contracts linked to currency risks	0	1	1

(Source: Annual Report 2023-24)

**Table 3: The companies have reported certain Assets &Liabilities under Level III of the fair value hierarchy, where valuations rely on unobservable inputs and internal assumptions.**

Hierarchy Level		Level III		
SL NO	Financial Instruments	TCS	INFOSYS	TOTAL
<b>I. Financial Assets</b>				
1	Units held in short-term mutual funds	0	0	0
2	Holdings in publicly traded equity securities	1	0	0
3	Central government securities and treasury instruments	0	0	0
4	Listed debentures and bonds issued by corporations	0	0	0
5	Currency-linked derivative assets (unrealized gains)	0	0	0
6	Short-term commercial borrowing papers	0	0	0
7	Bonds exempted from income tax	0	0	0
8	Liquid-based mutual fund investments	0	0	0
9	Funds maturing on fixed future dates (target maturity units)	0	0	0
10	Time-bound certificates of deposit	0	0	0
11	Non-convertible debentures with fixed interest returns	0	0	0
12	Listed shares held for investment purposes	0	1	1
13	Preference shares held as part of financial instruments	0	1	1
14	Other listed investment instruments (unspecified)	0	1	1
15	Unrealized gains from outstanding currency forward/option contracts (derivatives)	0	0	0
<b>II. Financial Liabilities</b>				
1	Liabilities arising from unsettled foreign exchange contracts (at fair value)	0	0	0
2	Unrealized losses from derivative contracts linked to currency risks	0	0	0

(Source: Annual Report 2023-24)

**Table 4: The companies disclosed various Assets &Liabilities that are categorized under Level I, II, and III of the fair value hierarchy, depending on the type and availability of valuation inputs.**

Particulars	Tata consultancy services		Infosys technologies Ltd	
	F.I	%	F.I	%
Level I	5	62.5	6	40
Level II	2	25	6	40
Level III	1	12.5	3	20
Total	8	100	15	100

**INDEX: FI- FINANCIAL INSTRUMENTS**

Given the smaller sample size and the categorical in nature of the data, **Fisher’s Exact Test** was employed to determine whether the differences in the number of FIs disclosed under each level between TCS and Infosys are statistically significant. The test was conducted separately for each level using 2x2 contingency tables. R programming language was used to perform the analysis. The hypotheses tested were:

- **H1:** Differences are significantly exists in the number of financial instruments disclosed under Level I between Infosys Ltd. and TCS.
- **H2:** Differences are significantly exists in the number of financial instruments disclosed under Level II between Infosys

Ltd. and TCS.

- **H3:** Differences are significantly exists in the number of financial instruments disclosed under Level III between Infosys Ltd. and TCS.

## RESULTS OF FISHER’S EXACT TEST

**Table 5: Level I Comparison**

Particulars	TCS	INFOSYS	Row Sum
Level I	5	6	11
Not Level I	3	9	12
Col sum	8	15	23

$$P = \frac{\binom{R_1}{a} \cdot \binom{R_2}{c}}{\binom{N}{C_1}} \approx (p - value)$$

$$P = \frac{\binom{11}{5} \cdot \binom{12}{3}}{\binom{23}{8}} \approx (0.4003231)$$

❖ P value = 0.4003

❖ Significance level =0.05 (5%)

Interpretation: The null hypothesis is upheld since the p-value of 0.4003 is higher than 0.05. This suggests that, at the 5% significance level, there is no statistically significant difference between the two companies' Level I disclosures.

**Table 6: Level II Comparison**

Particulars	TCS	INFOSYS	Row Sum
Level II	2	6	8
Not Level II	6	9	15
Col sum	8	15	23

$$P = \frac{\binom{R_1}{a} \cdot \binom{R_2}{c}}{\binom{N}{C_1}} \approx (p - value)$$

$$P = \frac{\binom{8}{2} \cdot \binom{15}{6}}{\binom{23}{8}} \approx (0.6570)$$

❖ P value = 0.6570

❖ Significance level =0.05 (5%)

Interpretation: The null hypothesis is upheld because the p-value of 0.6570 is higher than 0.05. This suggests that, at the 5% significance level, there is no statistically significant difference between the two companies' Level I disclosures.

**Table 7: Level III Comparison**

Particulars	TCS	INFOSYS	Row Sum
Level III	1	3	4
Not level III	7	12	19
Col sum	8	15	23

$$P = \frac{\binom{R_1}{a} \cdot \binom{R_2}{c}}{\binom{N}{C_1}} \approx (p - value)$$

$$P = \frac{\binom{4}{1} \cdot \binom{19}{7}}{\binom{23}{8}} \approx 1$$

- ❖ P value = 1.0000
- ❖ Significance level = 0.05 (5%)

**Interpretation:** The null hypothesis is upheld because the p-value of 1.0000 is higher than 0.05. This suggests that, at the 5% significance level, there is no statistically significant difference between the two companies' Level I disclosures.

**Fig. 1. R Script Used for Conducting Fisher’s Exact Test and Result**

```
> # Level 1
> # -----
> level1_matrix <- matrix(c(5,6,3,9),nrow = 2,byrow = TRUE)
> colnames(level1_matrix) <- c("TCS", "Infosys")
> rownames(level1_matrix) <- c("Level1", "Not_Level1")
> test_level1 <- fisher.test(level1_matrix)
> odds_ratio_level1 <- (level1_matrix[1,1] * level1_matrix[2,2]) / (level1_matrix[1,2] * level1_matrix[2,1])
>
> # Level 2
> # -----
> level2_matrix <- matrix(c(2,6,6,9),nrow = 2,byrow = TRUE)
> colnames(level2_matrix) <- c("TCS", "Infosys")
> rownames(level2_matrix) <- c("Level2", "Not_Level2")
> test_level2 <- fisher.test(level2_matrix)
> odds_ratio_level2 <- (level2_matrix[1,1] * level2_matrix[2,2]) / (level2_matrix[1,2] * level2_matrix[2,1])
>
> # Level 3
> level3_matrix <- matrix(c(1,3,7,12),nrow = 2,byrow = TRUE)
> colnames(level3_matrix) <- c("TCS", "Infosys")
> rownames(level3_matrix) <- c("Level3", "Not_Level3")
> test_level3 <- fisher.test(level3_matrix)
> odds_ratio_level3 <- (level3_matrix[1,1] * level3_matrix[2,2]) / (level3_matrix[1,2] * level3_matrix[2,1])
>
> # Summarizing Results into a Table
> # -----
> result_table <- data.frame(
+   Level = c("Level 1", "Level 2", "Level 3"),
+   P_value = c(test_level1$p.value, test_level2$p.value, test_level3$p.value),
+   Odds_Ratio = c(odds_ratio_level1, odds_ratio_level2, odds_ratio_level3),
+   Alternative_Hypothesis = c(
+     ifelse(test_level1$p.value < 0.05, "Two-sided (Significant association)", "Two-sided (No significant association)"),
+     ifelse(test_level2$p.value < 0.05, "Two-sided (Significant association)", "Two-sided (No significant association)"),
+     ifelse(test_level3$p.value < 0.05, "Two-sided (Significant association)", "Two-sided (No significant association)")
+   )
+ )
>
> # Display the result table
> print(result_table)
  Level  P_value Odds_Ratio Alternative_Hypothesis
1 Level 1 0.4003231  2.5000000 Two-sided (No significant association)
2 Level 2 0.6570198  0.5000000 Two-sided (No significant association)
3 Level 3 1.0000000  0.5714286 Two-sided (No significant association)
```

To assess if there were any significant differences in the number of financial instruments disclosed under the Levels I, II, and III fair value hierarchies between Tata Consultancy Services and Infosys Technologies Ltd.. This R code conducted a Fisher's Exact Test, and the output provided P values and odds ratios for Levels I, II, and III. The disclosure practices of TCS and Infosys

do not differ statistically significantly across the three tiers of fair value hierarchy as each p value was greater than 0.05, as the report indicated. The objective of this research project is to see whether the financial instruments disclosed by Infosys Ltd. and TCS under the Levels I, II, and III fair value hierarchies differ significantly in the monetary values of the assets and/or liabilities.

**Table No. 8: The companies' Assets & Liabilities as of March 31, 2024, are arranged according to the fair value hierarchy's levels, as explained below. ₹ In Crore**

Hierarchy Level		Level I		
SL NO	Financial Instruments	TCS	INFOSYS	TOTAL
<b>I. Financial Assets</b>				
1	Units held in short-term mutual funds	2360	-	2360
2	Holdings in publicly traded equity securities	1	-	1
3	Central government securities and treasury instruments	24932	6835	31767
4	Listed debentures and bonds issued by corporations	3497	-	3497
5	Currency-linked derivative assets (unrealized gains)	-	-	-
6	Short-term commercial borrowing papers	939	-	939
7	Bonds exempted from income tax	-	1944	1944
8	Liquid-based mutual fund investments	-	1913	1913
9	Funds maturing on fixed future dates	-	431	431
10	Deposit certificates of Time-bound	-	-	-
11	Non-convertible debentures with fixed interest returns	-	3697	3697
12	Listed shares held for investment purposes	-	113	113
13	Preference shares held as part of financial instruments	-	-	-
14	Other listed investment instruments (unspecified)	-	-	-
15	Unrealized gains from outstanding currency forward/option contracts (derivatives)	-	-	-
<b>Total</b>		<b>31729</b>	<b>14933</b>	<b>46662</b>
<b>II. Financial Liabilities</b>				
1	Liabilities arising from unsettled foreign exchange contracts (at fair value)	-	-	-
2	Unrealized losses from derivative contracts linked to currency risks	-	-	-
<b>Total</b>		-	-	-

(Source: AR 2023-24)

**Table No. 9: The companies' Assets & Liabilities as of March 31, 2024, are arranged according to the fair value hierarchy's levels, as explained below. ₹In Crore**

Hierarchy Level		Level II		
SL NO	Financial Instruments	TCS	INFOSYS	TOTAL
<b>I. Financial Assets</b>				
1	Units held in short-term mutual funds	-	-	-
2	Holdings in publicly traded equity securities	-	-	-
3	Central government securities and treasury instruments	-	73	73
4	Listed debentures and bonds issued by corporations	-	-	-
5	Currency-linked derivative assets (unrealized gains)	141	-	141
6	Short-term commercial borrowing papers	-	4507	4507
7	Bonds exempted from income tax	-	-	-
8	Liquid-based mutual fund investments	-	-	-
9	Funds maturing on fixed future dates (target maturity units)	-	-	-
10	Time-bound certificates of deposit	-	2945	2945
11	Non-convertible debentures with fixed interest returns	-	257	257

12	Listed shares held for investment purposes	-	-	-
13	Preference shares held as part of financial instruments	-	-	-
14	Other listed investment instruments (unspecified)	-	-	-
15	Unrealized gains from outstanding currency forward/option contracts (derivatives)	-	81	81
<b>Total</b>		<b>141</b>	<b>7863</b>	<b>8004</b>
<b>II. Financial Liabilities</b>				
1	Liabilities arising from unsettled foreign exchange contracts (at fair value)	114	-	114
2	Unrealized losses from derivative contracts linked to currency risks	-	21	21
<b>Total</b>		<b>114</b>	<b>21</b>	<b>135</b>

(Source: AR2023-24)

**Table No. 10: The companies' Assets & Liabilities as of March 31, 2024, are arranged according to the fair value hierarchy's levels, as explained below. ₹ In Crore**

Hierarchy Level		Level III		
SL NO	Financial Instruments	TCS	INFOSYS	TOTAL
<b>I. Financial Assets</b>				
1	Units held in short-term mutual funds	-	-	-
2	Holdings in publicly traded equity securities	31	-	31
3	Central government securities and treasury instruments	-	-	-
4	Listed debentures and bonds issued by corporations	-	-	-
5	Currency-linked derivative assets (unrealized gains)	-	-	-
6	Short-term commercial borrowing papers	-	-	-
7	Bonds exempted from income tax	-	-	-
8	Liquid-based mutual fund investments	-	-	-
9	Funds maturing on fixed future dates (target maturity units)	-	-	-
10	Time-bound certificates of deposit	-	-	-
11	Non-convertible debentures with fixed interest returns	-	-	-
12	Listed shares held for investment purposes	-	2	2
13	Preference shares held as part of financial instruments	-	91	91
14	Other listed investment instruments (unspecified)	-	84	84
15	Unrealized gains from outstanding currency forward/option contracts (derivatives)	-	-	-
<b>Total</b>		<b>31</b>	<b>177</b>	<b>208</b>
<b>II. Financial Liabilities</b>				
1	Liabilities arising from unsettled foreign exchange contracts (at fair value)	-	-	-
2	Unrealized losses from derivative contracts linked to currency risks	-	-	-
<b>Total</b>		<b>-</b>	<b>-</b>	<b>-</b>

(Source: AR 2023-24)

**Table No. 11: The following table establishes how Assets & Liabilities are grouped within the fair value hierarchy as of March 31, 2024. ₹ In Crore**

Particulars	Tata consultancy services		Infosys technologies Ltd	
	AMT	%	AMT	%
Level I	31729	99.10	14933	64.94
Level II	255	0.80	7884	34.29
Level III	31	0.10	177	0.77
Total	32015	100	22994	100

The monetary values of financial instruments disclosed by Infosys Ltd and TCS under each fair value level were collected. To test hypotheses H4, H5, and H6, which posit significant differences between the two companies at each level, the **chi-square test** of independence was employed. This test is appropriate for examining whether the distribution of monetary values differs significantly between the two firms across the three levels. R programming language was used to perform the analysis. The hypotheses tested were:

- H4: Infosys Ltd. and TCS's monetary values of the instruments they disclosed under Level I differ significantly.
- H5: Infosys Ltd. and TCS's monetary values of the instruments they disclosed under Level II differ significantly.
- H6: Infosys Ltd. and TCS's monetary values of the instruments they disclosed under Level III differ significantly.

**RESULTS OF CHI-SQUARE TEST**

**Table No 12: Level I Comparison**

Particulars	Level I	Other levels	Row Sum
TCS	31729	286	32015
Infosys	14933	8061	22994
Col Sum	46662	8347	55009

$$x^2 = \frac{N(ad - bc)^2}{(a + b)(c + d)(a + c)(b + d)}$$

Where

- a = 31729 ( TCS, Level I)
- b = 286 (TCS, Other levels)
- c = 14933 ( Infosys, Level I)
- d= 8061 ( Infosys, Other levels)
- N= a+b+c+d = 55009

**1. calculated ad-bc**

$$ad - bc = (31729 \times 8061) - (286 \times 14933) = 255675969 - 4270638 = 251405331$$

**2. Square the result:**

$$(ad - bc)^2 = (251405331)^2 = 6.3194 \times 10^{16}$$

**3. Denominators to be multiplied:**

$$(a + b)(c + d)(a + c)(b + d) = 32015 \times 22994 \times 466628347 \approx 2.865 \times 10^{16}$$

**4. Final chi-square value:**

$$x^2 = \frac{55009 \times (251405331)^2}{(32015)(22994)(46662)(8347)} \approx 12132$$

- ❖ Chi- Square Statistic: 12132
- ❖ P- Value : <0.0000001 ( 2.2e-16)

**Interpretation:** TCS and Infosys differ significantly in their Level I financial disclosures. The 5% significance level results in the rejection of the null hypothesis.

**Fig: 2. R Script Used for Conducting Chi-Square Test (Level I) and Result**

```
> # Level 1
> level1 <- matrix(c(31729, 14933, # Level 1: TCS, Infosys
+ 286, 8061), # Other Levels: TCS (255+31), Infosys (7884+177)
+ nrow = 2, byrow = TRUE)
> colnames(level1) <- c("Level1", "OtherLevels")
> rownames(level1) <- c("TCS", "Infosys")
> cat("Chi-Square Test for Level 1:\n")
Chi-Square Test for Level 1:
> print(level1)
      Level1 OtherLevels
TCS      31729      14933
Infosys   286       8061
> print(chisq.test(level1))

      Pearson's Chi-squared test with Yates' continuity correction

data: level1
X-squared = 12132, df = 1, p-value < 2.2e-16
```

**Table No 13: Level II Comparison**

Particulars	Level II	Other levels	Row Sum
TCS	255	31760	32015
Infosys	7884	15110	22994
Col Sum	8139	46870	55009

$$x^2 = \frac{N(ad - bc)^2}{(a + b)(c + d)(a + c)(b + d)}$$

Where

- a = 255 (TCS, Level II)
- b = 31760 (TCS, Other levels)
- c = 7884 ( Infosys, Level II)
- d= 15110 ( Infosys, Other levels)
- N= a+b+c+d = 55009

**1. calculated ad-bc:**

$$ad - bc = (255 \times 15110) - (31760 \times 7884) = 3853050 - 250179840 = -246326790$$

**2. Square the result:**

$$(ab - bc)^2 = (-246326790)^2 = 6.0657 \times 10^{16}$$

**3. Denominators to be Multiplied :**

$$(a + b)(c + d)(a + c)(b + d) = (32015)(22994)(8139)(46870)$$

$$= 32015 \times 22994 = 736099410$$

$$8139 \times 46870 = 381408930$$

$$\text{Total denominator} = 736099410 \times 381408930 \approx 2.8079 \times 10^{17}$$

**4. Final chi-square value:**

$$x^2 = \frac{55009 \times (246326790)^2}{(32015)(22994)(8139)(46870)}$$

$$x^2 = \frac{55009 \times 6.0657 \times 10^{16}}{2.8079 \times 10^{17}}$$

$$x^2 \approx 11904$$

- ❖ Chi- Square Statistic: 11904
- ❖ P- Value : <0.0000001 ( 2.2e-16)

**Interpretation:** TCS and Infosys differ significantly in their Level II financial disclosures. The 5% significance level results in the rejection of the null hypothesis.

**Fig: 3. R Script Used for Conducting Chi-Square Test (Level II) and Result**

```

> # Level 2
> level2 <- matrix(c(255, 7884, # Level 2: TCS, Infosys
                    31760, 15110), # Other Levels: TCS (31729+31), Infosys (14933+177)
                  nrow = 2, byrow = TRUE)
> colnames(level2) <- c("Level2", "OtherLevels")
> rownames(level2) <- c("TCS", "Infosys")
> cat("\nChi-Square Test for Level 2:\n")

Chi-Square Test for Level 2:
> print(level2)
      Level2 OtherLevels
TCS      255      7884
Infosys 31760     15110
> print(chisq.test(level2))

      Pearson's Chi-squared test with Yates' continuity correction

data:  level2
X-squared = 11904, df = 1, p-value < 2.2e-16
    
```

**Table 14: Level III Comparison**

Particulars	Level III	Other levels	Row Sum
TCS	31	31984	32015
Infosys	177	22817	22994
Col Sum	208	54801	55009

$$x^2 = \frac{N(ad - bc)^2}{(a + b)(c + d)(a + c)(b + d)}$$

Where

- a = 31 (TCS, Level III)
- b = 31984(TCS, Other levels)
- c = 177 ( Infosys, Level III)
- d= 22817( Infosys, Other levels)
- N= a+b+c+d = 55009

**1. calculated ad-bc:**

$$ad - bc = (31 \times 22817) - (31984 \times 177) = 707327 - 5661168 = -4953841$$

**2. Square the result:**

$$(ad - bc)^2 = (-4953841)^2 = 2.4530 \times 10^{13}$$

**3. Denominators to be Multiplied :**

$$(a + b)(c + d)(a + c)(b + d) = (32015)(22994)(208)(54801)$$

**First:**

$$32015 \times 22994 = 736099410$$

$$208 \times 54801 = 11398608$$

**Then:**

$$736099410 \times 11398608 \approx 8.3904 \times 10^{15}$$

**4. Final chi-square value:**

$$x^2 = \frac{55009 \times (4953841)^2}{(32015)(22994)(208)(54801)}$$

$$x^2 = \frac{55009 \times 2.4530 \times 10^{13}}{8.3904 \times 10^{15}}$$

$$x^2 \approx 159.1$$

- ❖ Chi- Square Statistic: 159.10
- ❖ P- Value : <0.0000001 ( 2.2e-16)

**Interpretation:** TCS and Infosys differ significantly in their Level III financial disclosures. The 5% significance level results in the rejection of the null hypothesis.

**Fig. 4. R Script Used for Conducting Chi-Square Test (Level III) and Result**

```
> # Level 3
> level3 <- matrix(c(31, 177, # Level 3: TCS, Infosys
+ 31984, 22817), # Other Levels: TCS (31729+255), Infosys (14933+7884)
+ nrow = 2, byrow = TRUE)
> colnames(level3) <- c("Level13", "OtherLevels")
> rownames(level3) <- c("TCS", "Infosys")
> cat("\nChi-Square Test for Level 3:\n")

Chi-Square Test for Level 3:
> print(level3)
  Level13 OtherLevels
TCS      31         177
Infosys 31984      22817
> print(chisq.test(level3))

Pearson's Chi-squared test with Yates' continuity correction

data: level3
X-squared = 159.1, df = 1, p-value < 2.2e-16
```

Particulars	Objective	Method	Result		P value	Conclusion
			TCS	INFOSYS		
1. Variations in the Quantity of Financial Instruments Reported	To determine whether TCS and Infosys differ substantially in the quantity of financial instruments (FIs) disclosed under each fair value level (Level I, Level II, and Level III).	Using R programming, the Fisher's Exact Test was conducted because of the small sample size and categorical data.	Level I Instruments 5	Level I Instruments 6	0.4003 (Not significant)	The number of financial instruments that TCS and Infosys disclosed does not differ statistically significantly at the 5% significance level between the three fair value levels.
			Level II Instruments 2	Level II Instruments 6	0.6570 (Not significant)	
			Level III Instruments 1	Level III Instruments 3	1.0000 (Not significant)	
2. Variations in the Financial Instruments' Declared Monetary Values	To determine whether there is a significant difference between the two firms' monetary values of FIs disclosed under each fair value level.	Chi-square test of independence, using R programming.	Level I Instruments ₹31,729 Crore	Level I Instruments ₹14,933 Crore	Chi-square: 12132 P-value: < 0.0000001 → Highly significant	The monetary values of financial instruments disclosed by TCS and Infosys under each of the three tiers of the fair value hierarchy differ statistically significantly.
			Level II Instruments ₹255 Crore	Level II Instruments ₹7,884 Crore	Chi-square: 11903 P-value: < 0.0000001 → Highly significant	
			Level III Instruments ₹31 Crore	Level III Instruments ₹177 Crore	Chi-square: 159.10 P-value: < 0.0000001 → Highly significant	

### 1. Recommendations

Particulars	Recommendations
1. Standardization of Valuation Methods	Considerable disparities in monetary disclosures indicate differences in valuation methods. The regulatory organizations responsible for IFRS 13 are encouraged to clarify their compliance requirements to standardize fair value measurement, especially concerning Levels II and III.
2. Enhanced Transparency in Valuation Inputs	Both TCS and Infosys should be requested or required to provide a greater degree of detail regarding the assumptions made, and inputs used for fair value measurements, especially when the financial instruments are categorized under Level II or Level III.
3. Strengthening Qualitative Disclosures	While the number of financial instruments disclosed is similar, companies should improve qualitative aspects such as

	risk sensitivity, valuation rationale, and input reliability to improve stakeholder understanding.
4.Regulatory Monitoring and Compliance	Given the large variances in reported values, regulatorybodies may need to reconsider their disclosure-review processes, as the variance in financial instruments appears to suggest inconsistency in fairvaluationacross similar compliance environments.
5. Encouraging Benchmarking Practices	Firms should benchmark their disclosure practices against industry peers to identify gaps and adopt best practices, improving comparability and investor confidence.
6. Investor Awareness and Education	To help users interpret fair value disclosures better, especially for complex instruments, investor awareness initiatives should be introduced.

## CONCLUSION

The fair value disclosures of Tata Consultancy Services' (TCS) and Infosys Technologies Ltd.'s financial instruments were examined in this study. For each of the three fair value hierarchy levels described under IFRS 13, the emphasis was on the quantity and monetary value of the instruments disclosed.

This study discovered that there is a highly significant difference in monetary value at every level of the hierarchy, even though there is no statistically significant difference in the number of financial instruments disclosed by the two companies.

Both firms' valuation methods and assumptions differ greatly, especially for the Levels (II and III), which rely more on unobservable inputs, according to the findings, which also indicate that both firms satisfy the quantitative read disclosure rules for a variety of financial instruments.

### Data Availability Statement

The data used in this study were obtained from the publicly available annual reports of Infosys Technologies Ltd and Tata Consultancy Services (TCS) for the financial year 2023–24. All financial disclosures, including fair value hierarchy details under Ind AS 113, were extracted from these reports. Processed data tables and analytical computations are available from the corresponding author upon reasonable request.

### Conflict of Interest

The author affirms that there are no conflicts of interest related to the publication of this study.

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