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# IMPACT OF EXCHANGE RATE VOLATILITY ON TAX INCIDENCE FOR INDIAN IT COMPANIES: A COMPARATIVE ANALYSIS

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## ABSTRACT

This study investigates the impact of variations in the USD/INR exchange rate on the tax burden of Indian IT enterprises from 2019 to 2023. Exchange rate fluctuations can affect tax obligations by influencing the conversion of overseas income and the efficacy of hedging tactics. The research conducted an analysis using correlation and regression techniques on data from prominent IT companies like as Infosys, TCS, Wipro, Tech Mahindra, and HCL Technologies. The findings indicate a notable and positive relationship between fluctuations in currency rates and tax expenses. Infosys and TCS demonstrate the highest levels of correlation, with around 82.6% and 88.8% of their variation in tax expenses being accounted for by variations in exchange rates, respectively. These findings emphasize the importance of using efficient risk management methods, such as strategic hedging and the strategic placement of subsidiaries, to reduce the negative impact of currency fluctuations on tax-related financial factors. Further research could investigate the role of government policies in mitigating these risks.

**Keywords:** Exchange Rate Volatility, Tax Incidence, Indian IT Companies, USD/INR, Risk Management, Hedging, Foreign Income, Tax Expense

## 1. INTRODUCTION

Exchange rate volatility, which refers to the unpredictable changes in the value of one currency compared to another, is a significant risk for multinational companies operating in different global economic sectors. This issue holds special significance for Indian Information Technology (IT) enterprises, which significantly depend on global markets and generate substantial income in foreign currencies. These companies encounter a distinct difficulty as changes in the USD/INR exchange rate can directly affect their tax incidence, which refers to the allocation of the tax burden. Although there has been a significant amount of research on the effects of exchange rate volatility on many financial parameters, there has been very little

focus on its specific impact on tax incidence. This study seeks to address this deficiency by conducting a thorough analysis of the relationship between exchange rate volatility and tax incidence across specific Indian IT companies, including prominent industry players such as Infosys and TCS.

This research is of utmost importance as it tackles the distinct issues encountered by the Indian IT sector in a variable exchange rate environment. For example, a sudden increase in the value of the Indian Rupee (INR) can result in reduced actual revenue when measured in INR and therefore decrease tax obligations, whilst a decrease in value may have the opposite impact. Comprehending the correlation between currency fluctuations and tax loads can assist IT organizations in formulating resilient financial plans and implementing risk management methods, thus guaranteeing financial stability and adherence to tax legislation.

## 1.1. STATEMENT OF THE PROBLEM

This study examines the influence of currency rate volatility, particularly the swings in the USD/INR exchange rate, on the tax burden of prominent Indian IT companies. The analysis examines five prominent firms, namely Infosys, Tata Consultancy Services (TCS), Wipro, Tech Mahindra, and HCL Technologies, during a five-year period spanning from 2019 to 2023. Tax incidence refers to the allocation of the tax burden and is evaluated using two primary measures: tax expenditures and effective tax rates.

This study aims to address the following inquiries:

1) How does the volatility of the USD/INR exchange rate affect the tax expenses and effective tax rates of Indian IT firms?
2) What is the varying effect of USD/INR exchange rate volatility on tax incidence among different Indian IT enterprises, and what variables contribute to these variations?

This research focuses on a significant gap in the current literature, which has mostly ignored the precise effect of fluctuations in exchange rates on the distribution of taxes in the IT sector. Comprehending the connection between the Indian IT industry's substantial impact on the country's GDP and its strong dependence on global markets is crucial for both corporate financial management and efficient policy-making.

This study seeks to analyze the impact of exchange rate fluctuations on tax metrics in the IT sector. By utilizing quantitative data and regression analysis, the study aims to offer valuable insights that can enhance financial and risk management practices. Ultimately, this research may contribute to the development of more effective strategies for managing currency-related tax risks in globally-oriented industries.

## 2. REVIEW OF LITERATURE

**Chuanjian Li (2022):** This study investigates the enduring effects of COVID-19 on currency rates, with a specific emphasis on the currencies of China and the USA. The results emphasize that COVID-19 cases and fatalities have a negative impact on exchange rates, indicating long-term economic consequences that extend beyond immediate repercussions.

**Dr. C. KALEESWARI and V. Chinniah (2020):** performed an empirical examination of the fluctuation in exchange rates in India and its correlation with Foreign Direct Investment (FDI). Their study examined a dataset spanning the previous 15 years and employed regression analysis to ascertain the influence of exchange rates on foreign direct investment (FDI) inflows. The results revealed a substantial inverse relationship between the volatility of exchange rates and foreign direct investment (FDI), indicating that greater volatility diminishes investor confidence and the inflow of investments.

**Jérôme Héricourt (2015):** This study investigates the influence of fluctuations in the Real Exchange Rate (RER) on the export performance of Chinese companies, with a particular focus on the fact that firms facing financial limitations are more negatively impacted. The study highlights the significance of strong financial systems in reducing fluctuations in currency rates by using hedging measures.

**YW Cheung (2013):** the author examines the influence of the real effective exchange rate on the export shares of Indian firms. The study reveals that currency appreciation and volatility have a substantial negative impact on export shares. This effect is particularly pronounced for firms with lower export shares and those involved in service exports.

**Nagendran (2012):** the author examined the application of technical analysis as a strategy to mitigate foreign exchange risk in India. The study highlighted the significance of predicting fluctuations in currency rates in order to make well-informed decisions regarding hedging. The study proposed that by examining the fluctuations in exchange rates of prominent currencies, employing a targeted hedging approach according to currency trends can lead to a decrease in expenses and an enhancement in the efficiency of hedging techniques.

**Pahuja, Sehgal, & Sahi (2012):** examined the application of currency futures to mitigate the risks associated with foreign exchange fluctuations. The study emphasized that the opening up of the Indian economy has led to a higher need for risk management tools to protect against changes in currency values. The research revealed that both individual and business investors employ currency derivatives as a means to efficiently control their foreign exchange risks.

**Upadhyaya, Bhandari, and Rainish (2011):** conducted a study to investigate the impact of fluctuations in the real exchange rate on the inflow of foreign direct investment (FDI) in South Asia, specifically focusing on India. Their analysis employed a panel data methodology and discovered that there was no definitive correlation between exchange rate volatility and foreign direct investment (FDI). Nevertheless, many instances have shown that increased fluctuations in exchange rates have been linked to a decrease in foreign direct investment (FDI) inflows

**Kumarasamy (2010):** investigated the causal relationship between the real exchange rate (RER), its volatility, and foreign direct investment (FDI) inflows in India. The study used quarterly data from 1990 to 2008. The study utilized GARCH models to evaluate the volatility of exchange rates and discovered a persistent connection between the Real Effective Exchange Rate (RER), its volatility, and Foreign Direct Investment (FDI). The findings indicated that a decline in currency exchange rates could result in a rise in foreign direct investment (FDI) inflows, while significant fluctuations in exchange rates likely to discourage investment.

## 3. THEORETICAL FRAMEWORK

This study's investigation of the influence of USD/INR exchange rate volatility on tax incidence for Indian IT companies is anchored in two core theoretical concepts: Exchange Rate Exposure Theory and Tax Base Volatility.

### 1) Exchange Rate Exposure Theory

Exchange Rate Exposure Theory proposes that enterprises operating in international markets are exposed to risks stemming from fluctuations in currency exchange rates. For Indian IT companies, who generate a large chunk of their income from global markets (mainly in USD), this risk is particularly crucial.

Key components of this theory related to our investigation include:

- **Transaction Exposure:** Indian IT enterprises sometimes have time gaps between contract signing, service delivery, and payment receipt. During these periods, fluctuations in the USD/INR exchange rate might affect the actual INR value of receivables, thus impacting reported sales and profits.
- **Translation Exposure:** When foreign currency earnings (predominantly in USD) are converted to INR for financial reporting purposes, exchange rate swings can lead to gains or losses. These translation effects can dramatically impact reported profits, which in turn affects tax liability.
- **Economic Exposure:** Long-term fluctuations in exchange rates can affect a company's competitive position in global marketplaces, thereby influencing its overall financial performance and, subsequently, its tax responsibilities.

### 2) Tax Base Volatility

Tax Base Volatility theory proposes that variables creating fluctuations in a company's taxable revenue can contribute to variations in tax liabilities and effective tax rates. In the context of our analysis, currency rate volatility serves as a primary driver of tax base volatility for Indian IT companies.

- Relevant components of this idea include:
- Income Fluctuation: Exchange rate movements can generate considerable volatility in the INR worth of USD-denominated revenues. This immediately affects the tax base (taxable revenue) of IT companies, potentially leading to varying tax liabilities throughout different periods.
- Effective Tax Rate Variability: As the tax base fluctuates due to exchange rate volatility, the effective tax rate (the ratio of tax expense to pre-tax income) may also vary, even if the statutory tax rate remains constant.
- Timing discrepancies: Exchange rate variations can produce timing discrepancies between when income is recognized for accounting reasons and when it's taxable, potentially leading to deferred tax assets or liabilities.

### 3) Integration of Theories

The merger of Exchange Rate Exposure Theory and Tax Base Volatility provides a comprehensive framework for evaluating the relationship between USD/INR exchange rate volatility and tax incidence for Indian IT companies:

- Exchange rate variations immediately effect the INR worth of USD-denominated revenues and earnings (Exchange Rate Exposure).
- These changes generate variations in the tax base (taxable income) of IT companies (Tax Base Volatility).

- Changes in the tax base lead to fluctuations in tax expenses and effective tax rates.
- The degree of damage may vary across organizations dependent on factors such as the proportion of foreign currency income, hedging methods, and the capacity to pass on currency risks to customers.

This theoretical approach supports our premise that increasing USD/INR exchange rate volatility leads to higher fluctuation in tax expenses and effective tax rates for Indian IT enterprises. It also gives a basis for expecting potential variances in the impact among different enterprises within the industry.

By applying this framework, our study aims to quantify and analyze the relationship between exchange rate volatility and tax incidence, providing insights that can inform both corporate financial management strategies and policy considerations in the context of the globally-oriented Indian IT sector.

## 4. METHODOLOGY

This study uses a dataset spanning five years, including tax data from major Indian IT companies listed in the Sensex Index. The data collection process involves:

1) **Selection Criteria:** Companies were chosen based on their market capitalization and relevance in the IT sector.
2) **Data Collection:** Secondary data was sourced from annual reports, financial statements, and reliable financial databases.
3) **Statistical Analysis:** Correlation and regression analyses were conducted to evaluate the relationship between exchange rate volatility (USD/INR) and tax incidence (tax expenses and effective tax rates).

### Data Analysis

**Table 1**

**Table 1 To Assess the Relationship between Exchange Rate Volatility and Tax Incidence**

| | | USDINR | INFY Tax expense | INFY Effective tax rate | WIPRO Tax expense | WIPRO Effective tax rate | TCS Tax expense | TCS Effective tax rate | TECHM Tax expense | TECHM Effective tax rate | HCL Tax expense | HCL Effective tax rate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USDINR | Pearson Correlation | 1 | .909 | .198 | .817 | .109 | .943 | .641 | .632 | .481 | .618 | .083 |
| | Sig. (2-tailed) | | .033 | .75 | .092 | .861 | .016 | .243 | .253 | .412 | .266 | .894 |
| | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| INFY Tax expense | Pearson Correlation | 0.909 | 1 | .567 | .944 | .282 | .988 | .885 | .801 | .795 | .743 | .270 |
| | Sig. (2-tailed) | .033 | | .319 | .016 | .646 | .002 | .046 | .104 | .108 | .15 | .66 |
| | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| INFY Effective tax rate | Pearson Correlation | 0.198 | 0.567 | 1 | .648 | .687 | .475 | .728 | .458 | .856 | .526 | .434 |
| | Sig. (2-tailed) | .75 | .319 | | .237 | .2 | .419 | .163 | .438 | .064 | .363 | .465 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| WIPRO Tax expense | Pearson Correlation | .817 | .944 | .648 | 1 | .496 | .887 | .87 | .698 | .833 | .906 | .543 |
| | Sig. (2-tailed) | .092 | .016 | 0.237 | | .395 | .045 | .055 | .19 | .08 | .034 | .344 |
| | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| WIPRO Effective tax rate | Pearson Correlation | 0.109 | 0.282 | 0.687 | 0.496 | 1 | .194 | .219 | -.166 | .375 | .469 | .454 |
| | Sig. (2-tailed) | .861 | .646 | .2 | .395 | | .755 | .723 | .789 | .534 | .425 | .442 |
| | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| TCS Tax expense | Pearson Correlation | .943 | .988 | .475 | .887 | .194 | 1 | .825 | .777 | .709 | .644 | .125 |
| | Sig. (2-tailed) | .016 | .002 | .419 | .045 | .755 | | .085 | .122 | .18 | .241 | .841 |
| | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| TCS Effective tax rate | Pearson Correlation | .641 | .885 | .728 | .87 | .219 | .825 | 1 | .925 | .97 | .768 | .479 |
| | Sig. (2-tailed) | .243 | .046 | .163 | .055 | .723 | .085 | | .024 | .006 | .13 | .414 |
| | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| TECHM Tax expense | Pearson Correlation | .632 | .801 | .458 | .698 | -.166 | .777 | .925 | 1 | .828 | .599 | .297 |
| | Sig. (2-tailed) | .253 | .104 | .438 | .19 | .789 | .122 | .024 | | .083 | .286 | .627 |
| | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| TECHM Effective tax rate | Pearson Correlation | .481 | .795 | .856 | .833 | .375 | .709 | .97 | .828 | 1 | .76 | .567 |
| | Sig. (2-tailed) | .412 | .108 | .064 | .08 | .534 | .18 | .006 | .083 | | .136 | .318 |
| | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| HCL Tax expense | Pearson Correlation | .618 | .743 | .526 | .906 | .469 | .644 | .768 | .599 | .76 | 1 | .83 |
| | Sig. (2-tailed) | .266 | .15 | .363 | .034 | .425 | .241 | .13 | .286 | .136 | | .082 |
| | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| HCL Effective tax rate | Pearson Correlation | .083 | .27 | .434 | .543 | .454 | .125 | .479 | .297 | .567 | .83 | 1 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sig. (2-tailed) | .894 | .66 | .465 | .344 | .442 | .841 | .414 | .627 | .318 | .082 | |
| N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |

**1) Infosys (INFY)**

- **USD/INR and INFY Tax Expense (0.909, p = 0.033):**

There is a strong positive correlation between USD/INR exchange rate volatility and Infosys' tax expense, which is statistically significant. This suggests that as the USD/INR exchange rate increases (INR depreciates), Infosys' tax expense tends to increase.

USD/INR and INFY Effective Tax Rate (0.198, p = 0.750):

There is a weak positive correlation, which is not statistically significant. This indicates that changes in the exchange rate have little to no consistent impact on Infosys' effective tax rate.

**2) Wipro**

- **USD/INR and Wipro Tax Expense (0.817, p = 0.092):**

There is a strong positive correlation between USD/INR and Wipro's tax expense, but this relationship is not statistically significant at the 0.05 level. This suggests that while there may be a relationship, it is not strong enough to be considered significant with this sample.

USD/INR and Wipro Effective Tax Rate (0.109, p = 0.861):

A very weak positive correlation that is not statistically significant, indicating little to no relationship between exchange rate changes and Wipro's effective tax rate.

**3) Tata Consultancy Services (TCS)**

**USD/INR and TCS Tax Expense (0.943, p = 0.016):**

There is a very strong positive correlation between USD/INR and TCS's tax expense, which is statistically significant. This indicates that fluctuations in the exchange rate are strongly associated with changes in TCS's tax expenses.

USD/INR and TCS Effective Tax Rate (0.641, p = 0.243):

There is a moderate positive correlation, but it is not statistically significant. This suggests a potential relationship between exchange rate volatility and TCS's effective tax rate, but this relationship is not strong enough to be significant.

**4) Tech Mahindra (TECHM)**

**USD/INR and TECHM Tax Expense (0.632, p = 0.253):**

There is a moderate positive correlation, but it is not statistically significant, suggesting a possible relationship that is not conclusive with this data.

**USD/INR and TECHM Effective Tax Rate (0.481, p = 0.412):**

A moderate positive correlation exists but is not statistically significant, indicating a weak and uncertain relationship between the exchange rate and the effective tax rate.

**5) HCL Technologies (HCL)**

USD/INR and HCL Tax Expense (0.618, p = 0.266):

There is a moderate positive correlation between the exchange rate and HCL's tax expense, but this relationship is not statistically significant.

**USD/INR and HCL Effective Tax Rate (0.083, p = 0.894):**

There is a very weak and non-significant positive correlation, indicating virtually no relationship between the exchange rate and HCL's effective tax rate.

**Table 2**

| Table 2 Model Summary | | | | |
|---|---|---|---|---|
| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** |
| 1 | .909[a] | 0.826 | 0.768 | 687.85314 |

a) **Predictors:** Constant, USDINR

**Table 3**

| Table 3 Coefficients[a] | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | | **Unstandardized Coefficients** | | **Standardized Coefficients** | **t** | **Sig.** |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | -1307.521 | 1981.641 | | -0.66 | 0.557 |
| | USDINR | 36.799 | 26.074 | 0.632 | 1.411 | 0.253 |

a) **Dependent Variable** TechM_Tax_expense

The results of the regression study indicate a robust, positive, and statistically significant correlation between the exchange rate of USD/INR and the tax expense of Infosys. As the exchange rate between USD and INR rises (i.e., as the rupee is devalued against the dollar), Infosys' tax expenditure tends to rise significantly. This model accounts for a significant proportion (82.6%) of the variability in Infosys' tax expense, indicating that changes in exchange rates have a dominant role in determining the company's tax obligations.

This result is consistent with the Exchange Rate Exposure Theory and the concept of Tax Base Volatility which were examined in the theoretical framework. Indications point to Infosys being very vulnerable to fluctuations in currency exchange rates, resulting in instability in its tax liabilities. The robust correlation may be attributed to the fact that a significant proportion of Infosys' revenue is denominated in USD, therefore rendering its taxable income in INR very responsive to fluctuations in exchange rates.

**WIPRO**

**Table 4**

| Table 4 Model Summary | | | | |
|---|---|---|---|---|
| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** |
| 1 | .817[a] | .667 | .556 | 253.68594 |
| **Predictors** (Constant), USDINR | | | | |

**Table 5**

| Table 5 Coefficients[a] | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | | **Unstandardized Coefficients** | | **Standardized Coefficients** | **t** | **Sig.** |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | -2183.679 | 2064.385 | | -1.058 | .368 |
| | USDINR | 66.559 | 27.163 | .817 | 2.450 | .092 |

**Dependent Variable** Wipro_tax_expense

The results of the regression study indicate a robust positive correlation between the exchange rate of USD/INR and Wipro's tax expenditure. When the USD/INR exchange rate rises (i.e., when the rupee weakens against the dollar), Wipro's tax obligations typically rise as well. This analytical framework accounts for a significant proportion (66.7%) of the variability in Wipro's tax expenditure, indicating that changes in exchange rates play a crucial role in determining the company's tax obligations.

Nevertheless, it is important to acknowledge that this correlation lacks statistical significance at the standard 5% level (but it does at the 10% one). This may be attributed to the limited sample size (N=5), which constrains the statistical test's power.

The results remain consistent with the Exchange Rate Exposure Theory and Tax Base Volatility idea, suggesting that Wipro is significantly exposed to the risk of fluctuations in exchange rates, which impacts its tax liabilities. The strong correlation implies that a substantial proportion of Wipro's income may be denominated in USD, therefore rendering its taxable income in INR more susceptible to fluctuations in exchange rates.

**TCS**

**Table 6**

**Table 6 Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .943[a] | .888 | .851 | 807.62298 |

**Predictors** (Constant), USDINR

**Table 7**

**Table 7 Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | -20286.052 | 6572.081 | | -3.087 | .054 |
| | USDINR | 422.403 | 86.474 | .943 | 4.885 | .016 |

**Dependent Variable** TCS_Tax_expense

The results of the regression analysis demonstrate a robust and statistically significant positive correlation between the exchange rate of USD/INR and the tax expenses of TCS. Particularly, when the Indian Rupee weakens compared to the United States Dollar, TCS's tax costs rise substantially. The model elucidates a significant proportion of the variability in tax expenditures (88.8%), indicating that changes in exchange rates have a crucial role in predicting TCS's tax liability.

Statistically significant findings suggest that TCS should diligently track fluctuations in exchange rates as a component of its financial planning and risk management methodologies. Considering the significant correlation, TCS should contemplate implementing hedging techniques or alternative financial instruments to effectively reduce the influence of fluctuations in currency rates on its tax expenditures. This discovery has significant relevance for TCS, as it participates

substantially in global markets and so faces greater vulnerability to changes in exchange rates.

### Tech Mahindra

**Tale 8**

**Table 8 Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .632[a] | 0.888 | .399 | 243.51784 |

**Predictors** (Constant), USDINR

**Table 9**

**Table 9 Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | -1307.521 | 1981.641 | | -.660 | .557 |
| | USDINR | 36.799 | 26.074 | .632 | 1.411 | .253 |

**Dependent Variable** TechM_Tax_expense

The results of the regression analysis indicate a moderate positive correlation between the USD/INR exchange rate and Tech Mahindra's tax expenses. However, this correlation does not reach statistical significance at the standard threshold of 0.05. The model accounts for almost 39.9% of the variability in tax expenses, suggesting that supplementary variables may also exert a substantial influence on Tech Mahindra's tax liability.

In light of the absence of statistical significance, it is probable that the USD/INR exchange rate does not possess robust or reliable predictive power for tax expenditures for Tech Mahindra. This implies that the corporation may exhibit a lower degree of sensitiveness towards changes in exchange rates in comparison to other companies such as Infosys or TCS. Nevertheless, Tech Mahindra should continue to closely observe fluctuations in exchange rates as a component of its comprehensive financial plan, while also taking into account further elements that could impact its tax costs.

This discovery suggests that although exchange rates do affect Tech Mahindra's tax expenses to some extent, the correlation is not sufficiently robust to justify substantial adjustments in financial strategy only relying on exchange rate fluctuations. Additional research using a bigger sample size or incorporating more variables could yield more profound understanding of the elements that impact Tech Mahindra's tax expenditures.

### HCL Ltd

**Table 10**

**Table 10 Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .618[a] | 0.382 | .176 | 901.99904 |

**Predictors** (Constant), USDINR

**Table 11**

**Table 11 Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | -6345.630 | 7340.072 | | -.865 | .451 |
| | USDINR | 131.535 | 96.579 | .618 | 1.362 | .266 |

**Dependent Variable** HCl_tax_expense

The regression analysis indicates a moderate positive correlation between the USD/INR exchange rate and HCL Ltd's tax expenses. However, this correlation does not prove statistically significant at the standard significance level of 0.05. With around 38.2% of the fluctuation in tax expenses explained by the model, it suggests that additional variables, beyond the exchange rate, are likely affecting HCL Ltd's tax expenses.

Based on the absence of statistical significance, it implies that although the USD/INR exchange rate may impact HCL Ltd's tax expenses, the correlation is not sufficiently robust or constant to be regarded a dependable predictor. Therefore, it seems that HCL Ltd may not have to give priority to fluctuations in exchange rates as a main consideration in its tax planning and financial strategy. Nevertheless, it is crucial to closely observe fluctuations in currency rates as a component of a comprehensive strategy for managing financial risks, taking into account the little but possible influence on tax costs.

In summary, the results suggest that fluctuations in exchange rates have an impact on the tax costs of HCL Ltd, although it is not the primary determinant. Additional study using a bigger sample size or incorporating more variables may provide clearer insights into the elements that have a more substantial impact on the company's tax expenditures.

## 5. DISCUSSION

This study's findings provide significant insights into the correlation between exchange rate volatility and tax incidence for prominent Indian IT firms. The research examines the impact of currency changes on tax liabilities and the variation in this impact among five major firms: Infosys, TCS, Wipro, Tech Mahindra, and HCL Technologies. Presented below are the findings analysed within the larger theoretical framework and their practical consequences for the sector.

### 1) The Influence of Exchange Rate Volatility on Tax Expenditures

The study revealed that the tax expenses of Indian IT companies are significantly impacted by exchange rate volatility, namely the oscillations in the USD/INR exchange rate. Strength and significance of this effect differ among the companies examined:

- **Infosys and TCS:** Both firms demonstrate a robust and statistically significance positive relationship between the exchange rate of USD/INR and their tax expenditures. According to the regression analysis, a significant proportion of the variation in tax expenses for these companies (82.6% for Infosys and 88.8% for TCS) may be explained by volatility in currency rates. This implies that these corporations, actively engaged in global markets and generating substantial income in USD, are especially susceptible to changes in currency exchange rates. The robust correlation

could be attributed to the significant share of revenue denominated in USD, which makes their taxable income in INR very responsive to fluctuations in exchange rates.

- **Wipro:** While Wipro does exhibit a robust positive link between exchange rate volatility and tax incurred, this association lacks statistical significance at the 5% level. This phenomenon may be attributed to the limited sample size or other variables that were not included in this analysis. Nevertheless, the link suggests that change in exchange rates probably have a substantial impact on Wipro's tax expenditures, albeit the statistical evidence is not as strong as that of Infosys and TCS.
- **Tech Mahindra and HCL Technologies:** A comparison between Tech Mahindra and HCL Technologies. These firms have modest positive associations between the USD/INR exchange rate and tax expenditures; however, these associations lack statistical significance. This implies that although changes in exchange rates do affect their tax obligations to some extent, other variables may own greater influence. A lesser connection could suggest that these companies are either less vulnerable to currency risk or have more efficient hedging measures in control.

### 2) Variability in Effective Tax Rates

The study further investigated the influence of fluctuations in exchange rates on the effective tax rates of these corporations. Across all firms, the data indicate lower and generally non-significant relationships between exchange rate movements and effective tax rates.

Despite the robust association between exchange rate volatility and tax expenses, the correlation between exchange rates and effective tax rates is feeble and lacks statistical significance for Infosys and TCS. This observation implies that although currency fluctuations have an impact on the total amount of tax paid, they do not guarantee substantial alterations in the effective tax rate. This could be attributed to the presence of stable profit margins or the use of tax planning principles that minimize the influence of exchange rate fluctuations.

Tech Mahindra, Wipro, and HCL Technologies: Similarly, these firms demonstrate lackluster and statistically insignificant associations between fluctuations in exchange rates and effective tax rates. This observation suggests that fluctuations in the exchange rate may not have a substantial impact on the percentage of income that is subject to taxation. This further reinforces the notion that other variables, such as profit margins or tax deductions, may have a greater influence on the determination of effective tax rates.

### 3) Theoretical Implications

The conclusions of this study are consistent with the principles of the Exchange Rate Exposure Theory and the notion of Tax Base Volatility.

Exchange Rate Exposure Theory suggests that firms which operate in global markets face risks arising from changes in currency exchange rates, which can impact both their income and tax obligations. The validity of this hypothesis is substantiated by the notable correlations witnessed in Infosys and TCS, where substantial proportions of revenue are expressed in USD, rendering these firms very responsive to fluctuations in the currency rate.

Tax base volatility refers to the phenomenon where changes in taxable income, caused by variables like exchange rate swings, can result in variations in tax obligations and effective tax rates. The figures of the study provide partial confirmation of this hypothesis, as the tax expenditures of the examined companies

are indeed influenced by fluctuations in exchange rates. Nevertheless, the effect on effective tax rates is rather insignificant, indicating that although currency changes affect the taxable base, firms may have established systems to maintain fixed effective tax rates.

**4) Practical Implications**

The relevance of these findings has substantial practical consequences for financial managers and policymakers operating inside the Indian IT industry.

Organisations, especially those heavily reliant on global markets, should adopt strong risk management measures to minimise the effects of fluctuations in currency rates on their tax obligations. One potential strategy is to employ hedging products, such as currency forwards or options, to secure fixed exchange rates and minimize uncertainty in tax planning.

Considering the variety in the effect of exchange rate changes on tax expenses, firms should contemplate implementing dynamic tax planning solutions that can adjust to evolving currency conditions. This may entail the careful adjustment of income recognition timing, efficient utilization of tax credits or deductions, and strategic management of subsidiary sites to exploit advantageous tax countries.

Policymakers should be cognizant of the real consequences of fluctuations in exchange rates on the tax obligations of crucial industries such as information technology. Consideration should be given to policies that offer enhanced stability or predictability in tax liabilities for firms operating in currency settings characterized by considerable volatility. Furthermore, government-backed hedging systems or incentives for firms to enhance their currency risk management capacity may also play a significant impact.

**5) Limitations and Areas for Future Research**

Although this research offers invaluable insights, it is crucial to recognize its constraints:

- **Sample Size:** The analysis was carried out using a quite modest sample size (N=5), which could restrict the applicability of the results. Subsequent investigations may enhance the sample size by incorporating additional firms or extending the time frame to accurately verify the findings.
- **Other Influencing Factors:** The study mainly examined the impact of exchange rate volatility on tax expenditures. Nevertheless, additional variables, such as alterations in tax legislation, economic circumstances, or company-specific actions, may also exert a substantial influence. To enhance the comprehensiveness of the understanding of the determinants of tax incidence in the IT sector, future study should investigate these supplementary aspects.
- **Heterogeneity Among Companies:** The observed variations among companies such as Infosys, TCS, and Wipro indicate a substantial diversity in the impact of exchange rate volatility on individual organizations. Additional investigation could examine the factors contributing to these disparities, such as divergences in business models, degrees of global exposure, or efficacy of risk management techniques.

## 6. CONCLUSION

This research emphasizes the substantial influence of fluctuations in exchange rates on the tax costs incurred by Indian IT firms, especially those that have a large degree of overseas operations. The results emphasise the need of competent risk management and flexible tax planning in reducing the financial risks linked to currency volatility. Despite the relatively minor effect on effective tax rates, the general correlation between exchange rate volatility and tax incidence offers valuable insights for both corporate managers and policymakers. Exploring this topic further could enhance the precision of these approaches and bolster the ability of the Indian IT industry to withstand global economic shocks.

## CONFLICT OF INTERESTS

None.

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## REFERENCES

Li, C., Su, Z. W., Yaqoob, T., & Sajid, Y. (2022). COVID-19 and currency market: a comparative analysis of exchange rate movement in China and USA during pandemic. Economic research-Ekonomska istraživanja, 35(1), 2477-2492.

Chinniah, D. (2020). An empirical analysis of volatility of foreign exchange rates in india and its relationship with foreign direct investment. Journal of emerging technologies and innovative research.

Héricourt, J., & Poncet, S. (2015). Exchange rate volatility, financial constraints, and trade: Empirical evidence from Chinese firms. *The World Bank Economic Review*, *29*(3), 550-578.

Cheung, Y. W., & Sengupta, R. (2013). Impact of exchange rate movements on exports: An analysis of Indian non-financial sector firms. Journal of International Money and Finance, 39, 231-245.

Nagendran, R. (2012). A study on Foreign Exchange Rate Volatility in India and Use of Technical Analysis in Hedging the Exposure. *Journal of Contemporary Research in Management*, 3.

Pahuja, A., Sehgal, N., & Sahi, A. (2012). Hedging Foreign Exchange Risks with Currency Derivatives. *Risk Management eJournal*.

Upadhyaya, K., Bhandari, R., & Rainish, R. (2011). Exchange rate volatility and Foreign Direct Investment in South Asia. *International Journal of Economic Policy in Emerging Economies*, 4, 366-377. https://doi.org/10.1504/IJEPEE.2011.043310.

Kumarasamy, D. (2010). Foreign Direct Investment and Exchange Rate in India. *Comparative Political Economy: Monetary Policy eJournal*.

https://www.ofx.com/en-au/forex-news/historical-exchange-rates/yearly-average-rates/

https://www.tcs.com/

https://www.infosys.com/

https://www.wipro.com/

https://www.techmahindra.com/en-in/

https://www.hcltech.com/