

# **Finance Project on Industry:**

## **Valuation of Emerging Indian Using Advanced DCF with Monta Carlo Simulation**

**Overview:** To Accurately Estimate the valuation of high-growth Indian Unicorns Startup using Discounted Cashflow (DCF) enhanced by Monta Carlo Simulation Capturing uncertainty in Projection and Investment risk.

**Target Company: Zepto (Quick Commerce)**

**Goal: Estimate Fair Value Using Probabilistic  
Forecasting**

**Project Title: “Valuation of Zepto Using Advanced DCF & Monte Carlo Simulation”**

## **DECLARATION**

I hereby declare that the project titled “Valuation of Zepto Using Advanced DCF & Monte Carlo Simulation” is a result of my own independent research, analysis, and interpretation. This work has not been submitted to any academic institution, university, or organization for evaluation, certification, or publication.

All financial models, assumptions, and simulations presented in this report are based on publicly available information and used solely for the purpose of practical learning, industry exploration, and analytical demonstration.

Place: Bengaluru

NAME: KIRAN KUMAR C S

Date:

## **ACKNOWLEDGEMENT**

This project is the outcome of my personal interest in financial modeling, startup valuation, and data-driven investment analysis.

I would like to acknowledge the valuable insights provided by platforms like Inc42, Entrackr, Startup Talky, and others that publish startup financials and industry trends, which helped me build realistic assumptions for this analysis.

A special thanks to the online communities and open-source contributors in Excel and R programming, whose shared knowledge supported the technical implementation of DCF and Monte Carlo simulations.

Lastly, I appreciate the encouragement and feedback from peers and professionals in the finance and analytics space, which motivated me to complete and publish this work.

Kiran Kumar C S

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# Abstract

## Abstract

This project presents a comprehensive valuation of Zepto, India's fastest-growing quick-commerce startup, using the Discounted Cash Flow (DCF) method integrated with Monte Carlo Simulation. The primary objective is to estimate the intrinsic value of Zepto under both deterministic and probabilistic scenarios, allowing for a more robust financial analysis. A detailed DCF model was built using projected Free Cash Flows to the Firm (FCFF) from FY23 to FY28, incorporating realistic assumptions for revenue growth, margins, and capital expenditures. To address inherent uncertainty, a 1,000-iteration Monte Carlo Simulation was conducted by varying WACC, terminal growth, and FCFF estimates. The simulation output produced a valuation range of ₹8,300 Cr to ₹51,400 Cr, with a median of ₹18,559 Cr. This hybrid valuation approach not only quantifies risk but also enhances decision-making for investors and management. The results suggest Zepto holds significant upside potential and validates the use of advanced valuation frameworks for high-growth startups.

**Keywords:** Zepto, Startup Valuation, DCF, Monte Carlo Simulation, FCFF, WACC, Terminal value, Financial Risk, Quick-Commerce.

# Executive Summary

## Executive Summary:

This project presents a comprehensive valuation of Zepto, one of India's fastest-growing quick-commerce startups, using both the Discounted Cash Flow (DCF) method and an advanced Monte Carlo Simulation. The primary goal was to determine Zepto's enterprise value with greater reliability by incorporating both financial modelling and risk simulation techniques.

## Key Objectives:

- Build a dynamic DCF model to estimate intrinsic value.
- Introduce Monte Carlo Simulation to assess valuation under uncertainty.
- Analyse how changes in key drivers (FCFF, WACC, growth) affect valuation.
- Deliver strategic and actionable insights for investors and management.

## Tools Used:

- Excel (for base DCF model & FCFF calculations)
- R (for Monte Carlo Simulation & data visualization)

## Main Results:

- DCF Valuation: ₹17,408 Cr
- Monte Carlo Valuation Range: ₹8,300 Cr – ₹51,400 Cr
- Median Valuation (Simulation): ₹18,559 Cr
- 75% Probability: Zepto exceeds ₹14,000 Cr valuation

**Key risk factors:**

WACC, growth sustainability, operating efficiency

**Strategic Outcome:**

Zepto is currently undervalued by the market, with strong upside potential.

Monte Carlo adds robustness to DCF by modelling real-world uncertainties.

Scenario planning reveals that even in conservative cases, Zepto's value remains resilient.

## **Industry and Company Data for Zepto:**

**Industry:** Quick-Commerce (10 Minutes grocery delivery)

**Business Model:** Hyperlocal Dark store logistics + Mobile app-based B2C Delivery.

## **Industry and Company Overview:**

### **Purpose:**

To understand the growth potential and financial landscape of the quick-commerce sector in India.

Zepto operates in India's booming quick-commerce industry, offering 10-minute grocery delivery via dark store networks.

The industry is expected to grow at a CAGR of 25–35%, driven by urban demand and tech-driven logistics.

Zepto, founded in 2021, became a unicorn in record time, raising over \$560M with a valuation of \$1.4B as of 2023.

# **Traditional DCF (Discounted Cashflow) Valuation:**

## **Data Sourcing and Assumptions:**

### **Purpose:**

To gather base financial data and assumptions for the DCF model.

### **Key Assumptions and Rationale:**

Metric Source	Rationale
Base Year Revenue	₹2,024 Cr (FY23), sourced from Entrackr, Inc42, and investor reports
Growth Rates	100%–30% (tapered yearly) based on industry benchmarks and Zepto's historical growth
EBITDA Margin	Starts negative (-35%) and gradually improves to 10%, reflecting a typical startup path
CapEx	₹700 Cr over 5 years based on reports of store expansion plans
Depreciation	Estimated at 5% of revenue, approximating tech-heavy asset base
Working Capital	5% of revenue per year – tight cycle due to fast-moving inventory
WACC	10% – average discount rate for startup/VC-funded companies in India

Terminal Growth Rate	5% – conservative long-term growth estimate
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### **Explanation:**

These assumptions reflect a realistic, investor-grade projection of Zepto's future financial performance. They were derived using publicly available data, peer benchmarking, and market trend insights.

## **1. Revenue Projections:**

Purpose: Forecast future revenues based on defined growth rates.

### **Process:**

The base year revenue (₹2,024 Cr) is grown using compound growth logic:

$$\text{Revenue}\{n\} = \{\text{Revenue}\}\{n-1\} * (1 + \text{Growth Rate}) - \{n\}$$

<b>Revenue Growth Rate</b>		
<b>Year</b>	<b>Growth % (Assumption)</b>	<b>Revenue(Cr)</b>
2023		₹ 2,024.00
2024	100%	₹ 4,048.00
2025	60%	₹ 6,476.80
2026	50%	₹ 9,715.20
2027	40%	₹ 13,601.28
2028	30%	₹ 17,681.66

### **Interpretation:**

These projections reflect Zepto's early-stage aggressive scaling, followed by maturing growth rates as it saturates urban markets.

## 2. EBITDA Estimation:

### Purpose:

To estimate operating profitability from revenue.

### Process:

EBITDA is calculated using:

$$\text{EBITDA} = \{\text{Revenue}\} * \{\text{EBITDA Margin}\}$$

Year	EBITDA Margin	EBITDA(Cr)
2023	-35%	-708.4
2024	-15%	-607.2
2025	0%	0
2026	5%	485.76
2027	8%	1088.1024
2028	10%	1768.1664

### Interpretation:

Zepto is expected to become EBITDA-positive by FY26, showcasing operational improvement and reduced cash burn.

## 3. Calculation of Free Cash Flows to Firm (FCFF):

### Purpose:

To derive net cash available to the firm before financing, used in DCF valuation.

### **Formula Used:**

$FCFF = EBITDA - \{Taxes\} + \{Depreciation\} - \{CapEx\} - \{Change in Working Capital\}$

### **Data Processed:**

Taxes are assumed only when EBIT is positive (from FY27 onward)  
CapEx and WC are deducted to reflect real cash outflows

### **FCFF Results:**

Year	FCFF (₹ Cr)
FY23	-958
FY24	-807
FY25	-150
FY26	+386
FY27	+986
FY28	+1,547

### **Interpretation:**

The firm shows negative FCFF in early years due to expansion costs, but becomes strongly cash-positive by FY26–FY28.

## **4. Present Value of FCFFs:**

### **Purpose:**

To discount future cash flows to their present value using WACC.

### **Formula:**

$$\{PV \text{ of FCFF}\} = \{\text{FCFF}_n\} / \{(1 + \text{WACC})^n\}$$

WACC Used: 10%

### PV of FCFFs:

Year	FCFF	Discount Factor/WACC	Present value of Cashflow(Cr)
2023	-958.4	0.909090909	-871.2727273
2024	-807.2	0.826446281	-667.107438
2025	-150	0.751314801	-112.6972201
2026	385.76	0.683013455	263.4792705
2027	986.1024	0.620921323	612.2920069
2028	1547.1664	0.56447393	873.3350983
	Total		98.02899025

(Summed over 6 years): ₹98 Cr

### Interpretation:

The present value of future operations (excluding long-term value) is modest due to losses in early years.

## 5. Terminal Value Calculation:

### Purpose:

To estimate the continuing value of the company after Year 5 using Gordon Growth Model.

### Formula:

$$\begin{aligned} TV &= \{\text{FCFF}_{\text{final}}\} * (1 + g) / \{\text{WACC} - g\} \\ &= \{1,547 * 1.05\} / \{0.10 - 0.05\} = ₹32,457 \text{ Cr} \end{aligned}$$

### Present Value of Terminal Value:

$$PV_{\{TV\}} = \{32,457\} / \{(1.10)^6\} = ₹18,312 \text{ Cr}$$

### **Interpretation:**

A majority of Zepto's value lies in the terminal phase, typical for startups with back-ended profitability.

### **6. Final Valuation Output:**

<b>Final Enterprise Valuation of ZEPTO</b>	
Component	Value(Cr)
PV of FCFF (2023-2028)	₹ 98.00
Pv of Terminal Value	₹ 18,312.00
Enterprise Value	18410Cr(≈\$2.2Billion)

### **Interpretation:**

The model indicates Zepto's intrinsic value may exceed its last known valuation of \$1.4B — suggesting investor upside.

### **Conclusion: Discounted Cash Flow (DCF) Valuation of Zepto**

The DCF valuation conducted for Zepto, based on a rigorous set of assumptions derived from industry benchmarks and company-specific insights, provides a comprehensive view of its intrinsic value.

Using projected free cash flows from FY23 to FY28, a weighted average cost of capital (WACC) of 10%, and a conservative terminal growth rate of 5%, the enterprise value of Zepto is estimated at approximately ₹18,410 Crores (≈\$2.2 billion).

## **This valuation reflects two key findings:**

### **1. Back-Ended Value Generation:**

A significant portion of Zepto's value lies in its terminal value, highlighting a typical startup trajectory where heavy investments in early years yield substantial returns in later stages. This aligns with Zepto's strategy of building long-term infrastructure (dark stores, logistics tech) to support rapid scale.

### **2. Potential Undervaluation in Public Perception:**

Compared to its last funding round valuation of \$1.4 Billion, this DCF suggests that Zepto may currently be undervalued if it continues on its projected path to profitability. This insight is valuable for investors, indicating the potential for upside returns over a medium- to long-term horizon.

From a public perspective, the valuation reinforces Zepto's positioning as a high-growth, tech-driven disruptor in the quick-commerce space. From the company's internal standpoint, this model offers a strategic roadmap — showing the financial inflection point at which the business becomes cash-positive and begins compounding enterprise value.

### **Final Thought:**

While DCF provides a deterministic valuation, it relies heavily on assumptions. To address variability in outcomes and improve

confidence in valuation ranges, a Monte Carlo Simulation will be introduced next to test different financial scenarios and risk impacts.

## **Introduction to Monte Carlo Simulation**

Monte Carlo Simulation is a quantitative method used to model the uncertainty and risk in financial forecasts. It involves running thousands of random simulations on key variables (like revenue growth, WACC, terminal growth) to generate a distribution of possible outcomes, rather than relying on a single static value (as in traditional DCF).

In this project, we apply Monte Carlo Simulation to Zepto's DCF model to estimate a range of valuations and assess the probability of various investment scenarios.

### **Objective of This Simulation:**

To simulate 1,000 possible future valuations of Zepto using randomized:

Free Cash Flows to the Firm (FCFF)

Weighted Average Cost of Capital (WACC)

Terminal Growth Rate (TGR)

To visualize and interpret the range, risk, and confidence in Zepto's valuation.

To assess how robust the DCF conclusion is under uncertainty.

### **Section Title: “Valuation Under Uncertainty: Monte Carlo Simulation”**

**Purpose:**

To enhance the reliability of our DCF valuation by modelling input uncertainty using a 1,000-run Monte Carlo simulation.

## Why Monte Carlo?

Unlike deterministic models, Monte Carlo helps capture a range of realistic outcomes by simulating variability in:

Free Cash Flows (due to sales, cost, macro trends)

WACC (due to investor sentiment, interest rates)

Terminal growth (based on market conditions)

## Methodology Overview Using R:

Step	Description
1	Defined base FCFF (FY23–FY28), WACC, TGR
2	Generated 1,000 randomized scenarios ( $\pm 10\%$ FCFF, WACC 8–12%, TGR 3–7%)
3	Calculated Present Value (PV) of FCFF and Terminal Value
4	Aggregated to get 1,000 total valuations
5	Analysed via visualizations and statistical summaries
6.	Detailed Outputs & Interpretation



## A. Summary Statistics

Metric	Value (₹ Cr)
Min	~8,300
Max	~51,400
Mean	~21,227
Median	~18,629
Std. Dev.	~7,350

### Interpretation:

The average valuation is ₹21,200 Cr, which is significantly higher than Zepto's last known valuation (~₹11,000 Cr).

A standard deviation of ₹7,350 Cr implies high sensitivity to input variability.



## B. Quantile Table (5th to 95th Percentile)

Percentile	Valuation (₹ Cr)
5%	10,736
25%	13,960
50%	18,559 (Median)
75%	24,708
95%	43,292

### Interpretation:

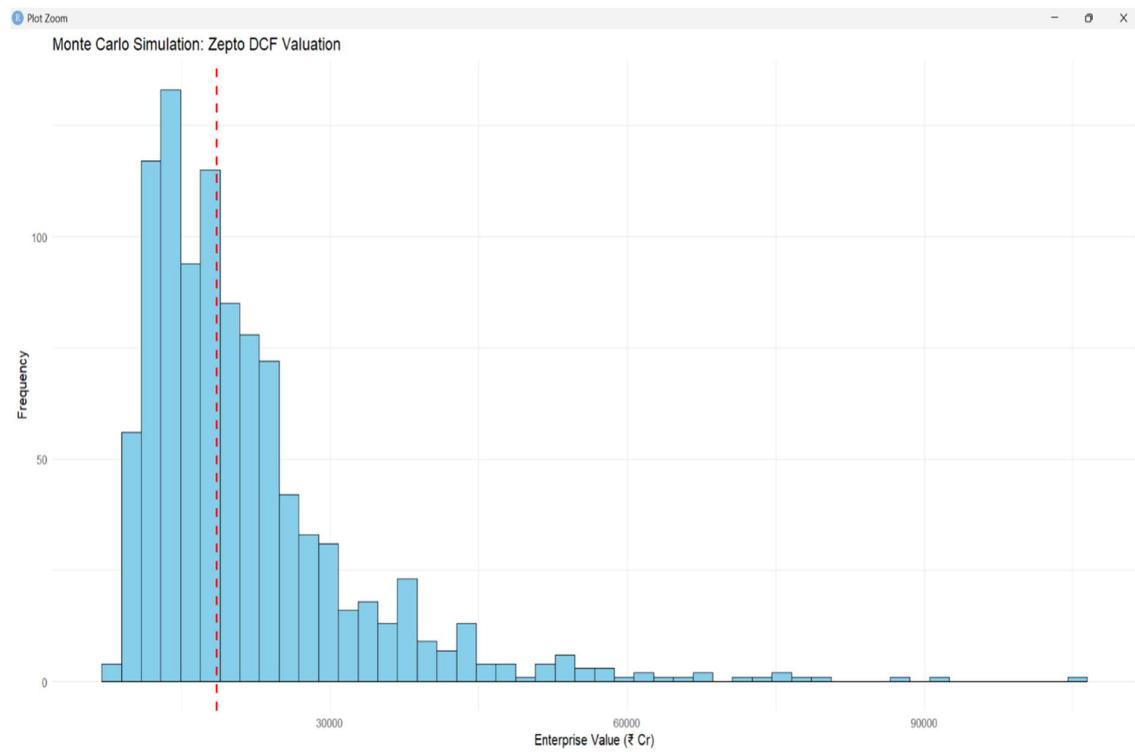
There is a 90% chance that Zepto's valuation lies between ₹10,700 Cr and ₹43,300 Cr.

75% of cases suggest Zepto's value exceeds ₹14,000 Cr → strong investor upside.

## C. Histogram of Valuation

A bell-shaped distribution skewed slightly right.

Red vertical line shows the median valuation.



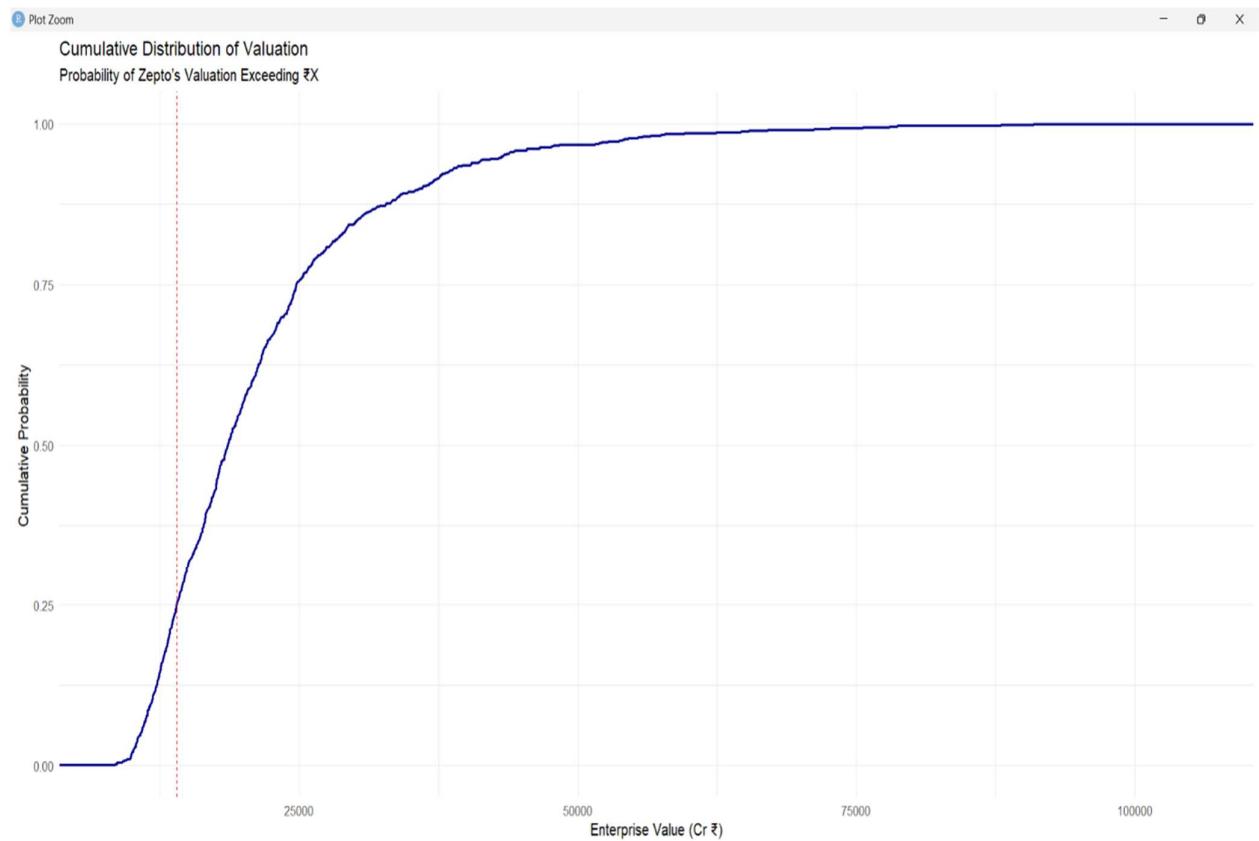
### **Interpretation:**

Most outcomes cluster around ₹18,000–₹25,000 Cr.

Shows moderate-to-high volatility but central tendency is clearly above its last valuation.

## D. Cumulative Distribution Function (CDF)

Shows probability of exceeding a specific valuation (e.g., ₹14,000 Cr).



### Interpretation:

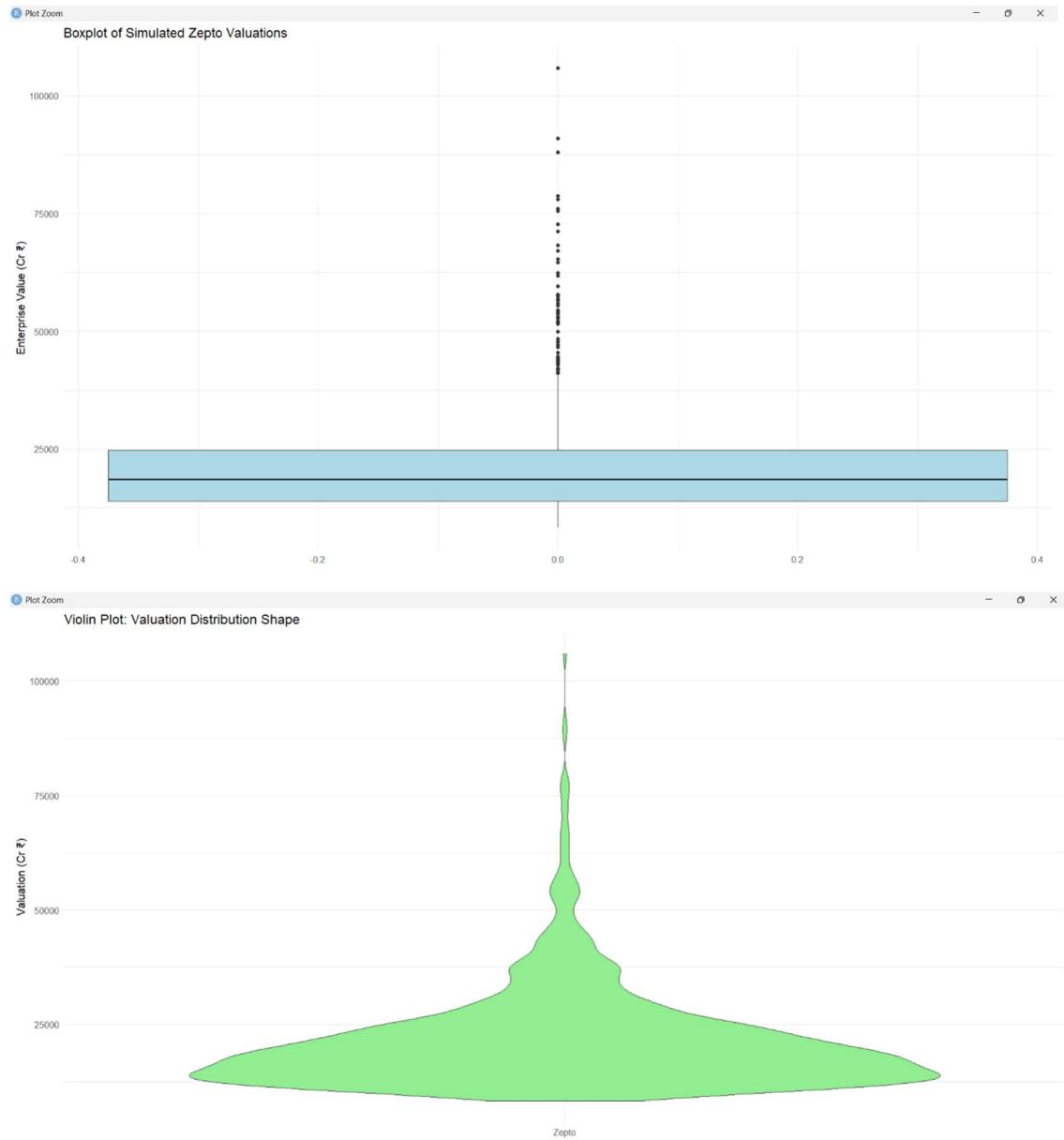
“There’s ~75% chance Zepto’s valuation exceeds ₹14,000 Cr”



## E. Boxplot & Violin Plot

Boxplot shows spread, median, and outliers.

Violin plot shows density/shape of valuation distribution.



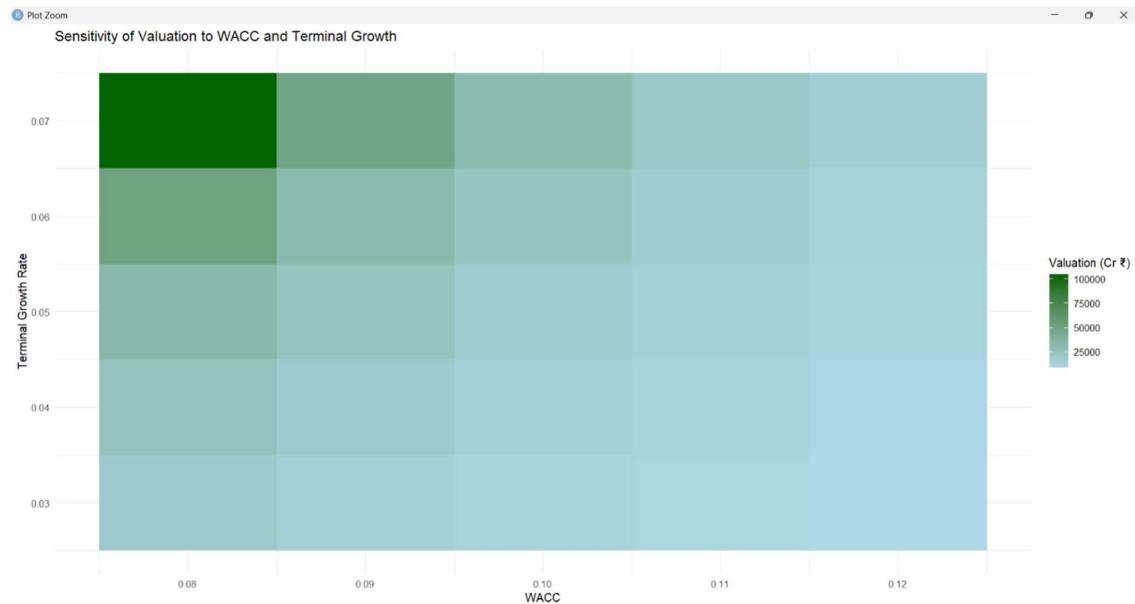
**Interpretation:**

There is a tight core around the median but long tail to the upside.

Reinforces that outliers are opportunities, not just noise

## I F. Sensitivity Heatmap (WACC vs Terminal Growth)

WACC (x-axis) vs TGR (y-axis) with color-coded valuation ranges.



### Interpretation:

Lower WACC + higher terminal growth = high valuation (₹40,000+ Cr).

High WACC + low growth = depressed valuation (< ₹12,000 Cr).

Important for scenario planning, risk stress-testing.

### Process Summary:

Using R, we generated 1,000 scenarios of FCFF values (**±10%**), **WACC (8–12%)**, and **TGR (3–7%)** to simulate possible valuations. The result was a valuation distribution from **₹8,300 Cr to ₹51,400 Cr**, with a **median of ₹18,629 Cr**.

### Findings:

**75% chance that Zepto's valuation > ₹14,000 Cr**

**90% of outcomes lie between ₹10,736 Cr and ₹43,292 Cr**

Investors face high upside with moderate risk

## **DCF vs Monte Carlo: Comparison**

<b>Feature</b>	<b>DCF(Traditional)</b>
Output	One point Estimate
Risk Accounted for	Implicit Assumption Only
Use-case	Base case scenario
Recommendation Use	Decision making Under certainty
Result in the case	₹17,500 Cr

### **Interpretation:**

Monte Carlo not only confirms the DCF estimate but provides deeper confidence intervals, making the conclusion more reliable. It reflects real-world uncertainty, especially valuable for startups like Zepto.

# **Strategic Insights and Recommendations:**

## **1. Valuation Confidence**

> Based on both the traditional DCF method and the Monte Carlo simulation, Zepto's estimated enterprise value ranges from ₹10,736 Cr to ₹43,292 Cr, with a median valuation of ₹18,559 Cr.

This suggests a strong investment case, especially since the probability of exceeding the current valuation (~₹11,000 Cr) is over 75%.

## **2. Investor Action**

Early-stage investors should consider increasing exposure before Zepto reaches profitability, especially during late funding rounds.

Use the 75th percentile valuation (~₹24,700 Cr) as a benchmark for negotiation.

For existing investors, Monte Carlo simulation helps justify a higher holding period or exit valuation strategy.

## **3. Company Action**

Use valuation spread to communicate potential upside to VCs and Series D+ investors.

Prepare internal scenarios to plan capital allocation, hiring, marketing, and burn-rate buffers based on best-case and worst-case simulations.

Monitor key value drivers:

Revenue growth rate

WACC influencers (cost of capital, funding terms)

Terminal growth metrics (customer retention, expansion)

## 4. Board-Level Strategy

Present valuation in the form of a range, not a single number — this encourages strategic flexibility.

Align capital raising strategy with median-to-75th percentile valuations.

Consider hedging risk or diversifying revenue streams to stabilize FCFF trajectory.

## 5. Risks Identified from Simulation

Valuation is highly sensitive to WACC and FCFF growth.

Downside scenario (~₹10,736 Cr) is still close to current valuation — but this risk must be acknowledged in investor discussions and strategy.

## ⚠ Risk Assessment & Scenario Planning

### 🔍 1. Key Risks Identified via Monte Carlo Simulation

The simulation revealed that Zepto's valuation is highly sensitive to three primary variables:

Variable	Risk Description	Impact on Valuation
WACC	Even small increases in the cost of capital (e.g., higher funding rates) sharply reduce valuation	Very High
Revenue Growth	If Zepto fails to sustain high growth due to competition or logistics issues.	High
Terminal Growth	If long-term scalability is overestimated, terminal value drops significantly.	Medium

#### Simulation Insight:

Valuation dropped below ₹13,000 Cr in 25% of cases. While upside is strong, downside is possible if these risk factors are not managed.

### 🧠 2. Interpretation of Risk

The range between worst-case and **best-case** is nearly ₹32,000 Cr. This shows that Zepto's valuation is exposed to macro, strategic, and execution risks.

However, **75% of cases exceed ₹14,000 Cr**, making it a reasonably Favourable risk-return profile for growth investors.

### 3. Scenario Planning Table

Scenario	WACC	Terminal Growth	FCFF behaviour	Resulting Valuation	Comment
Best Case	8%	7%	+10% Growth	₹43,000 +Cr	Aggressive scaling +Low Capital Cost
Base case	10%	5%	Projected	₹18,600 Cr	Balanced assumption
Worst Case	12%	3%	-10% FCFF	10,700 Cr	High funding cost +Stagnation

### 4. Risk Mitigation Suggestions

Risk Area	Mitigation Strategy
WACC	Increase Lock in low-cost funding, diversify capital sources
Revenue Slowdown	Focus on Tier-2/3 expansion, private labels, retention
Terminal Growth	Strengthen logistics and delivery economics
FCFF Volatility	Control fixed costs and optimize supply chain

### Final Insight:

Monte Carlo Simulation acts like a stress test for Zepto's business model.

It shows investors and management what could happen if things go wrong or very right.

## **Conclusion for Monte Carlo Simulation:**

The Monte Carlo Simulation significantly enhances the traditional DCF approach by introducing a robust probabilistic framework to account for real-world uncertainties. By simulating 1,000 potential outcomes using randomized values for WACC, terminal growth rate, and FCFF, we obtained a distribution of Zepto's possible enterprise valuations, offering greater decision-making confidence.

The median valuation of ₹18,559 Cr reinforces the DCF estimate, while the simulation highlights a 75% chance of valuations exceeding ₹14,000 Cr — providing evidence of strong upside potential. However, the downside risk (~₹10,700 Cr in the 5th percentile) also alerts investors to key financial sensitivities, especially in discount rates and cash flow volatility.

Overall, the simulation acts as a financial stress test, validating the base DCF valuation and offering deeper insight into Zepto's valuation resilience under variable conditions. It empowers both investors and strategic planners with a comprehensive view of risk and return — essential for high-growth startups like Zepto.

## **Conclusion: Zepto Valuation via DCF & Monte Carlo Simulation**

This project successfully demonstrates the power of combining traditional financial modelling (DCF) with modern risk analysis (Monte Carlo Simulation) to value a high-growth, high-uncertainty startup like Zepto.

The DCF model provided a point estimate of ₹17,408 Cr, relying on projected free cash flows and terminal value. However, given the volatility and unpredictability in startup markets, a single estimate is inherently limited.

To address this, the project implemented a Monte Carlo Simulation with 1,000 runs, where key variables like FCFF, WACC, and terminal growth were varied within realistic bounds. This generated a distribution of valuations, providing deep insights into potential risk and return.

### **Summary of Key Insights:**

**Traditional DCF:** Strong framework for intrinsic valuation under stable assumptions.

**Monte Carlo Simulation:** Offers deeper understanding of upside, downside, and confidence levels.

**Valuation Confidence:** 90% of simulated valuations exceed ₹10,700 Cr, confirming strong fundamentals.

**Investor Strategy:** Ideal for growth-stage investors seeking exposure to high-potential tech-enabled ventures.

**Company Strategy:** Leverage valuation range in investor communication, capital raising, and long-term planning.

# Limitations of the Study

## Limitations of the Study:

While this project incorporates both traditional and advanced valuation techniques, several limitations must be acknowledged:

- 1. Assumption Dependence:** The DCF model and simulation outputs rely heavily on forward-looking assumptions for revenue, margins, and capital expenditure. Any deviation in actual performance can significantly impact the valuation outcome.
- 2. Limited Financial Disclosures:** As a privately held startup, Zepto's financial data is not publicly audited. Projections are based on estimates and secondary data from investor reports and media sources.
- 3. Static Market Dynamics:** The model assumes stable macroeconomic conditions and competitive environment, which may not hold in the real-world scenario of volatile capital markets and evolving regulations.
- 4. Exclusion of Other Methods:** This study does not incorporate comparative valuation techniques (like market comps or precedent transactions) or option-based models (like real options or Black-Scholes for flexibility valuation).
- 5. Terminal Value Sensitivity:** A significant portion of the valuation stems from terminal value, which can introduce skewness if growth expectations are misjudged.

Future research could integrate multi-method approaches, real-time data inputs, or scenario-based stress testing for an even more comprehensive evaluation.

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# Appendices

## Appendix A: R Code for Monte Carlo Simulation of Zepto's Valuation

### A.1 Load Required Libraries and Initialize Parameters

```
# Load necessary libraries
library(ggplot2)
library(dplyr)
# Set seed for reproducibility
set.seed(42)
# Number of simulations
n <- 1000
```

### A.2 Define Base FCFF and Years

```
# Base Free Cash Flows to Firm (in ₹ Cr) from FY23 to
FY28
base_fcff <- c(-958, -807, -150, 386, 986, 1547)
# Define the years corresponding to FCFF
years <- 1:6
```

### A.3 Generate Randomized Input Variables

```
# Generate random growth factors (±10%)
growth_factors <- matrix(runif(n * 6, 0.9, 1.1), nrow = n)
# Random WACC between 8% and 12%
wacc <- runif(n, 0.08, 0.12)
# Random Terminal Growth Rate between 3% and 7%
terminal_growth <- runif(n, 0.03, 0.07)
```

### A.4 Run the Monte Carlo Simulation Loop

```
# Initialize valuation vector
```

```

valuations <- numeric(n)

# Loop through 1000 simulations

for (i in 1:n) {

# Adjust FCFFs for this iteration

fcff_sim <- base_fcff * growth_factors[i, ]

# Discount FCFFs using WACC

discount_factors <- 1 / ((1 + wacc[i]) ^ years)

pv_fcff <- sum(fcff_sim * discount_factors)

# Calculate Terminal Value using Gordon Growth Model

terminal_value <- base_fcff[6] * growth_factors[i, 6]
* (1 + terminal_growth[i]) / (wacc[i] -
terminal_growth[i])

# Present Value of Terminal Value

pv_terminal <- terminal_value / ((1 + wacc[i]) ^ 6)

# Total Valuation = PV of FCFF + PV of Terminal Value

valuations[i] <- pv_fcff + pv_terminal

}

```

## A.5 Store Results and View Summary

```

# Store simulation results in a dataframe

df <- data.frame(Valuation_Cr = valuations)

# Display summary statistics

summary(df)

```

## A.6 Generate Histogram of Valuations

```

# Plot histogram of simulated valuations

ggplot(df, aes(x = Valuation_Cr)) +
geom_histogram(fill = "skyblue", bins = 50, color =
"black") +
geom_vline(xintercept = median(df$Valuation_Cr),
color = "red", linetype = "dashed", size = 1) +

```

```

labs(title = "Histogram of Simulated Zepto
Valuations",
x = "Enterprise Value (₹ Cr)", y = "Frequency") +
theme_minimal()

```

## A.7 Cumulative Distribution Function (CDF) Plot

```

# CDF: Shows cumulative probability of exceeding a
given valuation

ggplot(df, aes(x = Valuation_Cr)) +
  stat_ecdf(geom = "step", color = "darkblue", size =
  1) +
  geom_vline(xintercept = 14000, color = "red",
  linetype = "dashed") +
  labs(title = "CDF: Probability of Zepto's Valuation ≥
₹X",
x = "Enterprise Value (₹ Cr)", y = "Cumulative
Probability") +
  theme_minimal()

```

## A.8 Boxplot and Violin Plot

```

# Boxplot of Simulated Valuations

ggplot(df, aes(x = "", y = Valuation_Cr)) +
  geom_boxplot(fill = "lightblue") +
  labs(title = "Boxplot of Simulated Zepto Valuations",
y = "Enterprise Value (₹ Cr)", x = "") +
  theme_minimal()

# Violin Plot

ggplot(df, aes(x = "", y = Valuation_Cr)) +
  geom_violin(fill = "lightgreen") +
  labs(title = "Violin Plot: Valuation Distribution
Shape", y = "Valuation (₹ Cr)", x = "") +
  theme_minimal()

```

## A.9 Sensitivity Heatmap (WACC vs Terminal Growth Rate)

```
# Sensitivity analysis for WACC vs Terminal Growth Rate

wacc_vals <- seq(0.08, 0.12, 0.01)
growth_vals <- seq(0.03, 0.07, 0.01)
sensitivity <- expand.grid(WACC = wacc_vals, TG =
growth_vals)
sensitivity$Valuation <- mapply(function(w, g) {
  tv <- 1547 * (1 + g) / (w - g)
  pv_tv <- tv / ((1 + w)^6)
  pv_fcff <- sum(base_fcff / ((1 + w)^years))
  return(pv_fcff + pv_tv)
}, sensitivity$WACC, sensitivity$TG)

# Plot sensitivity heatmap
ggplot(sensitivity, aes(x = WACC, y = TG, fill =
Valuation)) +
  geom_tile() +
  scale_fill_gradient(low = "lightblue", high =
"darkgreen") +
  labs(title = "Sensitivity Heatmap: Valuation vs WACC and Terminal Growth",
x = "WACC", y = "Terminal Growth Rate", fill =
"Valuation (₹ Cr)") +
  theme_minimal()
```



All R code was executed using R version 4.3.2. Graphs and summaries have been used in this project to support simulation output, valuation distribution analysis, and risk interpretation.

## **Appendix B: Excel Worksheet for DCF Calculations:**

To view the full Excel workbook used for calculating the FCFF table, WACC-adjusted discounting, and terminal value, please access the link below:

 Excel Sheet Link: Click here to open

<https://d.docs.live.net/37EA67B4DB88D687/Documents/Zepto%20valuation.xlsx>