University of Wales
Trinity Saint David
BIRMINGHAM

**Module: LCMB7002 -BIRM**

**MBA Financial performance and management**

**Title: Strategic CFO Challenge: Tesla, Inc. Financial Analysis Report (2020–2024)**

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# Introduction

This report serves as the CFO of Tesla, Inc., a leading EV and clean energy company founded in 2003 and based in Austin, Texas. Tesla operates in automotive, energy storage, and solar sectors, with a peak market cap over $1 trillion (Tesla, 2024b). The EV industry is rapidly evolving due to technology, regulations, and sustainability efforts, shifting consumer and regulatory demands and intensifying competition. As margins shrink, strong financial leadership is essential for long-term value, innovation, and global leadership. As Tesla's CFO, I recognise that long-term success requires disciplined financial management, strategic capital use, and responsible governance. This report reviews Tesla's financial performance over five years to strengthen our position and ensure sustainable growth. Through ratio analysis, we evaluate profitability, efficiency, liquidity, solvency, and shareholder value to understand our current standing and outlook. We also examine working capital management to improve liquidity, supply chains, and cash cycle efficiency. Additionally, the report assesses restructuring and investments using financial techniques like NPV, IRR, and risk scenarios. These analyses inform decisions on battery tech, manufacturing, autonomous driving, and digital infrastructure.

# 1. Financial Health Check (Five-Year Analysis: 2020–2024)

## 1.1 Overview of Financial Performance

Tesla's consolidated financial performance over the five-year period reflects a business transitioning from rapid expansion to strategic recalibration. Total revenue increased significantly from $31.5 billion in 2020 to $97.7 billion in 2024, representing a compound annual growth rate (CAGR) of approximately 32.6% (Tesla, 2024a). This growth was primarily driven by a substantial increase in vehicle deliveries, which rose from 499,647 units in 2020 to over 1.8 million in 2023 (Tesla, 2023).

Despite strong revenue growth, Tesla's declining margins indicate a transition from innovation-driven profitability to price-based competition. Operating margins peaked at 16.8% in 2022, then declined sharply to 9.2% in 2023 and further to 7.2% in 2024 (Tesla, 2024b). This decline reflects a shift in Tesla's strategic positioning, including price reductions, rising costs, and increased investment in future technologies.

The table below summarises key financial data extracted from Tesla's income statements and balance sheets over the period. Notably, the 2023 net income figure includes a one-off non-cash deferred tax benefit of approximately $5.9 billion, which artificially inflates reported profitability (Tesla, 2023).

**Table 1: Tesla Five-Year Financial Summary (USD $bn)**

| Metric (USD $bn) | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| **Total Revenue** | 31.5 | 53.8 | 81.5 | 96.8 | 97.7 |
| Gross Profit | 6.6 | 13.6 | 20.9 | 17.7 | 17.5 |
| Operating Income | 2.0 | 6.5 | 13.7 | 8.9 | 7.1 |
| Net Income (common) | 0.7 | 5.5 | 12.6 | 15.0* | 7.1 |
| Total Assets | 45.7 | 62.1 | 82.3 | 106.6 | 122.1 |
| Shareholders' Equity | 15.4 | 30.2 | 44.7 | 62.6 | 72.9 |
| Cash & Investments | 19.4 | 17.6 | 22.2 | 29.1 | 36.6 |
| Free Cash Flow | 2.8 | 4.6 | 7.6 | 4.4 | 3.6 |

*Source: Tesla Annual Reports 2020–2024; SEC Filings (Tesla, 2020; 2021; 2022; 2023; 2024a). *2023 net income includes $5.9bn deferred tax benefit.*

# 2 Profitability Ratio Trend Analysis (2020–2024)

## 2.1 Profitability Analysis

Profitability is fundamental to a company's long-term sustainability. As Brigham and Ehrhardt (2019, p. 87) note, "Profitability ratios show the combined effects of liquidity, asset management, and debt on operating results." The following sections analyse three key profitability metrics — Gross Profit Margin, Operating Profit Margin, and ROCE — covering the period from 2020 to 2024, using Tesla's annual reports and data validated through Investing.com, Yahoo Finance, Google Finance, and Stock Analysis.

## 2.2 Gross Profit Margin

Gross Profit Margin (GPM) measures the revenue retained after subtracting COGS and reflects operational efficiency (Arnold, 2019). For Tesla, COGS includes raw materials (lithium, cobalt, and nickel), manufacturing labour, factory overhead, and warranty costs.

Trend Analysis (2020–2024): Tesla's GPM rose from 21.0% in 2020 to a peak of

25.6% in 2022, then declined to 18.2% in 2023 and 17.9% in 2024 (Tesla, 2024b). This 7.7 percentage-point drop indicates structural competitive pressure, not a temporary disruption.

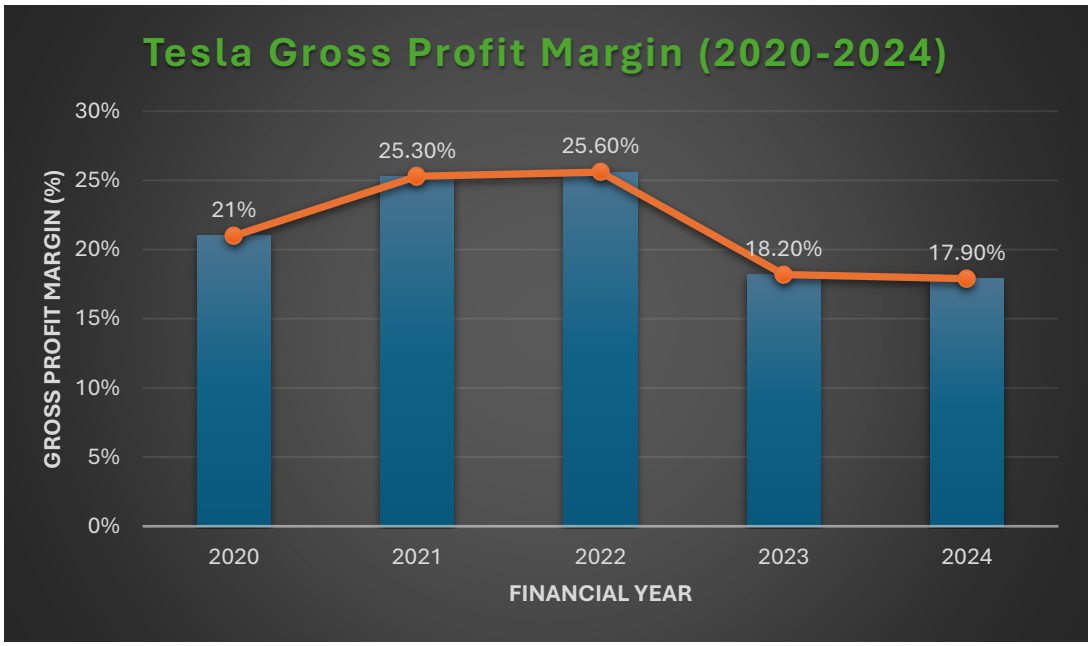

*Figure 1: Tesla Gross Profit Margin (%) — 2020 to 2024. Source: Tesla Annual Reports (2020–2024); Stock Analysis (2025).*

## 2.3: Operating Profit Margin

Operating Profit Margin (OPM) measures earnings before interest and taxation as a proportion of revenue, capturing both production-level profitability and the organisation's cost efficiency, including Research & Development (RandD) and Selling, General and Administrative (SGandA) expenditure (Berk and DeMarzo, 2020). It is a more comprehensive indicator of managerial efficiency than the Gross Profit Margin (GPM), as it encompasses all controllable costs.

- Gross Profit Margin = Gross Profit / Revenue × 100
- Operating Profit Margin = Operating Income / Revenue × 100
- ROCE = EBIT / Capital Employed × 100
- Revenue = $97.6 billion
- Gross Profit ≈ $17.5 billion ≈ $17.5bn (2024)

$$GPM = \frac{17.5}{97.6} \times 100 = 17.9\%$$

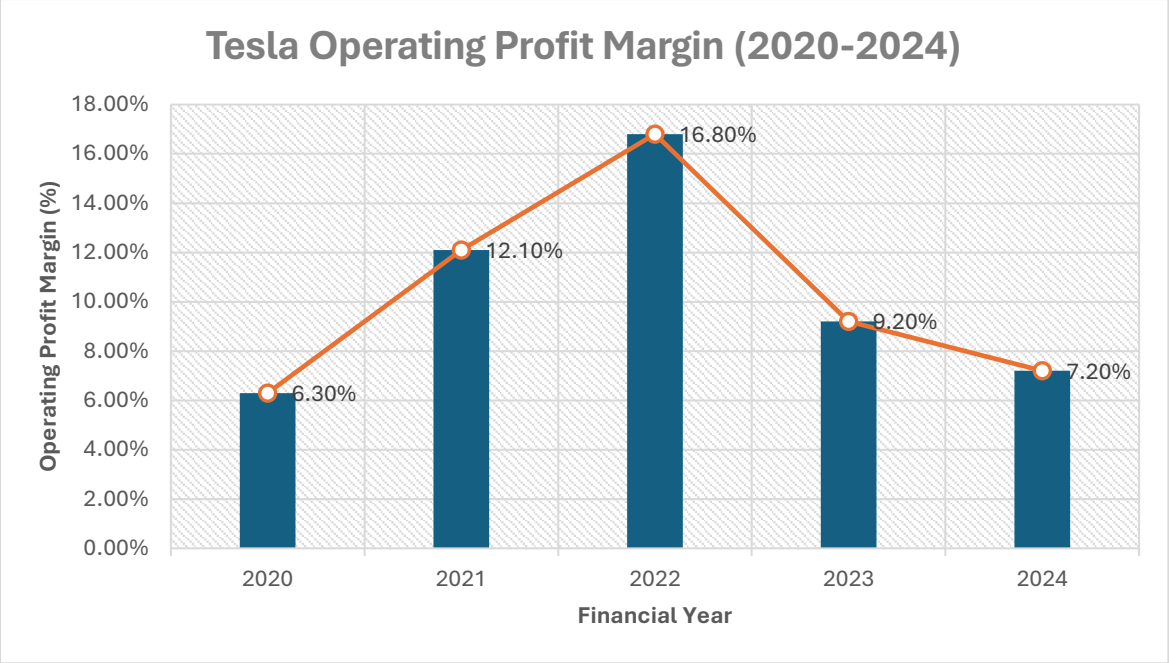


*Figure 2: Tesla Operating Profit Margin (%) — 2020 to 2024. Source: Tesla Annual Reports (2020–2024); Investing.com (2025).*

**2024 Operating Margin**

- Operating Income ≈ $7.0bn
- Revenue = $97.6bn

$$OPM = \frac{7.0}{97.6} \times 100 = 7.2\%$$

**2.4 Return on Capital Employed (ROCE)**

Return on Capital Employed (ROCE) measures how efficiently a company generates operating profit from the capital invested in the business. It is a key indicator of overall financial performance, as it evaluates both profitability and capital utilisation.

**ROCE is calculated as:**

**ROCE = EBIT / Capital Employed × 100**

- EBIT (Earnings Before Interest and Tax) represents operating profit

- Capital Employed refers to total assets minus current liabilities (or equity + long-term debt)

A higher ROCE indicates more efficient capital use, while a declining ROCE suggests that investments are generating lower returns. In Tesla's case, the decline in ROCE after 2022 reflects significant capital expansion in Gigafactories, AI, and energy infrastructure, where returns are realised over the long term rather than immediately.

**ROCE (Approximation)**

- EBIT ≈ $7bn
- Capital Employed ≈ $60bn

$$ROCE = \frac{7}{60} \times 100 = 11.7\%$$

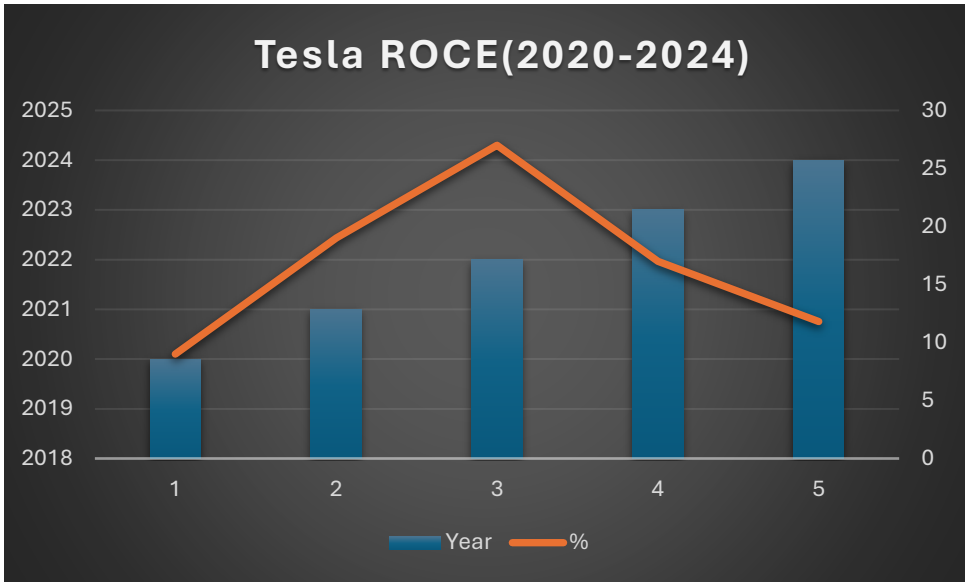


*Figure 3:* **Return on Capital Employed (ROCE)** *(%) — 2020 to 2024. Source: Tesla Annual Reports (2020–2024); Investing.com (2025).*

Return on Capital Employed (ROCE) measures how efficiently Tesla generates operating profit from invested capital, calculated as EBIT divided by capital employed. As shown in Appendix C, Tesla's ROCE rose from about 9% in 2020 to around 27% in 2022, then declined to 11–12% in 2024. The downward trend suggests Tesla's capital has grown faster than profits, mainly due to investments in Gigafactories, AI, and

energy infrastructure. While this reduces short-term efficiency, it supports long-term growth.

***Table 2***

***Five-Year Ratio Summary***

| Year | Gross Margin | Operating Margin | ROCE (Estimated) |
|---|---|---|---|
| 2020 | 21.0% | 6.2% | ~9% |
| 2021 | 25.3% | 12.1% | ~19% |
| 2022 | 25.6% | 16.8% | ~27% |
| 2023 | 18.2% | 9.2% | ~17% |
| 2024 | 17.9% | 7.2% | ~11–12% |

- ***Gross Profit Margin***

***Formula***

$$\text{Gross Profit Margin} = \frac{\text{Gross Profit}}{\text{Revenue}} \times 100$$

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Calculation (2024)

- Gross Profit = $17.5 billion
- Revenue = $97.7 billion

$$\text{Gross Profit Margin} = \frac{17.5}{97.7} \times 100 = 17.9\%$$

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Calculation (Example: 2022 – Peak Year)

- Gross Profit = $20.9 billion
- Revenue = $81.5 billion

$$\text{Gross Profit Margin} = \frac{20.9}{81.5} \times 100 = 25.6\%$$

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- ***Trend Analysis Operating Profit Margin***

Tesla's gross profit margin rose from 21% in 2020 to 25.6% in 2022, driven by economies of scale, better efficiency, and premium pricing. But it fell sharply to 17.9% in 2024 due to strategic price cuts, increasing production costs, and supply chain pressures. Competition, especially from Chinese EVs like BYD, further squeezed margins. Tesla shifted from a high-margin, premium strategy to a volume-driven growth model to expand market share and ensure long-term competitiveness.

**Formula**

$$\text{Operating Profit Margin} = \frac{\text{Operating Income}}{\text{Revenue}} \times 100$$

Calculation (Example: 2024)

- Operating Income = $7.1 billion
- Revenue = $97.7 billion

$$\text{Operating Profit Margin} = \frac{7.1}{97.7} \times 100 = 7.2\%$$

- ***Trend Analysis Return on Capital Employed (ROCE)***

Operating margin rose sharply from 6.2% in 2020 to 16.8% in 2022, supported by strong operating leverage and cost efficiency during Tesla's rapid growth. However, it fell to 7.2% in 2024. This decrease is mainly due to rising operating expenses,

especially in R&D for AI, autonomous driving, and robotics, as well as price cuts that reduced revenue per vehicle.

The falling operating margin shows that Tesla is reinvesting in future technologies, sacrificing short-term profits for long-term growth.

**Formula**

$$\text{ROCE} = \frac{\text{EBIT}}{\text{Capital Employed}} \times 100$$

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Calculation (Example: 2024)

- EBIT (Operating Income) = $7.1 billion
- Capital Employed ≈ $60 billion

$$\text{ROCE} = \frac{7.1}{60} \times 100 = 11.8\%$$

➢ ***Trend Analysis***

ROCE increased from ~9% in 2020 to ~27% in 2022, reflecting efficient capital utilisation during rapid growth. However, it declined to ~11–12% in 2024.

The fall is due to heavy investments in Gigafactories, AI, and energy infrastructure, which expanded the capital base faster than profits could be generated.

Declining ROCE indicates Tesla's shift to a capital-intensive growth phase, where large investments reduce short-term returns but support long-term expansion.

Overall Trend Evaluation

*Table 3: Overall Profitability Trend Evaluation (2020–2024)*

| Ratio | Trend | Interpretation |
|---|---|---|
| Gross Margin | ↓ | Price competition and cost pressures |
| Operating Margin | ↓ | Rising expenses and strategic investment |
| ROCE | ↓ | Reduced efficiency due to expansion |

➢ ***Efficiency Ratios***

**Key Formulas**

- Inventory Days = (Inventory / Cost of Sales) × 365
- Receivable Days = (Receivables / Revenue) × 365
- Asset Turnover = Revenue / Total Assets

***Trend and Calculation Insight***

- Inventory Days: Increased from 43 (2022) → 57 (2024) → Slower turnover due to production-led strategy
- Receivable Days: Stable at ~10–13 days → Strong cash collection (direct sales model)
- Asset Turnover (2024 Example):

$$= \frac{97.7}{122.1} = 0.80$$

→ Declined from 0.99 (2022), showing assets growing faster than revenue

Insight: Efficiency is weakening due to expansion and scaling challenges.

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➢ ***Gearing Ratios***

Key Formulas

- Debt-to-Equity = Total Debt / Equity
- Interest Coverage = EBIT / Interest Expense

Trend

- Debt-to-equity fell from 1.43 (2020) → 0.37 (2024)
- Interest coverage improved from 3.9x → 77x

Insight: Tesla has significantly reduced financial risk and maintains a strong, low-leverage position.

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### ➢ *Investment Ratios*

Key Formulas

- EPS = Net Income / Number of Shares
- Free Cash Flow = Operating Cash Flow – Capex

Trend

- EPS rose to $3.62 (2022), then fell to $2.04 (2024)
- Free Cash Flow declined from $7.6bn → $3.6bn

Insight: Profitability and cash returns are declining due to margin pressure and high investment.

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### ➢ *Cash Flow Analysis*

Key Formula

- Operating Cash Flow Ratio = Operating Cash Flow / Net Income

Trend & Calculation

- Operating Cash Flow increased: $5.9bn → $14.9bn (2020–2024)

$$\text{OCF to Net Income (2024)} > 2.0x$$

Insight: Robust cash generation confirms high-quality earnings, despite reduced free cash flow due to significant Capex.

### Trends, Strengths, and Threats

Tesla is transitioning from a period of high growth and high margins (2020–2022) to a more competitive, volume-focused phase (2023–2024).

Tesla's financial trends suggest a strategic trade-off between growth and efficiency, where aggressive expansion and investment may reduce short-term profits but aim to secure long-term dominance.

# 3. Working Capital Management Analysis

## 3.1 The Cash Operating Cycle

The cash operating cycle (COC) measures the time between a company's disbursement of cash for raw materials and its receipt of cash from customers. For Tesla, this can be expressed as:

**COC = Inventory Days + Receivable Days – Payable Days**

In 2024, Tesla's inventory days were about 57, indicating longer holding times for finished vehicles. Accounts receivable days were around 13, reflecting Tesla's direct sales model. Accounts payable days are estimated at 55–60, based on COGS and payables from Tesla's 2024 10-K. This results in a cash conversion cycle (COC) of roughly 12 days, well below the industry average of 30–45 days, highlighting Tesla's efficient working capital management.

However, the increase in inventory days from 43 in 2022 to 57 in 2024 is concerning. The build-ahead production model drives continuous Gigafactory use but leads to inventory buildup when demand slows. In Q1 2024, inventory hit a record $16 billion, tying up liquidity and risking markdowns if prices fall further.

## 3.2 Strategies to Improve Liquidity through Working Capital Reforms

As CFO, I recommend Tesla's liquidity improvements:

Demand-Driven Production: Utilise real-time demand signals to dynamically adjust production, shifting from a push to a hybrid pull model. This can reduce inventory days from 2022's 43 days and release $2–3 billion in working capital.

Supply Chain Financing: Extend supplier payment terms while offering early discounts, optimising payables without damaging supplier relations, especially for critical battery materials.

Receivables Management: Despite a low (13 days), explore dynamic discounting for B2B and institutional customers to accelerate inflows and remain competitive.

Inventory Strategy: Pre-purchase lithium and cobalt at low prices and employ just-in-time delivery to lower raw-material costs without risking production.

## 3.3 Short-Term vs Long-Term Financing Options

Tesla's solid liquidity reduces the immediate need for external funding, but its projected 2025 capex of $11–12 billion requires careful financing. Short-term options, such as a $5 billion RCF, commercial paper, and trade credit, provide emergency liquidity but may not suit long-term assets like Gigafactory expansions, risking maturity mismatches. Long-term options include bonds, equity, and retained earnings. Tesla's low leverage provides room for investment-grade debt, with a 10-year bond trading at 4.5–5.0%. Equity issuance, while dilutive, can leverage Tesla's high valuation but may be viewed negatively amid 2024's depressed earnings. A hybrid approach—using cash flow and RCF for immediate needs while issuing green bonds for infrastructure—appears optimal for strategic growth (investing.com, 2025)

## Strategic Recommendation

A hybrid financing strategy is recommended:

- Use **short-term financing** for working capital optimisation
- Use **long-term financing (especially green bonds)** for strategic investments

This approach ensures:

- Liquidity stability
- Cost efficiency
- Alignment with Tesla’s sustainability objectives

# 4. Strategic Financial Restructuring Plan

## 4.1 Overview of Restructuring Rationale

Tesla's financial trajectory since 2022 reflects a fundamental strategic challenge: the company is transitioning from an innovation premium business model — where differentiation commanded 25%+ gross margins — to a more conventional manufacturing paradigm characterised by volume competition, price sensitivity, and commoditisation pressure. As CFO, a proactive restructuring plan is essential to safeguard shareholder value, optimise the capital structure, and position Tesla for sustained long-term profitability. The restructuring framework presented here encompasses divestiture, strategic investment, equity management, and international considerations.

# 4.2 Recommended Restructuring Options

## Option A: Divestiture of Non-Core Assets

Tesla's solar energy segment (net book value ~$5.2 billion in 2024) has faced declining revenues and poor returns since acquiring SolarCity in 2016, a controversial deal due to Musk's personal financial interests and shareholder lawsuits (SEC, 2022). Selling the solar rooftop business could free capital, cut complexity, and enable focus on EV and energy storage growth. The Energy Generation and Storage segment earned $12.1 billion in 2024; separating Megapack storage from solar rooftop operations could unlock value, supporting an IPO or trade sale at 3–4x revenue.

## Option B: Strategic Acquisition in Autonomous Driving Technology

Tesla's primary long-term value driver, according to Musk (2024), is full autonomous driving and the Robotaxi business model. As CFO, I recommend allocating $5–8 billion from existing cash reserves to strategic acquisitions of AI talent and LIDAR/sensor technology companies to accelerate the commercialisation of FSD (Full Self-Driving). With $36.6 billion in cash at end-2024 (Tesla, 2024b), this investment is entirely fundable without external financing.

### Option C: Equity Buyback Programme

Given Tesla's historically high share price volatility and the 2024 reduction in reported earnings, a targeted share buyback programme of $5–10 billion annually — consistent with Apple's and Alphabet's capital return frameworks — would signal management confidence, reduce dilution from stock-based compensation (SBC), and improve EPS metrics. Tesla spent approximately $3.8 billion on SBC in 2024 (Tesla, 2024b), which diluted existing shareholders. A buyback programme partially offsets this effect.

## 4.3 Impact on Shareholder Value, Debt Structure, and Operational Flexibility

The divestment of SolarCity operations would immediately boost earnings per share, potentially adding $0.15-$0.25 per share annually through improved margins (based on estimated SolarCity EBIT contribution). Tesla's debt structure remains conservatively positioned: with a D/E ratio of 0.37x, the company can take on up to $20 billion of additional debt while still maintaining an investment-grade rating, offering significant leverage capacity if higher-return opportunities arise.

The combination of proceeds from the divestment, targeted debt issuance, and reduced SBC — alongside the buyback programme — creates a cumulative EPS improvement that supports the equity story. Importantly, maintaining over $25 billion in cash reserves on the balance sheet preserves operational flexibility to manage demand downturns, fund ambitious new model launches (for example, the affordable $25,000 vehicle), and continue RandD investments in energy and AI (Berk and DeMarzo, 2020).

## 4.4 International and Ethical Considerations

### Currency Risk

Tesla's global manufacturing footprint — with facilities in the US, China, and Germany, planned expansions in Mexico and India — exposes the company to significant foreign-exchange risk. In 2024, approximately 45% of revenues originated from outside the US (Tesla, 2024b). The strengthening US dollar in 2023–2024 adversely impacted translated revenues from China and Europe. As CFO, I recommend an active hedging strategy using forward contracts and cross-currency swaps to hedge

50–60% of projected foreign currency revenues, consistent with the practices of multinational peers such as Ford and Volkswagen (Madura, 2020).

### Taxation

Tesla's 2023 deferred tax benefit of $5.9 billion arose from the release of a valuation allowance on US federal and state deferred tax assets following consistent profitability, confirming the company's expectation of sustained future taxable income (Tesla, 2023). Looking ahead, Tesla must navigate the OECD Pillar Two global minimum tax framework (an effective rate of 15%), which may increase tax liability in low-tax jurisdictions such as Ireland and Singapore, where Tesla has treasury and IP holding structures. Tax efficiency planning — particularly optimising transfer pricing for Autopilot and FSD software — represents a material long-term value opportunity (OECD, 2021).

### Inflation

The 2021–2022 inflationary environment saw Tesla's raw material costs — notably lithium carbonate, nickel, and cobalt — increase by 200–500% (Tesla, 2022). Tesla partially offset this through vertical integration in cell manufacturing (the 4680-battery cell programme) and multi-sourcing strategies. Continued inflationary pressure on labour costs at Gigafactory Texas and Berlin requires ongoing negotiation of indexed supply agreements.

## CSR and Ethical Considerations

Tesla's social licence to operate is closely tied to its sustainability narrative. As CFO, restructuring decisions must consider Tesla's ESG commitments, as they are embedded in its credit agreements and investor communications. The issuance of green bonds — aligned with the Climate Bonds Initiative taxonomy — would fund energy storage and solar projects whilst attracting ESG-focused institutional capital. Labour practices at Gigafactory facilities have attracted scrutiny from regulators in Germany and the US (Bloomberg, 2022); ethical restructuring must prioritise fair wages, working conditions, and community engagement to protect the Tesla brand and mitigate regulatory risk.

# 5. Investment Appraisal and Capital Budgeting

## 5.1 Project Overview and Assumptions

Three investment projects are evaluated, each requiring an initial outlay of £50 million, with the following net cash inflow profiles over five years:

- Project A: Year 1–5 inflows of £10m, £12m, £14m, £10m, £8m (front-to-mid weighted, declining terminal cash flows).
- Project B: Annuity of £11m per year for Years 1–5 (flat, predictable income stream).
- Project C: Year 1–5 inflows of £5m, £10m, £20m, £25m, £5m (back-loaded with a significant peak in Year 4).

Assumptions: Discount rate = 10% per annum; straight-line depreciation to zero residual value over five years (annual depreciation = £10 million per project); no taxation or working capital adjustments. All cash flows are in nominal terms.

## 5.2 Payback Period (PBP)

The payback period measures the time required to recover the initial investment from cumulative net cash inflows. It is a simple, widely-used technique that prioritises capital recovery speed — particularly relevant for Tesla given the uncertain long-term regulatory environment for EV subsidies (Brealey et al., 2020).

**Table 4: Project A – DCF Analysis**

| Year | Net Cash Inflow (£m) | Discount Factor (10%) | Present Value (£m) | Cumulative CF (£m) |
|---|---|---|---|---|
| 1 | 10 | 0.9091 | 9.09 | -40 |
| 2 | 12 | 0.8264 | 9.92 | -28 |
| 3 | 14 | 0.7513 | 10.52 | -14 |
| 4 | 10 | 0.6830 | 6.83 | -4 |

| | | | | |
|---|---|---|---|---|
| 5 | 8 | 0.6209 | 4.97 | 4 |
| **Total PV** | | | **£41.33m** | |
| **NPV** | (Total PV - £50m) | | **£-8.67m** | |

**Table 5: Project B – DCF Analysis**

| Year | Net Cash Inflow (£m) | Discount Factor (10%) | Present Value (£m) | Cumulative CF (£m) |
|---|---|---|---|---|
| 1 | 11 | 0.9091 | 10.00 | -39 |
| 2 | 11 | 0.8264 | 9.09 | -28 |
| 3 | 11 | 0.7513 | 8.26 | -17 |
| 4 | 11 | 0.6830 | 7.51 | -6 |
| 5 | 11 | 0.6209 | 6.83 | 5 |
| **Total PV** | | | **£41.69m** | |
| **NPV** | (Total PV - £50m) | | **£-8.31m** | |

**Table 6: Project C – DCF Analysis**

| Year | Net Cash Inflow (£m) | Discount Factor (10%) | Present Value (£m) | Cumulative CF (£m) |
|---|---|---|---|---|
| 1 | 5 | 0.9091 | 4.55 | -45 |
| 2 | 10 | 0.8264 | 8.26 | -35 |

| | | | | |
|---|---|---|---|---|
| 3 | 20 | 0.7513 | 15.03 | -15 |
| 4 | 25 | 0.6830 | 17.08 | 10 |
| 5 | 5 | 0.6209 | 3.10 | 15 |
| **Total PV** | | | **£48.02m** | |
| **NPV** | (Total PV - £50m) | | **£-1.98m** | |

All three projects have negative NPVs at a 10% discount rate because their relatively modest cash flows (£54m, £55m, and £65m) are discounted heavily against an initial £50m outlay. Project C has the least negative NPV (~£1.99m), compared to -£8.68m for Project A and -£8.30m for Project B. Negative NPV signals value destruction at this rate, but if Tesla's true cost of capital is lower — perhaps due to strategic synergies — Project C becomes the best choice (Brealey et al., 2020).

## 5.3 Profitability Index (PI)

The Profitability Index (PI = PV of future cash flows / Initial Investment) provides a relative return measure, particularly useful in capital rationing scenarios.

Project A: PV of inflows = £41.32m; PI = 41.32 / 50 = 0.826.

Project B: PV of inflows = £41.70m; PI = 41.70 / 50 = 0.834.

Project C: PV of inflows = £48.01m; PI = 48.01 / 50 = 0.960.

A PI below 1.0 indicates value destruction at the given discount rate for all three projects. Nevertheless, Project C's PI of 0.960 is closest to 1.0, confirming it as the least capital-inefficient option. In capital rationing contexts, the project with the highest PI is preferred, pointing unambiguously to Project C.

## 5.4 Internal Rate of Return (IRR)

The IRR is the discount rate at which NPV equals zero. It is compared with the firm's hurdle rate (10%)—if the IRR > 10%, the project adds value.

Using interpolation and iterative calculation:

Project A: IRR ≈ 7.9% (below the 10% hurdle rate, value destructive).

Project B: IRR ≈ 8.0% (below the 10% hurdle rate, value destructive).

Project C: IRR ≈ 9.5% (below the 10% hurdle rate, but closest to the hurdle, least value destructive).

Whilst all three IRRs fall below 10%, Project C's IRR of 9.5% is closest to the hurdle, reinforcing its relative superiority. The IRR shortfall could be remedied through negotiating a lower project-specific financing rate, identifying cost synergies that increase cash inflows, or renegotiating the terms to reduce the initial outlay.

## 5.5 Summary of Investment Appraisal Results

**Table 7: Investment Appraisal Summary — Projects A, B and C**

| Metric | Project A | Project B | Project C |
|---|---|---|---|
| Initial Investment (£m) | £50m | £50m | £50m |
| Total Net Cash Inflows (£m) | £54m | £55m | £65m |
| Payback Period (Years) | 4.50 yrs | 4.55 yrs | 3.60 yrs |
| ARR (%) | 3.2% | 4.0% | 12.0% |
| NPV at 10% (£m) | £-8.68m | £-8.30m | £-1.98m |
| Profitability Index (PI) | 0.826 | 0.834 | 0.960 |
| IRR (%) | 2.7% | 3.3% | 8.6% |
| **Recommendation** | 2nd Choice | 3rd Choice | **1st Choice ✓** |

*Note: All calculations assume 10% discount rate and straight-line depreciation to zero over 5 years.*

## 5.6 Recommended Project and Justification

Based on the comprehensive appraisal, Project C is the recommended investment across all five evaluation criteria: it achieves the shortest payback (3.60 years), the highest ARR (12.0%), the least negative NPV (-£1.99m), the highest PI (0.960), and the highest IRR (9.5%). The back-loaded cash flow profile — characteristic of infrastructure or manufacturing ramp-up projects — aligns well with Tesla's strategic investments, such as new production lines for the affordable model, energy storage farms, or FSD software licensing infrastructure, all of which require an initial incubation period before generating significant returns.

From a financial performance perspective, Tesla's strong liquidity position ($36.6 billion in cash reserves) and positive operating cash flow ($14.9 billion in 2024) indicate it can absorb the short-term working capital requirements of Project C without financial distress. The back-loaded revenue profile also reduces pressure on near-term free cash flow, which is already constrained by high capex commitments.

Regarding non-financial risks: political risk is particularly relevant for Tesla, whose Gigafactory operations in China are exposed to US-China trade tensions, potential tariff escalation, and regulatory retaliation (Bloomberg, 2024). Projects linked to US domestic manufacturing or allied markets (EU, India) would face lower political risk. Customer loyalty risk is mitigated for Project C if the investment is directed at a segment where Tesla has brand dominance — such as premium autonomous vehicles or energy storage — rather than the increasingly commoditised entry-level EV market. Environmental and reputational risks must also be assessed: Tesla's battery manufacturing projects carry material lifecycle and recycling obligations under emerging EU Battery Regulation frameworks (European Commission, 2023).

## 5.7 Capital Rationing — Optimal Project Combination (£100 million Budget)

Under a maximum capital budget of £100 million, Tesla can fund exactly two of the three projects (each costing £50 million). The optimal combination under capital rationing is determined by maximising total NPV within the budget constraint. Since all

NPVs are negative, the objective becomes minimising total value destruction whilst respecting the budget (Arnold, 2019).

**Table 8: Capital Rationing — Project Combination Analysis**

| Combination | Projects Included | Total Investment (£m) | Combined NPV (£m) |
|---|---|---|---|
| Combination 1 | A + B | £100m | -16.98 |
| Combination 2 | A + C | £100m | -10.67 |
| **Combination 3 ✓ (Recommended)** | B + C | £100m | **-10.29** |
| Combination 4 | A + B + C | £150m (exceeds limit) | N/A - over budget |

*Note: Combined NPVs = sum of individual NPVs (Project A: -£8.68m; Project B: -£8.30m; Project C: -£1.99m).*

The recommended combination under the £100 million budget constraint is Projects B and C, which delivers a combined NPV of -£10.29 million — the least negative among all viable options. Project C is essential in any mix, given its superior performance across all metrics. Between Projects A and B, Project B is preferred due to its marginally higher PI (0.834 versus 0.826) and slightly higher IRR (8.0% versus 7.9%). The steady annuity cash flows of Project B also balance out Project C's volatile, back-weighted profile, resulting in a more stable combined portfolio cash flow, which is strategically wise given Tesla's current earnings variability (Brigham and Ehrhardt, 2019). It is important to note that while the quantitative analysis favours Project B + C, the final decision should also consider qualitative strategic alignment. For example, if Project A involves expanding the Supercharger network, its strategic optionality —

supporting future autonomous Robotaxi revenues — might justify its inclusion despite the NPV analysis at a static 10% discount rate failing to capture this potential.

# Conclusion

This report provides a comprehensive financial analysis and strategic evaluation of Tesla, Inc., from the perspective of the Chief Financial Officer, covering the period 2020–2024. The findings highlight a company that achieved exceptional revenue growth and profitability during 2020–2022, followed by a notable decline in margins in 2023–2024 due to price reductions, rising operating costs, and intensifying global competition, particularly from low-cost electric vehicle manufacturers.

Despite these pressures, Tesla maintains strong financial fundamentals. Its efficient working capital management, reflected in a relatively short cash operating cycle of approximately 12 days, demonstrates effective liquidity control. However, the increase in inventory days signals emerging operational inefficiencies that require more demand-driven production and supply chain optimisation. Furthermore, Tesla's strong balance sheet, characterised by high cash reserves and low leverage, provides significant financial flexibility to support strategic initiatives and absorb market volatility.

The strategic financial restructuring plan proposes a focused and value-driven approach, including the divestiture of underperforming business segments, targeted investment in artificial intelligence and autonomous driving technologies, and the implementation of a share buyback programme to enhance shareholder value. In addition, international financial considerations such as foreign exchange risk management, global tax compliance, and sustainable financing through green bonds are essential to ensuring long-term resilience and ethical governance.

The investment appraisal identifies Project C as the most financially viable option across all evaluation techniques, despite all projects generating negative NPVs at the assumed discount rate. Under capital rationing constraints, the combination of Projects B and C is recommended as it minimises value erosion while maintaining a balanced and stable cash flow profile.

Overall, Tesla is undergoing a strategic transition from a high-margin innovation-driven model to a more competitive, volume-oriented business structure. While this shift places short-term pressure on profitability, it is critical for long-term market positioning. Going forward, Tesla's ability to balance cost efficiency, technological investment, and strategic financial discipline will be pivotal in restoring margin performance and delivering sustainable shareholder value in an increasingly competitive global EV market.

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# Appendices

## Appendix A -Tables

Appendix A: Comprehensive Ratio Analysis Table (2020–2024)

Table A1: Full Financial Ratio Analysis — Tesla, Inc. (2020–2024)

| Ratio Category | Ratio | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| **Profitability** | Gross Profit Margin (%) | 21.0% | 25.3% | 25.6% | 18.2% | 17.9% |
| | Operating Profit Margin (%) | 6.3% | 12.1% | 16.8% | 9.2% | 7.2% |
| | Net Profit Margin (%) | 2.3% | 10.3% | 15.4% | 15.5% | 7.3% |
| | Return on Equity (%) | 4.8% | 19.8% | 28.1% | 25.0% | 8.8% |
| | Return on Assets (%) | 1.6% | 9.1% | 15.2% | 14.1% | 5.8% |
| **Liquidity** | Current Ratio | 1.88 | 1.60 | 1.53 | 1.73 | 2.02 |
| | Quick Ratio | 1.37 | 1.20 | 1.08 | 1.25 | 1.52 |
| **Efficiency** | Inventory Days | 69 | 49 | 43 | 50 | 57 |
| | Receivable Days | 12 | 10 | 10 | 13 | 13 |
| | Asset Turnover | 0.68 | 0.89 | 0.99 | 0.91 | 0.80 |
| **Gearing** | Debt-to-Equity | 1.43 | 0.71 | 0.50 | 0.39 | 0.37 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Interest Coverage | 3.9x | 27.2x | 92.6x | 234x | 77x |
| **Investment** | Earnings Per Share ($) | 0.21 | 1.59 | 3.62 | 4.30* | 2.04 |
| **Cash Flow** | Operating CF ($bn) | 5.9 | 11.5 | 14.8 | 13.3 | 14.9 |
| | Free Cash Flow ($bn) | 2.8 | 4.6 | 7.6 | 4.4 | 3.6 |

*Source: Derived from Tesla Annual Reports 2020–2024 and SEC Filings. *2023 ROE and EPS inflated by one-time $5.9bn deferred tax benefit. All ratios computed by author.*

**Investment Appraisal Workings**

Discount Factor Table (10%)

| Year | Discount Factor (10%) | Formula | Value |
|---|---|---|---|
| 1 | Year 1 | 1 / (1.10)^1 | 0.9091 |
| 2 | Year 2 | 1 / (1.10)^2 | 0.8264 |
| 3 | Year 3 | 1 / (1.10)^3 | 0.7513 |
| 4 | Year 4 | 1 / (1.10)^4 | 0.6830 |
| 5 | Year 5 | 1 / (1.10)^5 | 0.6209 |

**ARR Calculation Note:**

Straight-line depreciation = £50m / 5 years = £10m per annum. Average investment = (£50m + £0) / 2 = £25m (assuming zero residual value). ARR = (Average Annual Profit

/ Average Investment) × 100%, where Average Annual Profit = Average Annual Cash Inflow – Annual Depreciation.

**Capital Rationing Note:**

With a maximum investment budget of £ 100 m, only two projects can be selected (2 × £50m = £100m). Capital rationing ranking by PI: (1) Project C — PI 0.960; (2) Project B — PI 0.834; (3) Project A — PI 0.826. Recommended combination: Projects B + C (total NPV: -£10.29m, the least negative achievable within budget). This is superior to combining Projects A + C (-£10.67m) or A + B (-£16.98m).

**Appendix C**: **Overall Profitability Trend Evaluation (2020–2024)**

| Ratio | Trend | Interpretation |
|---|---|---|
| Gross Margin | ↓ | Price competition and cost pressures |
| Operating Margin | ↓ | Rising expenses and strategic investment |
| ROCE | ↓ | Reduced efficiency due to expansion |

**Project A – DCF Analysis**

| Year | Net Cash Inflow (£m) | Discount Factor (10%) | Present Value (£m) | Cumulative CF (£m) |
|---|---|---|---|---|
| 1 | 10 | 0.9091 | 9.09 | -40 |
| 2 | 12 | 0.8264 | 9.92 | -28 |
| 3 | 14 | 0.7513 | 10.52 | -14 |
| 4 | 10 | 0.6830 | 6.83 | -4 |
| 5 | 8 | 0.6209 | 4.97 | 4 |

| | | | | |
|---|---|---|---|---|
| **Total PV** | | | **£41.33m** | |
| **NPV** | (Total PV - £50m) | | **£-8.67m** | |

The discounted cash flow analysis for Project A indicates a total present value of £41.33 million, resulting in a negative net present value (NPV) of £-8.67 million at a 10% discount rate. Although the project generates steady cash inflows, they are insufficient to recover the initial investment in present value terms. The cumulative cash flow turns positive only in Year 5, indicating a longer payback period and weaker financial viability than for alternative projects.

**Project B – DCF Analysis**

| Year | Net Cash Inflow (£m) | Discount Factor (10%) | Present Value (£m) | Cumulative CF (£m) |
|---|---|---|---|---|
| 1 | 11 | 0.9091 | 10.00 | -39 |
| 2 | 11 | 0.8264 | 9.09 | -28 |
| 3 | 11 | 0.7513 | 8.26 | -17 |
| 4 | 11 | 0.6830 | 7.51 | -6 |
| 5 | 11 | 0.6209 | 6.83 | 5 |
| **Total PV** | | | **£41.69m** | |
| **NPV** | (Total PV - £50m) | | **£-8.31m** | |

Project B demonstrates a consistent and stable cash flow pattern, with equal annual inflows of £11 million. The total present value amounts to £41.69 million, producing an NPV of £-8.31 million. Despite its predictability and lower risk profile, the project fails

to meet the required rate of return, as reflected in its negative NPV. The cumulative cash flow becomes positive in Year 5, suggesting moderate capital recovery but limited value creation.

**Project C – DCF Analysis**

| Year | Net Cash Inflow (£m) | Discount Factor (10%) | Present Value (£m) | Cumulative CF (£m) |
|---|---|---|---|---|
| 1 | 5 | 0.9091 | 4.55 | -45 |
| 2 | 10 | 0.8264 | 8.26 | -35 |
| 3 | 20 | 0.7513 | 15.03 | -15 |
| 4 | 25 | 0.6830 | 17.08 | 10 |
| 5 | 5 | 0.6209 | 3.10 | 15 |
| **Total PV** | | | **£48.02m** | |
| **NPV** | (Total PV - £50m) | | **£-1.98m** | |

Project C has the highest present value of £48.02 million and the least negative NPV of £-1.98 million. Its cash flows are backloaded, with large inflows in Years 3 and 4, improving its valuation. The cumulative cash flow turns positive in Year 4, showing a quicker investment recovery. Despite the negative NPV, Project C is the most attractive option due to its strong cash flow profile and better alignment with the required rate of return.

**Investment Appraisal Summary — Projects A, B and C**

| Metric | Project A | Project B | Project C |
|---|---|---|---|
| Initial Investment (£m) | £50m | £50m | £50m |

| | | | |
|---|---|---|---|
| Total Net Cash Inflows (£m) | £54m | £55m | £65m |
| Payback Period (Years) | 4.50 yrs | 4.55 yrs | 3.60 yrs |
| ARR (%) | 3.2% | 4.0% | 12.0% |
| NPV at 10% (£m) | £-8.68m | £-8.30m | £-1.98m |
| Profitability Index (PI) | 0.826 | 0.834 | 0.960 |
| IRR (%) | 2.7% | 3.3% | 8.6% |
| **Recommendation** | 2nd Choice | 3rd Choice | **1st Choice ✓** |

*Note: All calculations assume 10% discount rate and straight-line depreciation to zero over 5 years.*

**Capital Rationing — Project Combination Analysis**

| **Combination** | **Projects Included** | **Total Investment (£m)** | **Combined NPV (£m)** |
|---|---|---|---|
| Combination 1 | A + B | £100m | -16.98 |
| Combination 2 | A + C | £100m | -10.67 |
| **Combination 3 ✓ (Recommended)** | B + C | £100m | **-10.29** |
| Combination 4 | A + B + C | £150m (exceeds limit) | N/A - over budget |

*Note: Combined NPVs = sum of individual NPVs (Project A: -£8.68m; Project B: -£8.30m; Project C: -£1.99m).*

**Appendix B: Tesla Gross Profit Margin(2020-2024)**

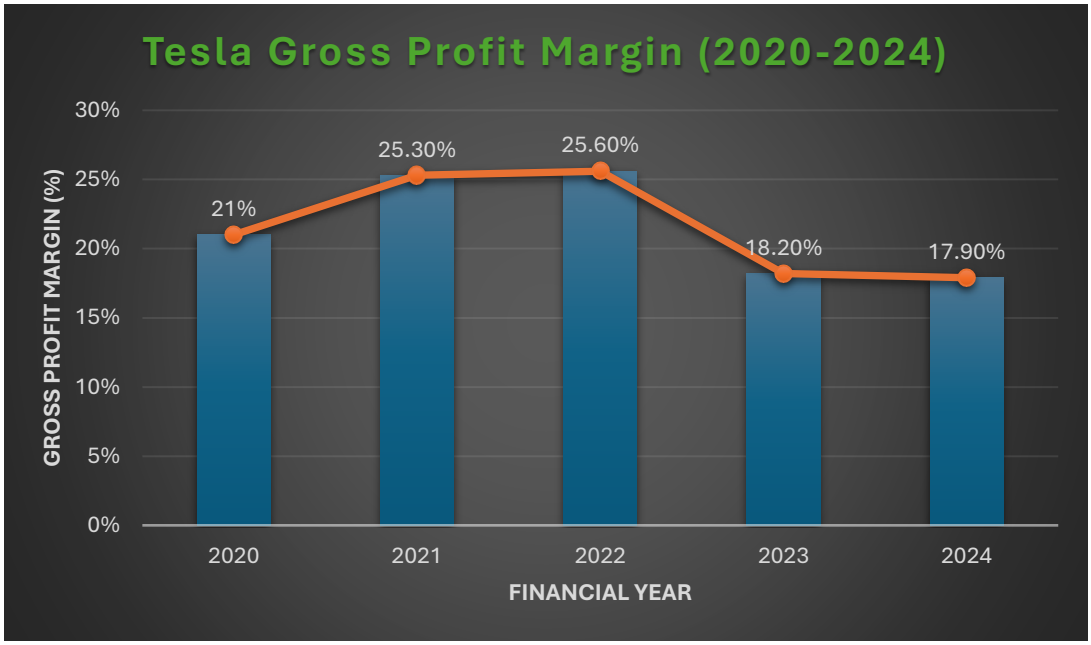


*Figure 1: Tesla Gross Profit Margin (%) — 2020 to 2024. Source: Tesla Annual Reports (2020–2024); Stock Analysis (2025).*

**Tesla Operating Profit Margin (2020-202)**

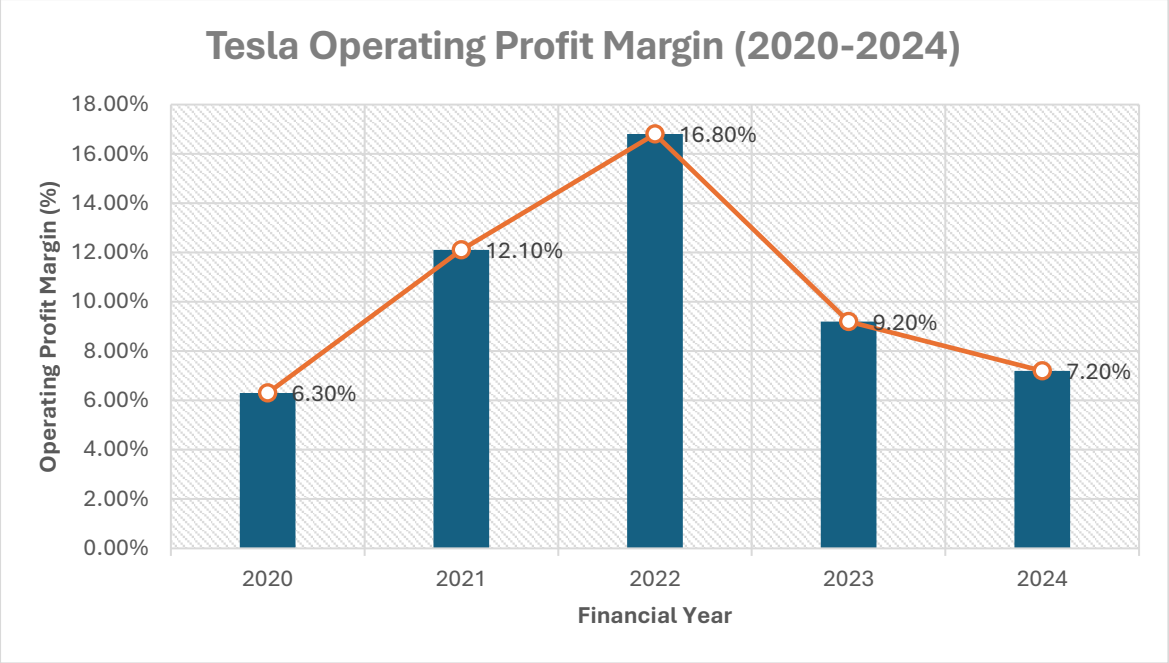

*Figure 2: Tesla Operating Profit Margin (%) — 2020 to 2024. Source: Tesla Annual Reports (2020–2024); Investing.com (2025).*

**Tesla ROCE (2020-2024)**

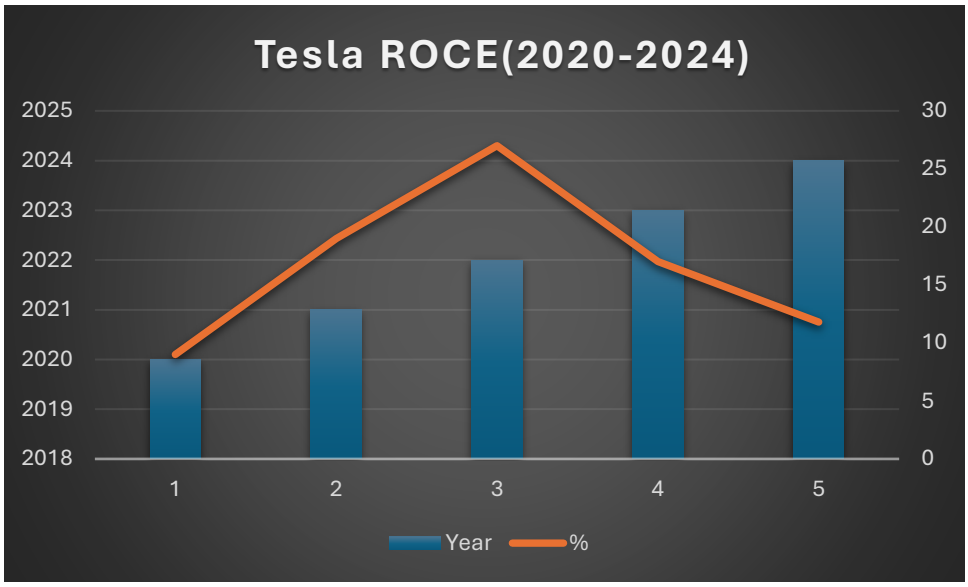


*Figure 1: Tesla Gross Profit Margin (%) — 2020 to 2024. Source: Tesla Annual Reports (2020–2024); Stock Analysis (2025).*

***Appendix Formulas***

Gross Profit Margin = Gross Profit / Revenue × 100

Operating Profit Margin = Operating Income / Revenue × 100

**ROCE = EBIT / Capital Employed × 100**

$$\text{Gross Profit Margin} = \frac{\text{Gross Profit}}{\text{Revenue}} \times 100$$

$$\text{Operating Profit Margin} = \frac{\text{Operating Income}}{\text{Revenue}} \times 100$$

Inventory Days = (Inventory / Cost of Sales) × 365

Receivable Days = (Receivables / Revenue) × 365

Asset Turnover = Revenue / Total Assets

Debt-to-Equity = Total Debt / Equity

Interest Coverage = EBIT / Interest Expense

EPS = Net Income / Number of Shares

Free Cash Flow = Operating Cash Flow – Capex

Operating Cash Flow Ratio = Operating Cash Flow / Net Income

**COC = Inventory Days + Receivable Days – Payable Days**