



# Business Model Comparison between Tesla and BYD: From Supply Chain Integration to Core Technology Competition

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**Abstract.** The electric vehicle industry has grown rapidly in recent years, becoming a major area of innovation and investment. Within this sector, Tesla and BYD have emerged as two leading companies, each adopting different business models. This paper compares their strategies in two main areas: supply chain integration and core technology development. Using financial reports, industry data, and business model analysis tools, the study examines how each company manages costs, promotes innovation, and positions itself in the market. Tesla focuses on software innovation and premium branding, achieving higher profit margins through features like autonomous driving. In contrast, BYD relies on deep vertical integration, producing batteries and chips in-house to keep costs low and expand production quickly. The results show that both models offer advantages depending on company goals and market conditions. This comparison helps investors and policymakers understand the trade-offs between technological leadership and cost efficiency in the EV industry, and highlights different paths companies can take to remain competitive.

**Keywords:** Business Model, Tesla and BYD, Supply Chain Integration, Core Technology Competition.

## 1 Introduction

Over the past decade, the global electric vehicle (EV) industry has experienced remarkable growth, becoming a key force driving change in the automotive sector. As technological innovation and sustainability concerns continue to evolve, competition within the industry has intensified. Among the key players, Tesla Inc. (Tesla) and BYD Company Limited (BYD) are two leading companies in the EV industry. Tesla's business model emphasizes software-driven innovation and autonomous driving capabilities, while BYD has adopted a deeply vertically integrated production system [1]. This paper compares the business models of Tesla and BYD, focusing on two major aspects: supply chain integration and core technology strategies. The comparison aims to highlight how their respective strategies impact cost control, innovation, and market positioning. By analyzing official financial data, industry reports, and strategic disclosures, this paper provides insights into the competitive advantages of each firm. The findings show

that Tesla's technological innovation and premium branding support higher profit margins, while BYD's cost leadership and production scale ensure rapid market expansion. These differences demonstrate the variety of viable paths within the EV sector and offer important implications for investors and policymakers in terms of strategic decision-making.

This paper focuses on two key areas to compare the selected companies: first, their approaches to supply chain integration, particularly in managing production processes and supplier coordination; second, their core technology strategies, emphasizing the development and deployment of crucial technologies such as battery systems and autonomous driving. These two aspects are central to understanding company's competitive positioning and innovation capabilities in the evolving automotive industry. The research uses case studies and financial data to explore how business strategies affect cost, innovation, and performance. This is helpful for investors and policy makers in the EV field.

## 2 Methodology

This research uses a comparative case study approach, it combines financial data and company case studies to analyze and compare Tesla and BYD.

Primary data sources include corporate financial disclosures, investor relations communications and industry research databases and market intelligence reports.

Among them, the corporate financial disclosures mainly include Official filings such as Tesla's Form 10-K and 10-Q reports submitted to the U.S. Securities and Exchange Commission (SEC), as well as BYD's audited annual and interim reports filed with the Hong Kong Stock Exchange (HKEX) [2]. These documents provide quantitative data on revenue, profitability, R&D expenditures, and production metrics.

Investor Relations Communications mainly include transcripts from quarterly earnings calls, investor day presentations, and letters to shareholders from both Tesla and BYD. These sources help show what the company leaders are planning for the future, how they explain their current performance, and what direction they want the business to take. These materials are important because they connect financial results to real business strategies.

To understand the broader context of the global EV industry, the study also draws on reports from reputable sources such as the International Energy Agency (IEA) and Bloomberg New Energy Finance (BloombergNEF), which provide reliable data on EV sales, battery technologies, and supply chain trends. For analysis, the study employs the Business Model Canvas framework [3, 4]. Alongside a comparative case study approach to evaluate and contrast the strategic models of Tesla and BYD.

### 3 Comparative Analysis

#### 3.1 Supply Chain Strategies and Cost Control: One Major Difference is The Degree of Vertical Integration

It can be seen from Table 1 that BYD makes about 75% of its parts in-house, including batteries, chips, and motors. This lowers costs and helps keep production stable. It also invests in lithium mining to control raw materials [5].

Tesla mostly depends on outside suppliers like Panasonic and CATL for battery cells but builds battery packs itself [6]. It is moving toward more vertical integration with its 4680 battery and Supercharger network [7]. This gives Tesla some control without needing to spend heavily on every part.

**Table 1.** Supply Chain Integration – Tesla vs. BYD.

	<b>BYD</b>	<b>Tesla</b>	<b>Comparison Summary</b>
<b>Vertical Integration Level</b>	~75% in-house manufacturing	Partial integration (battery pack assembly, charging infrastructure)	BYD is significantly more vertically integrated
<b>Key Components Produced In-House</b>	Batteries, semiconductors (e.g., IGBT), electric motors	Battery packs, software, charging infrastructure	BYD produces more core components internally
<b>Battery Strategy</b>	Self-manufactured batteries (Blade Battery)[8]; LFP chemistry	4680 battery R&D; relies on Panasonic, CATL, LG for cells	Tesla innovates but relies more on suppliers
<b>Raw Material Control</b>	Owens stakes in lithium mining & processing	Long-term contracts with material suppliers	BYD has more upstream resource ownership
<b>Supply Chain Resilience</b>	High – fewer external dependencies, stable in crises	Moderate – vulnerable to supplier shortages	BYD more resilient in supply disruptions
<b>Capital Expenditure Burden</b>	High – due to owning end-to-end production facilities	Moderate – balances ownership with strategic outsourcing	Tesla reduces capex by selective integration
<b>Flexibility &amp; Scalability</b>	Less flexible due to asset-heavy model	More flexible in scaling through supplier networks	Tesla has a more scalable, asset-light model
<b>Cost Efficiency</b>	Lower component cost due to internal production	Higher supplier cost but efficiency gains via design & tech	BYD has lower input costs

**Cost Control Strategies.** As shown in Table 2 [7], BYD's in-house manufacturing minimizes supplier mark-ups and enables economies of scale, allowing for more competitive pricing of its electric vehicles. Tesla focuses on maximizing efficiency through innovations like gigacasting (large-scale casting of vehicle body parts) and adaptive software-based solutions during supply shortages, enhancing its operational agility.

**Table 2.** Cost Control Strategy Comparison – BYD vs. Tesla.

Aspect	BYD	Tesla
<b>Manufacturing Model</b>	In-house production of critical components (batteries, chips, etc.)	Gigacasting for large-scale body parts
<b>Cost Reduction</b>	Minimizes supplier mark-ups through vertical integration [7]	Uses automation and software to enhance efficiency and scalability
<b>Economies of Scale</b>	Achieved by producing high volumes of components in-house	Gigafactories and innovative manufacturing processes (e.g., gigacasting)
<b>Supply Chain Resilience</b>	Reduced exposure to global supply chain disruptions	Adaptive software solutions during supply shortages
<b>Pricing Strategy</b>	Competitive pricing driven by cost control and large production scale	Premium pricing, but offset by software and efficiency innovations

### 3.2 Core Technology Strategies: Batteries, Autonomous Driving, and Chips

Table 3 illustrates the Core Technology Strategies between BYD and Tesla, Tesla leads in autonomy and software, but BYD focuses on cost and in-house control. Tesla builds a tech ecosystem, while BYD ensures manufacturing independence.

**Table 3.** Core Technology Strategies: BYD vs. Tesla.

Technology Area	BYD	Tesla	Comparison Summary
<b>Battery Technology</b>	In-house developed Blade Battery (LFP chemistry) Focus on safety, cost, and energy density; Controls battery R&D, production, and raw material sourcing	Developed 4680 battery cells (nickel-rich); Focus on energy density and faster production; Collaborates with suppliers (Panasonic, CATL, LG) while gradually localizing production	BYD emphasizes safety and cost; Tesla targets performance and scalability
<b>Autonomous Driving</b>	Developing driver-assistance systems (DiPilot); Collaborates with Nvidia for chips;	Proprietary FSD software 错误!未找到引用源。; In-house chip design for FSD computer;	Tesla leads with advanced autonomous systems and AI infrastructure

Technology Area	BYD	Tesla	Comparison Summary
<b>Chip Development</b>	Autonomous tech is still in early deployment Produces IGBT and power semiconductors in-house; One of the few EV makers with vertical chip capabilities; Focused on efficiency and cost	Data-driven training using Dojo AI supercomputer Designs high-performance AI chips for FSD; Relies on TSMC, Samsung for fabrication; Dojo chip supports machine learning for autonomy	BYD focuses on powertrain efficiency; Tesla invests in AI and custom processors

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#### 4 Business Model Comparison: From EV Product Architecture to Customer Value Delivery

This section examines how both companies structure their product offerings and deliver value to customers using the Business Model Canvas framework [3], and it will be shown in Table 4.

**Table 4.** Business Model Canvas: Tesla vs. BYD.

BMC Element	Tesla	BYD
<b>Customer Segments</b>	Tech enthusiasts, premium/luxury EV buyers; Expanding into mid-market globally (NA, EU, Asia).	Price-sensitive consumers, middle-class families; Fleet customers, public transit authorities; Emerging markets.
<b>Value Proposition</b>	High-tech EVs with smart features (e.g., Autopilot, OTA updates); Stylish design, performance, sustainability focus.	Affordable, safe, and reliable EVs for all; In-house Blade Battery tech; Wide range: economy to commercial EVs.
<b>Channels</b>	Direct-to-consumer via online and showrooms; No third-party dealerships.	Traditional dealership network; Increasing use of e-commerce and online sales platforms.
<b>Customer Relationships</b>	Digital engagement (app, social media);	Dealer and service center-based interaction;

<b>BMC Element</b>	<b>Tesla</b>	<b>BYD</b>
<b>Revenue Streams</b>	OTA software updates for continuous improvement; EV sales; FSD software & upgrades; Energy products (Powerwall, solar) [9]; Regulatory credits.	Localized marketing and community events. BEVs, PHEVs, buses, taxis, trucks; Battery tech & components; Government contracts & subsidies.
<b>Key Resources</b>	Proprietary FSD software & AI; Gigafactories worldwide; Supercharger network; Tesla brand equity.	End-to-end control of supply chain; Blade Battery, IGBT chips; Government support and land-use agreements.
<b>Key Activities</b>	R&D (batteries, software, autonomy); Gigacasting and factory automation; Charging network expansion.	Full-stack manufacturing; Fast product iterations; Supply chain management (raw materials to vehicle delivery).
<b>Key Partnerships</b>	Panasonic, LG Chem, CATL (batteries); Samsung, TSMC (chips); Infrastructure partnerships for Superchargers.	Toyota (EV JV), Daimler (Denza), Nvidia (autonomy); Fleet & government collaborations.
<b>Cost Structure</b>	High R&D & capex; Lower marketing cost via direct model; Savings from vertical automation.	High fixed cost from vertical integration; Lower component cost via self-production; Volume-driven efficiencies.

## 5 Financial Analysis

This section examines the financial performance of Tesla and BYD, focusing on five key indicators: Revenue, Revenue Growth Rate, Gross Profit Margin, Net Profit, and Net Profit Margin. The data for these indicators are derived directly from the companies' official financial statements for fiscal year 2024. This analysis explores how each company's strategic approach is reflected in these financial outcomes, highlighting the differences in their business models and operational focus.

**Table 5.** Financial Comparison: BYD vs. Tesla in 2024.

<b>Indicator</b>	<b>Tesla</b>	<b>BYD</b>	<b>Notes</b>
<b>Revenue</b>	\$97.69 billion	\$107.10 billion	BYD leads in total revenue
<b>Revenue Growth Rate</b>	1%	29%	BYD growing significantly faster

Indicator	Tesla	BYD	Notes
Gross Profit Margin	17.9%	19.4%	BYD benefits from vertical integration
Net Profit	\$7.09 billion	\$5.74 billion	Tesla has higher overall net income
Net Profit Margin	7.3%	5.35%	Tesla outperforms in profitability efficiency

## 5.1 Revenue and Growth

As Table 5 [10] shows, BYD made USD 107.1 billion in revenue [11], slightly more than Tesla's USD 97.69 billion in 2024 [12]. BYD's 29% growth was much higher than Tesla's 1%. This fast growth came from its wide product range and lower prices, helping it grow in China and other countries.

## 5.2 Gross Profit Margin

The Gross Profit Margin reflects how efficiently a company produces its products. BYD's gross profit margin stands at 19.4%, outperforming Tesla's 17.9% in Table 5. This margin superiority underscores BYD's operational advantage derived from its vertically integrated model—manufacturing its own batteries and chips, thus controlling input costs and safeguarding supply chain stability. Tesla, despite its technological sophistication, faces margin pressure from pricing cuts and increased input costs, especially in an environment of heightened global competition.

## 5.3 Net Profit and Net Profit Margin

Tesla reported a net income of 7.09 billion exceeding BYD's 5.74 billion in USD dollars. More notably, Tesla's net profit margin of 7.3% outpaces BYD's 5.35%. This demonstrates Tesla's superior cost discipline and its ability to generate higher earnings per dollar of revenue. Central to this efficiency is Tesla's monetization of high-margin software features, such as FSD software and AI, which contribute positively to its profitability beyond hardware sales.

## 5.4 Structural Determinants of Profitability Disparity Between BYD and Tesla

The difference in profits between BYD and Tesla is mainly caused by their business models and product strategies. In 2024, Tesla made about \$4,583 in profit per car, while BYD only made \$1,400. Tesla sells higher-priced cars and earns extra income from software features like FSD. BYD sells more affordable EVs and hybrids, which lowers its average profit.

Around 18% of Tesla's gross profit comes from software like FSD subscriptions and updates [9]. These services bring high profits. BYD still depends mostly on hardware sales, which limits its margin growth. Tesla also saves on manufacturing costs through gigacasting and local supply networks. This can reduce production costs by 35% per vehicle. BYD produces many different models and has more complex operations, which makes it harder to control costs. Tesla builds its cars in local factories like those in Shanghai and Berlin to avoid tariffs and lower transport costs. BYD is still building

its international factories, which means higher early costs, like in Thailand and Hungary.

In R&D, Tesla spends 4.2% of revenue mainly on software and automation. BYD spends more—about 6.85%—on batteries, motors, and charging systems. These are important for the future, but they raise short-term expenses. Overall, Tesla's focus on premium products and software helps raise profits, while BYD's cost-focused approach supports growth but lowers its margin.

## 6 Conclusions

Tesla and BYD represent two distinct strategic approaches in the EV market. Tesla's strength lies in its software-driven innovation, premium branding, and integrated digital ecosystem, while BYD excels through cost leadership, deep vertical integration, and a diversified product portfolio.

**Investors and Industry Strategists:** Tesla's approach offers high margins and technological leadership, whereas BYD's model supports rapid volume growth and cost efficiency.

**Policy Makers:** Encouraging domestic production and vertical integration can enhance supply chain resilience, as demonstrated by BYD's model.

**Consumers:** The choice between Tesla and BYD involves a trade-off between cutting-edge technological experiences and cost-effective, reliable mobility solutions.

Tesla should continue leveraging its software and network effects while gradually increasing in-house production capabilities to mitigate supply risks.

BYD should invest further in enhancing its software and digital services to close the technology gap with Tesla, while maintaining its volume and cost advantages.

Industry Stakeholders might consider a hybrid approach, integrating technological innovation with efficient manufacturing to ensure sustained competitive advantage in the rapidly evolving EV market.

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