

Analysis of the Investment Value of Contemporary Amperex Technology Co., Limited Based on the Harvard Analysis Framework

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Abstract. As a leading company in the fields of power batteries and energy storage technologies, Contemporary Amperex Technology Co., Limited (CATL)'s financial status and development strategies have attracted significant attention. This paper analyzes CATL's financial situation using the Harvard Analysis Framework. The Harvard Analysis Framework consists of four components: strategic analysis, accounting analysis, financial analysis, and prospective analysis, providing a comprehensive assessment of the enterprise's financial status, market positioning, competitive advantages, and future development potential. The investment value of CATL is analyzed from the four dimensions of strategy, etc. CATL maintains a high market share and profitability through technological iteration, globalized production capacity, and refined operations. However, it also faces challenges such as accounts receivable turnover and ESG compliance costs. This study verifies the adaptability of the framework, providing reference for investors and enterprises. Its development path has become a benchmark in the industry, and in the future, by balancing scale and efficiency, it is expected to lead the industry. Based on the analysis results, this paper puts forward targeted suggestions. While promoting the sound development of CATL, it provides a useful paradigm for financial analysis, prospect prediction, and risk assessment of high - tech enterprises such as power battery companies.

Keywords: Harvard Analysis Framework, Financial Analysis, CATL, Carbon Neutrality.

1. Introduction

Against the backdrop of the in - depth advancement of the global carbon - neutrality strategy and the accelerated transformation of the energy structure, the power battery industry, as the core of new - energy vehicles and energy storage systems, is undergoing a dual transformation of technological iteration deepening and market pattern reshaping. The strengthening of emission - reduction policies in various countries and the upgrading of consumer demand jointly drive the continuous expansion of the industry's scale. However, this also intensifies the competitive pressure on enterprises in terms of R & D investment, production capacity layout, and supply - chain management. The capital market's attention and participation in the power - battery industry have been continuously

increasing, with a large number of relevant investment research in both the primary and secondary markets converging on this industry.

Traditional financial analysis has evolved from single - indicator analysis to comprehensive financial analysis. DuPont established the DuPont analysis method, taking the return on equity, the most comprehensive financial indicator, as the core, and analyzing the core factors affecting finances by integrating the three major financial statements [1]. Hanlon and Peasnell proposed Economic Value Added (EVA), which is the residual value after deducting the costs of equity and debt capital from the net operating profit after tax. The EVA evaluation method is more scientific and has become an important supplement to the traditional financial analysis system [2]. In the 21st century, with the development of digital technology, financial analysis has also been supported by new technologies. Nutt, taking a different approach, focused on the strategic perspective and pointed out that financial diagnosis must be carried out from a strategic height to play a role in a company's strategic development [3]. Igor pointed out that the global economy is undergoing a digital transformation, and big data should be applied in financial analysis. Integrating it into the management decision - making system can significantly improve the efficiency of financial analysis [4]. Tomáš and Lucie, taking the manufacturing industry as an example, determined the most suitable asset structure of an enterprise through horizontal and vertical financial analysis and the Altman Z - score model, enabling the enterprise to meet industry standards and enhance its competitiveness [5].

Contemporary Amperex Technology Co., Limited (CATL) is an absolute leader in the global power - battery and energy - storage fields, holding core advantages in technological innovation, production - capacity scale, and global market share. Its development is deeply related to the overall trend of the new - energy vehicle and energy - storage industries. Conducting research on the investment value of CATL can not only help investors deeply understand the investment logic of core assets in the new - energy track but also provide a key reference for the capital market to improve the industry valuation system and gain insights into the development trends of the industrial chain.

The theoretical significance of this study lies in expanding the application boundaries of the Harvard Analysis Framework in the high - tech manufacturing field. By integrating strategic management and financial accounting theories, an investment - value evaluation paradigm suitable for power - battery enterprises is constructed, making up for the deficiency in existing research that pays insufficient attention to the special financial attributes of the industry. At the practical level, the research conclusions can provide investors with a financial analysis tool that can withstand the technological - iteration cycle, help identify the strategic intentions behind the choice of accounting policies, and thus provide a practical research idea for industry analysis.

2. Introduction to the Harvard Analysis Framework

The Harvard Analysis Framework was first systematically proposed by Palepu, Bernard, and Healy [6] and was further refined by Streiner [7]. It is a multi - dimensional analysis paradigm with financial statements as the core medium, integrating the internal and external environment, strategic positioning, and future prospects of an enterprise. Its aim is to break through the limitation of traditional financial analysis that "emphasizes data interpretation while neglecting logical connections", and construct a complete analysis chain of "environment - strategy - accounting - finance - value". With "value assessment" as the ultimate goal, relying on the progressive logic of the four - stage "strategic analysis - accounting analysis - financial analysis - prospective analysis", it enables a systematic judgment of an enterprise's operating performance, risk level, and long - term

value. Its theoretical basis integrates strategic management theories (such as Porter's Five - Force Model, PEST analysis, etc.), accounting information quality theory, and financial valuation theories (such as ratio analysis, discounted cash - flow model), forming an interdisciplinary analysis system.

3. Case Analysis of CATL

3.1. Basic introduction to CATL

CATL was founded in 2011 and is headquartered in Ningde, Fujian. It is a leading enterprise in the global fields of new - energy power batteries and energy - storage systems. Since its establishment, relying on technological innovation and global layout, the company has constructed a full - industrial - chain ecosystem covering power batteries, energy - storage batteries, battery recycling, and new - energy solutions. In terms of industry status, CATL firmly holds a leading position globally. It has ranked first in the global power - battery field for many consecutive years and has also long been at the top in the global energy - storage field, forming a "dual - leading" pattern of "power batteries + energy storage".

3.2. Strategic analysis

3.2.1. Macro - strategic analysis

3.2.1.1. Political factors

As a vital component of the green energy sector, the power battery industry serves as a crucial force in advancing global carbon neutrality and curbing greenhouse gas emissions. Meanwhile, it also constitutes a key link in the new energy industry chain—its development has garnered substantial policy support. However, constrained by the impacts of geopolitics and trade protectionism, as well as increasingly stringent compliance requirements pertaining to safety, environmental protection, and human rights, the development of this industry still faces significant policy restrictions. Power battery-producing countries, with China as the representative, have strengthened macroeconomic policy support for relevant industries; in contrast, European and American countries have tightened requirements on the environmental protection, compliance, and localization of power batteries through initiatives such as the Inflation Reduction Act and the New Battery Law, thereby raising the policy thresholds for Chinese power battery enterprises to enter overseas markets.

3.2.1.2. Economic factors

The development of the power battery industry is deeply embedded in the differentiation and adjustment of the global macroeconomic pattern. The global economy presents a "differentiated recovery" trend, and the policies, inflation, and interest rate environments of different economies jointly shape the development context for the industry (Figure 1):

- The U.S. Federal Reserve's continued interest rate hikes have increased corporate financing costs; however, the new energy sector remains a "safe haven for capital" due to its policy priority.
- Although the inflation rate in the Eurozone exceeded 10% in 2023, driving up energy and raw material prices, this also forced enterprises to accelerate investment in low-carbon technologies to adapt to the "carbon economy".
- China has implemented targeted monetary policies; in 2023, it introduced targeted reserve requirement ratio (RRR) cuts for new energy enterprises, creating a low-cost capital environment for

the industry.

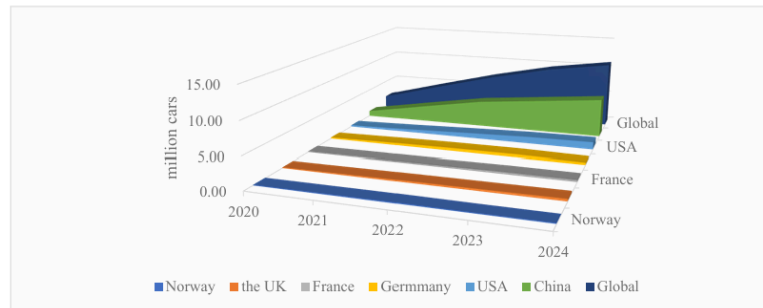


Figure 1. Sales of electric vehicles

On the demand side, the power battery industry is entering a period of explosive growth driven by new energy vehicles (NEVs) and energy storage. The sales volume of NEVs has generally increased across countries, with the expansion of the Chinese market being particularly prominent—making China the main consumer of NEVs globally.

From the perspective of raw material supply, global competition for key resources such as lithium, cobalt, and nickel poses dual challenges to the industry: rising costs and unstable supply. Major producing regions (e.g., Indonesia, Chile) have imposed stricter restrictions on mineral exports, while demand-side enterprises are also engaging in increasingly fierce competition for upstream raw materials.

3.2.1.3. Social factors

From a social perspective, the development of the power battery industry is jointly driven by the transformation of consumer perception, the deepening of environmental awareness, and the upgrading of infrastructure demands—forming a distinct social demand for the industry.

In terms of consumer perception, the concept of green mobility is driving changes in consumption decisions. A younger consumer group is demanding more environmentally friendly products, forcing enterprises to strengthen battery carbon footprint management. Meanwhile, consumers' attention to battery safety and driving range has prompted enterprises to optimize thermal management technologies and improve battery safety.

Environmental protection and circular economy awareness are reshaping the industry's value logic. Under the EU's "Battery Passport" system, 78% of European consumers proactively inquire about battery raw material sources and recycling solutions [8]. In China, the coverage rate of community waste battery recycling bins has increased, and social recycling habits are gradually taking shape.

3.2.1.4. Technological factors

As the core power source of NEVs, the technological development level of power batteries directly determines the performance of the entire vehicle. Its technological R&D focuses on areas such as high safety, high energy density, wide temperature adaptability range, high-rate performance, long lifespan, and low cost [9]. Benefiting from the vigorous development of the new energy industry, a large amount of capital and technology have flowed into the power battery industry, significantly promoting technological progress in related fields. However, inherent technological issues of power

batteries—such as thermal safety problems, swelling issues, and energy conversion efficiency problems—still urgently need to be addressed.

3.2.2. Competitive strategy analysis – based on Porter's five forces model

3.2.2.1. Threat of new entrants

The threat of new entrants in the power battery industry is relatively low:

Technologically, the industry requires long R&D cycles and technology commercialization cycles. Leading enterprises represented by CATL (Contemporary Amperex Technology Co., Limited) hold a monopoly on 29,000 relevant patents and have established mature technical teams, creating significant disadvantages for new entrants.

Capital-wise, power battery production involves high costs, massive capital investment, and prominent economies of scale. Only large-scale enterprises can effectively reduce marginal costs to gain competitive advantages.

Industry data shows that the cumulative market share of new entrants from 2022 to 2024 was less than 3%, which confirms the effectiveness of these entry barriers.

3.2.2.2. Threat of substitutes

The threat of substitutes is weak in the short term but carries certain substitution risks in the medium to long term:

Currently, the price of fuel cell stacks remains relatively high, and the supply pattern of key raw materials is concentrated, leading to significant supply chain risks. Fuel cells are still mainly used for range extension in commercial long-haul vehicles, accounting for less than 1% of the market.

However, there are numerous uncertainties and technological iteration risks in the medium to long term. With innovations in material systems, suppliers of new technologies may gain late-mover advantages, posing a substitution threat to traditional liquid-state batteries.

3.2.2.3. Bargaining power of buyers and bargaining power of suppliers

CATL maintains strong bargaining power over both upstream and downstream sectors. The company enhances its bargaining power with upstream enterprises primarily through multiple strategies—including equity investments in upstream lithium resource and battery material enterprises, long-term supply contract lock-ins, and joint venture establishment—thereby reducing raw material costs.

3.2.2.4. Intensity of rivalry among existing competitors

The power battery industry features intense competition and distinct regional patterns. The top 10 enterprises in terms of global installed capacity account for 90% of the market share, with the top three players—CATL, BYD, and LG Energy Solution—collectively holding 65.7% of the market. This market structure exhibits oligopolistic characteristics.

3.3. Accounting analysis

3.3.1. Inventory

CATL's (Contemporary Amperex Technology Co., Limited) inventory data profoundly reflects the adjustments in its operational strategies amid industry cycle fluctuations and global layout, generally exhibiting characteristics of dynamic balance.

From 2020 to 2022, the skyrocketing lithium ore prices driven by the rising global penetration rate of new energy vehicles (NEVs) led to an increase in the company's inventory book value.

In 2023, as lithium prices plummeted to RMB 100,000 per ton and downstream demand slowed down periodically, CATL implemented strategic destocking. While the inventory scale rebounded, the inventory turnover rate also rose.

3.3.2. Accounts receivable

The overall scale of CATL's accounts receivable shows a characteristic of growing in line with business expansion.

In terms of scale: Accounts receivable increased from USD 1731 million in 2020 to USD 8323 million in 2022, followed by slight adjustments in the subsequent two years. This trend is consistent with the expansion of NEV and energy storage business scales.

In terms of structural proportion:

The "proportion of accounts receivable in current assets" climbed to 14.95% from 2020 to 2022, and then fell back to 12.57% in 2024, reflecting that the occupation of current assets first increased and then gradually optimized.

The "proportion of accounts receivable in operating income" decreased from 22.44% in 2020 to 15.97% in 2023, and then rebounded to 17.72% in 2024. The decline during 2020-2023 indicates that revenue growth outpaced the expansion of accounts receivable; the 2024 rebound is related to the relaxation of credit policies amid industry competition and the upward transmission of financial pressure from downstream NEV enterprises.

3.3.3. Fixed assets

In terms of operational efficiency, the Fixed Asset Turnover (FAT) Ratio rose from 2.56 to 3.47 during 2020-2023, and slightly decreased to 3.22 in 2024.

The earlier growth stemmed from high revenue growth driven by capacity release, which improved asset operational efficiency.

The 2024 decline was attributed to two factors: on the one hand, the slowdown in revenue growth caused by the power battery price war; on the other hand, the still-large fixed asset base (as existing capacity and converted fixed assets from construction in progress need to be digested). However, the overall turnover rate remained at a relatively high level, and coupled with the increase in capacity utilization rate to 76%, this reflects the resilience in the operational efficiency of existing assets.

3.4. Financial analysis

3.4.1. Profitability analysis

Table 1. Profitability indicators of CATL

Year	2020	2021	2022	2023	2024
Sales Net Profit Margin (%)	12.13	13.7	10.18	11.66	14.92
Sales Gross Profit Margin (%)	27.76	26.28	20.25	22.91	24.44
Sales Period Expense Ratio (%)	13.6	11.34	9.37	9.94	7.66
ROE(%)	10.91	21.42	24.68	24.36	22.83

As shown in Table 1, CATL's profitability demonstrates the resilience and optimization trend of an industry leader. From the perspective of core indicators:

- The Gross Profit Margin on Sales hit a low of 20.25% in 2022 and rebounded to 24.44% in 2024. This recovery is driven by the increased proportion of high-margin products—including energy storage batteries and high-end power battery series such as Shenxing and Qilin—which has effectively offset the pressure from the industry price war.

- The Net Profit Margin on Sales fluctuated upward from 12.13% in 2020 to 14.92% in 2024. This growth benefits from two key factors: on the one hand, the economies of scale brought by its leading global market share; on the other hand, the continuous decline in the period expense ratio (from 13.6% to 7.66%), which reflects the company's efficient cost and expense control capabilities.

Despite industry challenges such as price wars and intensified competition, CATL has strengthened its technological barriers through sustained high R&D investment and consolidated its market position by leveraging its global capacity layout. Overall, its profitability has shown an optimization trend amid fluctuations, highlighting the profit stability and growth potential of a leading enterprise in the sector.

3.4.2. Solvency analysis

Table 2. Key solvency indicators of CATL

Year	2020	2021	2022	2023	2024
Debt-to-Asset Ratio (%)	55.82	69.9	70.56	69.34	65.24
Equity Multiplier	2.26	3.32	3.4	3.26	2.88
Current Ratio	2.05	1.19	1.31	1.57	1.61
Quick Ratio	1.78	0.84	0.96	1.36	1.38
Cash Flow Interest Coverage Ratio(%)	2,877.72	3,695.46	2,870.45	2,693.33	2,500.35

As shown in Table 2, the solvency of CATL generally presents a trend of steady improvement with controllable risks.

From the perspective of long-term solvency indicators: After the debt-to-asset ratio exceeded 70% in 2021–2022, it dropped to 65.24% in 2024. Meanwhile, the equity multiplier decreased from 3.4 to 2.88. This reflects that CATL has optimized its capital structure through equity financing, retained earnings, and other means—reducing its reliance on long-term debt and making its financial leverage more reasonable.

In terms of short-term solvency: The current ratio rebounded from 1.19 in 2021 to 1.61 in 2024, and the quick ratio increased from 0.84 to 1.38. Both indicators are above the safety threshold of "1" and have continued to improve, indicating that the coverage capacity of current assets for current liabilities has been enhanced, and short-term liquidity pressure has eased.

Overall, despite the previous increase in debt scale due to capacity expansion, CATL's solvency has improved significantly subsequently through structural optimization and strong support from operating cash flow. Its financial risks remain at a low level, which has solidified the foundation for capital security for the company's sustainable development.

3.4.3. Operating capacity analysis

Table 3. Key operating capacity indicators of CATL

	2020	2021	2022	2023	2024
Total asset turnover ratio (times)	0.39	0.56	0.72	0.61	0.48
Receivable turnover ratio (times)	5.13	7.44	8.04	6.57	5.65
Inventory turnover ratio (times)	2.94	3.6	4.48	5.06	5.2
Fixed asset turnover ratio (times)	2.72	4.28	5.04	3.92	3.18

As shown in Table 3, the operating capacity of CATL (Contemporary Amperex Technology Co., Limited) demonstrates strong resilience in core asset turnover and features dynamic adjustment in line with industry cycles.

- **Total Asset Turnover Ratio:** It gradually increased from 0.39 times in 2020 to 0.72 times in 2022, reflecting that the company effectively activated its assets through early-stage capacity expansion and global layout (e.g., the construction of European factories). From 2023 to 2024, the ratio fell to 0.61 times and 0.48 times respectively—this was due to the expanded capacity base after capacity expansion and a phased slowdown in revenue growth caused by intensified industry competition. Nevertheless, the ratio remained higher than the 2020 level.

- **Accounts Receivable Turnover Ratio:** It rose from 5.13 times in 2020 to 8.04 times in 2022, reflecting the strengthened management of downstream payment collection. From 2023 to 2024, it declined to 6.57 times and 5.65 times, which was related to the transmission of financial pressure from downstream automobile manufacturers and the company's moderately relaxed credit policies. Overall, the ratio still remained within a healthy range.

In summary, relying on the refined management of core assets such as inventory and fixed assets, CATL's operating capacity has demonstrated the stability and flexibility of a leading enterprise both during periods of industry expansion and adjustment.

4. Prospect analysis

4.1. Industry prospect analysis

The power battery industry is in a critical period of technological breakthroughs and global rule restructuring. ESG ratings are reshaping the industry's development logic and competitive landscape. Driven by the carbon peaking and carbon neutrality goals and the tightening of global green trade rules, ESG directly impacts enterprises' compliance costs, technological routes, and market discourse power.

Environmental Dimension: China's lithium battery carbon footprint accounting system covers over 95% of the industry's carbon emission sources, while the EU's new Battery Regulation ((EU) 2023/1542) has established dual standards. Leading enterprises such as CATL have achieved "low-carbon premiums" by reducing costs and improving recycling rates through technological innovation, whereas technologically backward enterprises face disadvantages from carbon-related costs.

Social Dimension: The Battery Passport—an electronic record system mandated by the EU for traceability—has promoted supply chain transparency. Some Chinese enterprises have realized full-chain traceability of raw materials, but geopolitical factors have complicated evaluation processes. Enterprises need to establish a dual-track mechanism to ensure compliance, while small and medium-sized manufacturers are constrained by insufficient traceability capabilities.

Governance Dimension: Chinese enterprises are deeply involved in formulating Battery Passport standards. Enterprises with high ESG ratings enjoy lower financing costs and higher valuations. Leading firms are increasing R&D investment, while tail-end enterprises miss financing opportunities due to poor governance.

The competitive landscape shows an ESG-based gradient distribution: the first tier occupies over 70% of the global high-end market, the second tier maintains regional market positions, and numerous small and medium-sized enterprises face capacity elimination as they cannot afford ESG transformation costs. In the future, ESG compliance costs will become a "market access ticket," and the integration of technology and ESG will determine enterprise development.

4.2. Enterprise development recommendations

4.2.1. Strengthen accounts receivable management

Establish a hierarchical customer credit system: maintain reasonable credit periods for cash-flow stable leading automakers (e.g., Tesla, Volkswagen) to consolidate cooperation; shorten credit periods or require partial advance payments for cash-strapped small and medium-sized automakers to ease collection pressure. Additionally, introduce financial tools such as accounts receivable securitization and factoring business to convert long-term receivables into cash inflows, reducing capital occupation costs and improving asset liquidity [10]. In overseas market expansion (e.g., Europe, Southeast Asia), launch "order financing" services in cooperation with local financial institutions to shorten payment collection cycles for international customers.

4.2.2. Further optimize supply chain management

Power battery production costs are significantly affected by upstream raw material price fluctuations—CATL recorded RMB 2.07 billion in impairment losses due to raw material price volatility in 2024. Differentiated supply chain management is required for three key minerals: lithium, nickel, and cobalt:

Lithium Resources: Mitigate inventory risks by locking prices via lithium carbonate futures.

Nickel Resources: Focus on localized development in Indonesia, cooperating with local enterprises to exploit nickel-cobalt associated ores and avoid restrictions on raw ore exports.

Cobalt Dependence: Accelerate the iteration of high-nickel low-cobalt and lithium iron phosphate battery technologies to reduce reliance on cobalt.

4.2.3. Enhance fixed asset turnover capacity

Improving CATL's fixed asset turnover ratio requires efforts in three areas: optimizing asset utilization, controlling expansion, and managing overseas costs:

Existing Equipment Utilization: Adjust production line priorities based on downstream demand to revitalize existing assets and increase their revenue contribution.

Expansion Control: Strengthen pre-investment demand forecasting and break-even analysis, and tilt capital expenditures toward technological upgrading and digital transformation.

Overseas Cost Control: Build localized supply chains and improve the turnover efficiency of overseas assets through refined operations to drive overall turnover growth. Improving CATL's fixed asset turnover ratio requires efforts in three areas: optimizing asset utilization, controlling expansion, and managing overseas costs:

- **Existing Equipment Utilization:** Adjust production line priorities based on downstream demand to revitalize existing assets and increase their revenue contribution.

- **Expansion Control:** Strengthen pre-investment demand forecasting and break-even analysis, and tilt capital expenditures toward technological upgrading and digital transformation.

- **Overseas Cost Control:** Build localized supply chains and improve the turnover efficiency of overseas assets through refined operations to drive overall turnover growth.

5. Conclusion

Based on the Harvard Analytical Framework, this study systematically analyzes CATL's investment value from four dimensions—strategy, accounting, finance, and prospects—revealing the competitive advantages and development resilience of this global power battery leader amid industrial transformation. The research finds that CATL maintains high levels of global market share, profitability, and operational efficiency through technological iteration, global capacity layout, and refined operational management. Meanwhile, it faces challenges such as fluctuating accounts receivable turnover efficiency, adjustments to the matching of fixed asset scale and revenue, and rising ESG compliance costs.

From an industry perspective, this study verifies the applicability of the Harvard Analytical Framework in the power battery sector. By linking macro strategies with micro financial data, it provides a vivid reference for investment value analysis in high-tech manufacturing. The conclusions not only offer investors a tool to navigate industry cycles but also provide empirical evidence for enterprises to optimize accounts receivable management, develop differentiated supply chain layouts, and enhance fixed asset efficiency.

Against the backdrop of deepening global new energy transition and ESG becoming an industry access standard, CATL's development path sets a benchmark for the power battery industry: only by building solid barriers through technological innovation, controlling costs via refined operations, and adapting to global rules with ESG capabilities can enterprises maintain a leading position amid the industry trends of low carbonization and globalization. In the future, with the commercialization of solid-state battery technology and the expansion of the energy storage market, CATL is more likely to lead the high-quality development of the global power battery industry if it further balances scale expansion and efficiency improvement.

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