Assessment of Non-Financial and Financial Factors for Pony.ai's Development

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Abstract. This academic paper provides a comprehensive analysis of Pony.ai, a leading autonomous driving technology company in China. The research delves into both non-financial and financial aspects to assess the company's developmental prospects and its impact on the autonomous driving industry. From a non-financial perspective, the analysis covers five key areas: (1) People: Examining the educational backgrounds and work experiences of Pony.ai's key personnel, emphasizing the importance of a skilled team and leadership. (2) Opportunity: Evaluating market demand, competitive advantages, and growth potential within the autonomous driving industry. (3) Context: Considering the macro environment and industry dynamics, including political, economic, social, technological, and legal factors. (4) Deal: Assessing the impact of investments, partnerships, and collaborations on Pony.ai's growth. (5) Risk: Analyzing various risks faced by the company, including financing, regulatory, legal, and technological risks. The financial analysis section utilizes the Harvard Analysis Framework and DuPont Analysis Method to examine Pony.ai's income, balance sheet, cash flow, and equity statement. The research highlights the company's financial performance, profitability, solvency, and reliance on financing. The study concludes that Pony.ai holds a prominent position in the autonomous driving industry but faces challenges related to valuation, financial sustainability, and evolving regulations. Continuous innovation will be crucial as the company navigates the dynamic autonomous driving landscape. This analysis offers valuable insights into Pony.ai's development and the broader industry dynamics, benefiting policymakers and investors in the autonomous driving sector.

Keywords: Pony.ai, autonomous driving, non-financial factors, financial factors, market opportunities.

1. Introduction

1.1. Research Background

In recent years, the advancement of autonomous driving technology in China has been swift and substantial. Commencing from the inception of Robotaxi services in 2019, and culminating in the issuance of the inaugural national qualifications for fully autonomous demonstration operations in cities like Chongqing and Wuhan by August 2022, the industry has witnessed remarkable progress. Presently, the unmanned taxi sector has expanded to an impressive scale of 15.8 billion RMB [1]. Despite the challenges posed by the pandemic, the autonomous driving industry in China persists in its growth and expansion trajectory. Evidently, the autonomous driving industry has become an integral facet of the contemporary technological landscape.

As an emerging industry, the autonomous driving sector possesses distinct characteristics that set it apart from traditional sectors. It is characterized by its high technological intensity, rapid development pace, evolving regulatory framework, and elevated risk profile, which are also common traits shared by nascent technology industries [2]. Analyzing this industry contributes to comprehending the recent developments and prospects of the entire technology sector, especially during the pandemic period.

Among the trailblazing entities in the autonomous driving realm, Pony.ai emerges as a notable contender, dedicating its efforts to pioneering cutting-edge autonomous driving systems. Founded in 2016, Pony.ai's current valuation reaches 8.5 billion USD [3]. Examining its developmental journey,

fundraising endeavors, and projecting its future prospects aids in understanding the evolution and state of the entire autonomous driving industry.

1.2. Analysis Method Introduction

In order to conduct a comprehensive analysis of Pony.ai, this paper analyzes the company's development from both non-financial and financial perspectives, considering factors that influence its growth.

1.2.1 Non-financial factors

To analyze the non-financial factors affecting Pony.ai's development, we have augmented the commonly used POCD analysis by incorporating an analysis of enterprise risks. This modification aligns the analysis framework of this paper more closely with the characteristics of Pony.ai as a technology-intensive enterprise. The following section introduces the analytical elements utilized in this study and the specific perspectives of each element analysis.

People: This factor focuses on the personnel, team, and leadership of the company. People encompass the team's skills, experience, professionalism, and alignment with the company's vision. An exceptional team can drive innovation and execution, laying the foundation for the company's success. People also include the capabilities and decision-making of the leadership, as their choices directly influence the company's strategy, culture, and trajectory. This article primarily focus on evaluating the people element of this company by examining the educational backgrounds and work experiences of key personnel at Pony.ai.

Opportunity: This factor centers on the market, industry, and business opportunities the company faces. Opportunity covers market demand, competitive landscape, potential customers, and future trends. Evaluating opportunities is crucial as it helps determine whether sufficient market demand exists to support the company's product or service and if there is substantial growth potential. We initially analyzed Pony.ai's key products and their competitive advantages within the industry. Subsequently, we examined the alignment between the current demands of the autonomous driving industry for autonomous driving systems and the competitive strengths of Pony.ai's products. Ultimately, based on this alignment, we derived the development opportunities for Pony.ai.

Context: Context considers the macro environment and industry dynamics in which the company operates. This includes political, economic, social, technological, and legal aspects that might impact the company's development and operations. Understanding context aids in considering external influencing factors when making decisions, leading to more forward-looking strategies.

Deal: This factor involves business transactions, partnerships, and investment opportunities related to the company. Deal encompasses the company's financial position, partnerships, acquisitions, or investments. Assessing the impact of deals helps decision-makers understand how to leverage various business opportunities to support the company's growth and development.

Risk: Due to Pony.ai being a technology-intensive enterprise, and considering the developmental stage of the autonomous driving industry in which it operates, analyzing Pony.ai's developmental risks is essential for a better understanding of its development prospects. In this paper, we analyze the developmental risks of Pony.ai as a newly established, non-publicly traded company from four perspectives: financing risk, regulatory risk, legal risk, and technological risk. By examining the risks Pony.ai faces, we can assess its developmental prospects.

1.2.2 Financial factors

In order to investigate the developmental prospects of PonyAI and consequently explore the progress of the autonomous driving industry, this paper, building upon the analysis of various non-financial factors influencing PonyAI's development, further delves into the impact of financial factors on PonyAI's growth. Analyzing the financial factors of a company essentially involves conducting a financial analysis, extracting relevant information about the company's development from its published financial statements.

In the realm of corporate financial analysis, Palepu, Bernard, and Healyvwere the first to integrate strategy, accounting, finance, and prospects, proposing the "Harvard Analysis Framework" as an analytical system [4]. With the evolution of financial practices and the deepening of financial analysis research, financial analysis based on the Harvard Analysis Framework has gained attention among scholars. Moreover, in 1919, the DuPont Corporation in the United States developed the DuPont Analysis Method based on years of financial practice. The essence of DuPont Analysis is to decompose core financial indicators through multiple related indicators to analyze a company's comprehensive financial condition [5].

Building upon various prior theories of corporate financial analysis, this paper begins with the company's fundamental financial statements: balance sheet, income statement, cash flow statement, and equity statement. It analyzes aspects such as efficiency, profitability, investment, and liquidity through these financial reports, ultimately providing a quantitative evaluation of Pony.ai's development.

1.3. Significance of This Study

Pony.ai is a quintessential enterprise within China's autonomous driving industry. By studying Pony.ai's developmental prospects, research can extend to the realm of the autonomous driving industry and, by extension, the broader landscape of China's technology industry. Grounded in this analysis, the government can better regulate and assess China's autonomous driving industry, while investors can benefit from investment insights.

2. Introduction of Pony.ai

Pony.ai is a leading autonomous driving technology company that is revolutionizing the future of transportation with its autonomous driving system. Established in 2016, the company is at the forefront of developing cutting-edge self-driving solutions that aim to transform the way people and goods are moved around the world.

The founders of Pony.ai are Lou Tiancheng and Peng Jun. The company's Chief Advisor is Mr. Yao Qizhi, a Turing Award laureate. Comprising primarily high-caliber technical talents, Pony.ai currently employs 105 staff members as of 2022, positioning it as a medium-sized technology startup company [6]. Having successfully completed Series D financing, the company's overall valuation has reached 8.5 billion USD. There is an intention to go public, though no specific timeline for an initial public offering (IPO) has been announced yet.

Built upon its self-developed autonomous driving system, known as the "virtual driver," PonyAI focuses on three core business segments: autonomous driving ride-hailing services (Robotaxi), autonomous driving trucks (Robotruck), and passenger vehicle intelligent driving solutions (POV) [6]. In terms of autonomous driving ride-hailing services, PonyAI's PonyPilot+ system has been deployed in cities such as Beijing and Shanghai. The company's autonomous ride-hailing service operates at a rate of 2.6 RMB per kilometer. In the Robotruck business segment, vehicles equipped with PonyAI's autonomous driving system can achieve Level 4 autonomous driving functionality on busy highways and expressways. The company has already partnered with China FAW Group and others to develop more advanced truck autonomous driving technologies [7]. In the POV business segment, Pony.ai has introduced three intelligent driving solutions known for their exceptional driving experiences: PonyClassic, PonyPro, and PonyUltra. These offerings provide differentiated reference hardware configurations.

3. Analysis of Non-Financial Factors

3.1. People

Peng Jun, the CEO of Pony.ai, is a graduate of Stanford University and has seven years of work experience at Google. Tiancheng Lou, the CTO of Pony.ai, is a two-time winner of the Google Global

Programming Challenge. Between 70% and 80% of the company's employees are technology and research personnel, with the majority of them hailing from the top five universities in China [8]. Due to the fact that the CEO, CTO, and CFO are all technical professionals, the company's organizational structure is not very optimal. Currently, a significant portion of the funding comes from financing, resulting in a relatively low level of commercialization.

3.2. Opportunity

As one of the core business segments, Robotruck has substantial room for development in the market, and at this stage, the Tier 2 market is willing to invest in it. In 2021, Pony.ai reached a partnership agreement with China FAW Group to develop autonomous driving trucks for the Jiefang and Hongqi series. Furthermore, in 2023, Pony.ai obtained the exclusive "Intelligent Connected Vehicle Unmanned Testing" permit at the municipal level in Shenzhen, officially launching autonomous driving unmanned testing with "driverless seats" in the core areas of Shenzhen [9]. Up to the present, Pony.ai's unmanned testing has accumulated over a million kilometers in mileage, with nearly 200,000 paid ride orders. Despite achieving such a substantial testing mileage, Pony.ai's costs for autonomous driving testing remain high. The reason lies in their use of the Toyota Lexus RX450h as a testing vehicle, with a market price of approximately one hundred thousand US dollars, placing it at the forefront of the industry in terms of testing vehicle costs. As a technology enterprise with existing cash flow that may not sustain the company for more than two years, such significant expenses are bound to impact the company's long-term sustainability.

3.3. Context

Compared to competitors like TuSimple and WeRide in the same industry, Pony.ai has developed the first Level 4 autonomous driving system. Since the entire development process has been completed by Pony.ai, granting them independent intellectual property rights, the company possesses a leading technological position in the industry. However, due to the fact that the autonomous driving industry is still in its early stages, autonomous vehicles are not yet widespread. Coupled with the fact that relevant laws and regulations in the industry are still in the process of being formulated, society remains conservative towards autonomous driving. Consequently, the demand for autonomous vehicles is limited, posing constraints on Pony.ai's growth. Furthermore, all the autonomous driving vehicles currently under collaborative development with car companies have not yet entered mass production, presenting a challenge for Pony.ai's path towards profitability.

3.4. Deal

Pony.ai, due to its founders' high recognition and reputation within the industry, has attracted a lot of capital investment since its establishment. Up to now, Pony.ai has received significant investments from Sequoia Capital, IDG Capital, and DCM Capital. In addition, to address the challenge of mass-producing autonomous vehicles, Pony.ai has also collaborated with Chinese FAW Group and Toyota, among other automotive industry companies, to jointly develop self-driving vehicles. However, despite the substantial capital injection and a valuation of $8.5 billion, there have been concerns about an inflated valuation bubble surrounding the company. Moreover, internal sources have revealed that Pony.ai's CEO, Jun Peng, mentioned in early 2022 that the company's cash flow wouldn't last beyond two years. To maintain its technological leadership in the industry, Pony.ai requires more research and development investment, which implies that the commercialization of their technology remains a challenging issue.

3.5. Risk

This article evaluated the risks faced by Pony.ai and identified some common risks inherent to high-tech enterprises, making it a suitable subject for analysis.

Financing Risk: The main focus of this article is on the financing risks during the pandemic. We aim to characterize the impact of the pandemic on this industry by examining data related to

investments in this sector. We obtained the following data: 101 investment events occurred in 2021, but only 26 have occurred up to now in 2023, indicating a certain level of economic risk [10]. Nevertheless, Pony.ai still strive to expand its revenue and even launched an autonomous vehicle delivery service during the lockdown period.

Regulatory Risk: As an emerging high-tech industry, the autonomous driving sector requires consideration of policy and regulatory impacts. Through the examination of policy release dates, we learned that the government began issuing a series of policies to regulate this industry in April 2022, accompanied by some safety-related industry standards. However, looking at the situation across the entire industry, the regulation of the autonomous driving sector is still in the exploratory stage.

Legal Risk: This article also assesses whether Pony.ai has been involved in any recent legal disputes, particularly in the realm of patents, which is common for high-tech companies. According to our research, Pony.ai owns 161 patents, including 122 active patents, 33 pending patents, and 6 inactive patents. As per our findings, the company has no legal risks in the field of patents.

Technological Risk: Similarly, as a high-tech enterprise, its technological products themselves carry inherent risks. This article primarily analyzes the safety of its autonomous driving system and finds that in 2019, two white hat hackers were able to breach an autonomous Tesla in just a few minutes. This demonstrates the existence of risks associated with such products.

4. Analysis of Financial Factors

4.1. Analysis of Income

According to the income statement, TuSimple's revenue for the second quarter was $2.594 million, compared to $1.482 million in the same period last year, representing a year-on-year growth of 73%. However, this is 26.31% lower than the market's expected $3.52 million. On the profit side, the consistent trend of losses continues. In the second quarter, the company incurred a loss of $111 million, compared to a loss of $121 million in the same period last year, and a loss of $112 million in the previous quarter. As of the end of the quarter, the company had $1.16 billion in cash, a decrease of $81 million compared to the previous quarter.

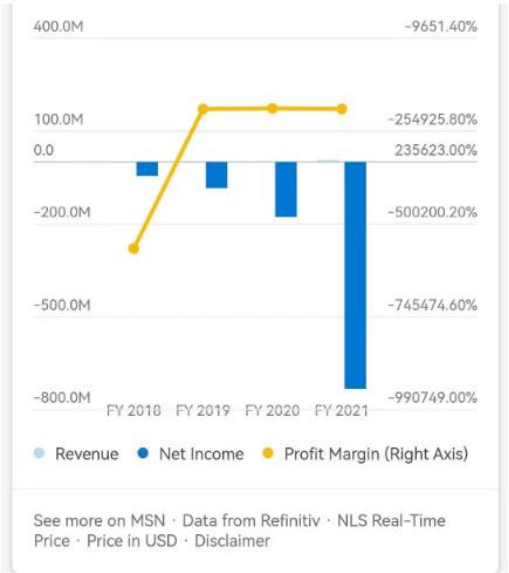


Figure 1. Income statement (Source: https://www.futunn.com/stock/TSP-US/financial/key-indicators)

As the Figure 1 shows, the income statement can be divided into two parts. The blue part represents the company's net profit. We can see that from 2018 to 2021, the net profit for each year remained below the zero line, indicating that the company has been in a loss state. The loss in 2021 exceeded the total loss amount of the previous three years. Calculating the year-on-year loss, we find that the

year-on-year loss increased by 87%, 112%, and 314% from 2019 to 2021, indicating a continuous expansion in the loss magnitude. The yellow curve represents the profit margin curve. Through calculations, we determine that TuSimple's return on investment is -28.06%, which is less than 0.

4.2. Analysis of Balance Sheet

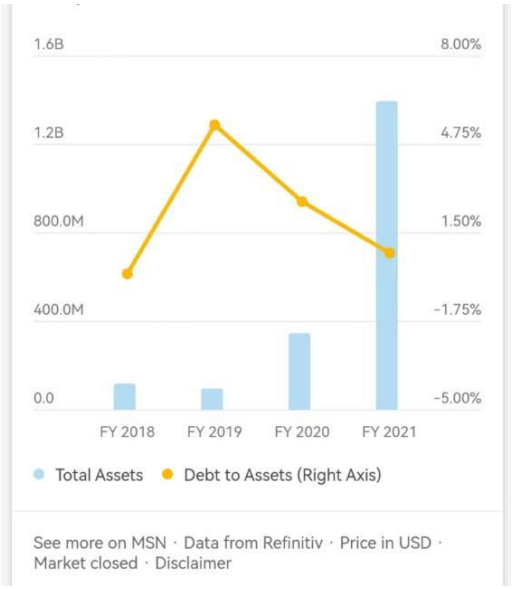


Figure 1. Balance sheet (Source: https://www.futunn.com/stock/TSP-US/financial/key-indicators)

According to the Figure 2, during the period from 2018 to 2019, the gearing ratio increases by 5.47 percentage points, the solvency of the enterprise decreases; during the period from 2019 to 2021, the gearing ratio decreases from 5.47% to 0.77%, a total decrease of 4.7 percentage points, which shows that the solvency of the enterprise has been improved during the two years. This also shows that the financial situation of the enterprise is gradually improving, and the shareholders' equity can be improved, which is conducive to the sustainable development of the enterprise.

4.3. Analysis of Cash Flow Statement



Figure 2. Cash flow (Source: https://www.futunn.com/stock/TSP-US/financial/key-indicators)

From the Figure 3, it can be seen that the investment income decreased from 41.9M to -13.6M, a drop to 55.5M, between 2018 and 2021, and the operating income decreased from -42.8M to -259.0M, a drop to 216.2M, from 2018 to 2021, which is a negative growth trend. Contrary to the investment income and operating income, the financing income rises from 91.7M in 2018 to 1.8B in 2021, which is a positive growth trend with a large growth rate. In summary, combining the above three kinds of

earnings, we can see that the main source of income of the enterprise is financing earnings, from which we can conclude that the enterprise's operating ability and commercial realize ability are weak, and it needs to rely on a large amount of financing to support the enterprise's business operations and scientific and technological research and other activities.

4.4. Analysis of Equity Statement

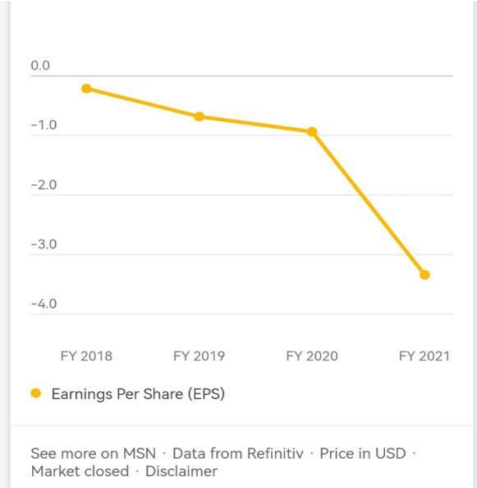


Figure 3. Equity statement (Source: https://www.futunn.com/stock/TSP-US/financial/key-indicators)

According to the Figure 4, between 2018 and 2021, the EPS of the business declines from -0.21 to -3.34, which shows that the profitability of the business is getting worse and there are problems with the way it operates.

5. Conclusion

In conclusion, Pony.ai navigates the complex autonomous driving landscape with its pioneering autonomous driving system. The company's adept team, innovative products, and strategic partnerships fuel its growth in a promising market. However, valuation concerns, financial sustainability, and evolving regulations present challenges. Technological risks are inherent, demanding continuous innovation. Pony.ai's ability to address these challenges will determine its trajectory as the autonomous driving industry matures. This analysis offers insights into Pony.ai's journey and the evolving industry dynamics.

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