

An initial exploration of market dynamics and financial investment strategies in the cultural industries

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Abstract

The current cultural industry is an important driver of economic growth and has received widespread attention and emphasis from countries around the world. According to reports from the World Intellectual Property Organization (WIPO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO), the global cultural industry output has reached 12 trillion US dollars, and has been steadily growing since 2000. In this context, exploring the market dynamics and financial investment strategies of the cultural industry has become a popular and intriguing topic. Although countries have different definitions, names, and scopes for the cultural industries, it can generally be divided into sub-industries such as film, broadcasting, cable, music, publishing, professional sports, performing arts, gambling, online games, theme parks, and fashion and luxury. Regardless of any of these cultural industry sub-industries, the supply and demand relationship is the core of market dynamics and directly affects the direction of cultural industry development and market opportunities. At the same time, financial investment strategies are the basis for investors to make investment decisions, and investment objectives are achieved through optimizing investment portfolios and reducing risks. Therefore, this work attempts to explore the market dynamics and financial investment strategies in the cultural industry. Through market supply and demand factors and general economic principles, it proposes differences

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and suggestions for the market dynamics and financial investment strategies of different cultural industry sub-industries.

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1. Introduction

Economic theory divides markets into perfect competition, monopoly, oligopoly, and monopolistic competition based on how firms price and produce based on external conditions. However, in the cultural industry, there is no perfect competition or free market. For example, professional sports, cable, newspapers and magazines belong to monopolistic markets, while films, music, casinos, and theme parks tend to be oligopolistic markets. Publishing, broadcasting, online games, and performing arts belong to monopolistic competition, as shown in Table 1. Regardless of the economic competition system, the legal system underlying competition, taxation, contracts, and ethics is enormous. For a long time, many cultural industries have also been influenced by government regulations, such as broadcasting, cable television, and gambling. In contrast, policies for film production, distribution, screening, and professional sports aim to remove anti-trust regulations and encourage monopolistic and oligopolistic structures in the market. However, several important general principles in economics, such as marginal issues, differential pricing, public goods attributes, and advertising marketing strategies, are universally applicable to cultural industry analysis. (Cave [6]; Chih-Kai Chen [8,9]; Garnham [14] Hesmondhalgh [15]; Hoskins, C. et al. [16]; Kunzmann [19] Throsby [24]; Vogel [26, 27])

First, marginal issues are suitable for analyzing the supply and demand changes in specific cultural industry products or services over a specific time. Figure 1 is a paradigm model that represents a company's production strategy in pursuit of profit maximization. The intersection in Figure 1(a) represents the optimal production quantity at which the marginal revenue (MR) equals the marginal cost (MC) of the product. The former is the revenue generated by selling one more unit, and the latter is the cost generated by supplying one more unit. The average cost (AC) includes both fixed and variable costs, divided by the total production quantity. The company's profit is the shaded rectangular area, equal to the

price (p) multiplied by the quantity (q), minus the cost (c) multiplied by the quantity (q) (Chih-Kai Chen [8, 9]; Vogel [26, 27]).

Generally, except for exclusive products or brands, there is not much difference between products from different companies. Therefore, companies that pursue maximum profit must strive to shift the market demand curve (D) to the right or make it steeper. The best way is to shift the D curve to the right, indicating an increase in demand at a given price; or to make the D curve steeper, indicating a lower price responsiveness of demand from consumers through advertising or promotions, as shown in Figure 1(b). As long as the company maintains a relatively flat marginal cost curve, it can significantly increase its profits. In addition, the greater the number of substitute products, the greater the price elasticity of demand (Vogel [26, 27]).

Using movies as an example, due to the initial huge investment in production and marketing costs, coupled with uncertain market demand for box office, DVD sales, cable, and other market sizes, the risk probability ranges from zero to infinite. Since the above production and marketing costs are usually prepaid and relatively large compared to other industries, this huge capital that has been invested and assumed to be unrecoverable is called a sunk cost or a fixed cost, representing a cost that has already been paid and cannot be recovered. For example, if a movie ticket has been paid for and cannot be refunded, even if the movie is not watched, the ticket price cannot be recovered, and the movie ticket price is a sunk cost. However, most economists believe that rational decision-makers should not consider sunk costs. For example, if they find that the movie is not good, they should either endure watching it or leave and do something else. Economists usually recommend choosing the latter, at least only losing some money, but at least they can free up time to do other things to reduce opportunity costs.

Regardless, the sunk cost is relatively high and lasts for a long time compared to other input costs (variable and marginal) incurred during the production process. However, for the cultural industry based on intangible assets, once the work is completed, the subsequent increase in production costs for each unit, such as adding a copy of a film, is negligible compared to the sunk cost. Therefore, according to the above general principle, film distributors can shift the market demand curve to the right by investing more in marketing and promotion. Another strategy is to make the demand curve steeper, meaning that the demand price becomes more inelastic. In general, products or services with more inelastic demand prices typically have the following characteristics: they are considered

necessities, have fewer substitutes, have a lower budget share, require shorter consumption time, and are not frequently used. Economists use the concept of elasticity to estimate the percentage of change in price or income that will affect market demand, with the elasticity formula as follows:

$$\epsilon_p = \% \text{ change in quantity demanded} / \% \text{ change in price}$$

When other conditions remain the same, an increase in income or a decrease in price is usually expected to increase market demand. In terms of demand elasticity, assuming that the price rises by 3% and the demand decreases by 6%, the demand price elasticity is -2. As for cross-elasticity between different products or services, it can be a positive value, indicating that they belong to substitutes, such as the films *The Wandering Earth* and *Ad Astra*. It can also be a negative value, indicating that they belong to complements, such as movie tickets and popcorn or hot dogs and soda. As for income elasticity, it can be divided into luxury goods, necessities, and inferior goods. Luxury goods are those where demand also increases when income increases, with income elasticity greater than 1. Necessities are those where the magnitude of the increase in demand is smaller than the magnitude of the increase in income, with income elasticity ranging from 0 to 1. Inferior goods are those where demand actually decreases when income increases, with negative income elasticity. Generally, for most people, most cultural products or services are both necessities and luxury goods (Chih-Kai Chen [8, 9]).

Secondly, price discrimination is used to minimize consumers' surplus and increase corporate profits. In short, product prices can be set between what consumers actually pay and what they are willing to pay, and different product prices can be set when facing different consumer demands. Through the above differential pricing strategy, without incurring additional costs, the additional revenue is equal to the shaded area of the rectangular cross, as shown in Figure 1 (c). Situations where companies can adopt differential pricing include having pricing monopolies, the ability to differentiate consumers with different demand elasticity, and consumers unable to resell products or services.

Using a concert as an example, price discrimination refers to setting different ticket prices for different consumer groups in the same concert. Suppose a singer holds a concert in a venue that can accommodate 10,000 people. The singer's fans can be divided into three categories: A, B, and C. Based on past data, fans in category A are willing to pay the highest ticket price, while fans in category C are willing to pay the lowest ticket price.

Therefore, the concert organizer decides to set the following ticket prices: Fans in category A: 200 yuan per ticket, Fans in category B: 150 yuan per ticket, Fans in category C: 100 yuan per ticket.

Through this price discrimination strategy, the concert organizer can maximize revenue. Because different types of consumers are willing to pay different prices, if ticket prices are unified, it will result in a decrease in category A consumers and an increase in category C consumers, thus reducing total revenue. Setting different ticket prices can allow each consumer to pay the price they are willing to pay, thereby attracting more consumers. The following is the formula for concert price discrimination:

$$\Delta P = (1/\eta) * (\Delta Q/Q)$$

where ΔP is the change in ticket prices, ΔQ is the change in sales volume, Q is the total sales volume, and η is market elasticity (i.e., the degree of change in market demand). This formula shows that if the market elasticity is greater (i.e., demand is more sensitive), changes in ticket prices will have a greater impact on sales volume. Therefore, in a price discrimination strategy, ticket prices should be set based on the demand and payment ability of different consumer groups to maximize revenue.

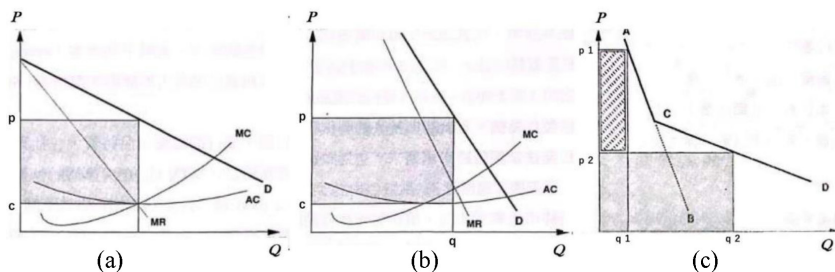
Next, public goods refer to those that can be shared by many people and someone's consumption does not reduce the consumption benefits of others. Examples include defense spending and air pollution reduction programs. Generally, cultural products are intangible and therefore, their consumption does not significantly affect the consumption benefits of others. For instance, lending or sharing films, music albums, game cartridges, or bestselling novels does not affect the viewing or listening experience of others, even though many products are traded as private goods. However, products such as films, music, and broadcasting, theme parks, and sports events have the characteristics of public goods. In summary, public goods represent an increase in one viewer or visitor that cannot measure how much marginal cost has been increased. (Chih-Kai Chen [8, 9]; Vogel [26, 27])

Taking a film as an example, assuming its production cost is \$1 million, if the film is released and each ticket costs \$10, and 100,000 people watch it, the total revenue would be \$1 million, which is private goods. However, if the film is produced by the government or a non-profit organization and viewers can access it through other channels such as public places or online streaming without paying extra fees, it becomes a public good. Therefore, the total public good value of the entire film can

be calculated by assuming that it is played in public places 1 million times and viewed online 10 million times. Assuming that each viewing of the film is valued at \$1, the total public good value of the film is \$11 million (1 million times played in public places + 10 million times viewed online $\times$ \$1/viewing). Therefore, the total social value of the film is the sum of its private good revenue and public good value, which is \$1 million + \$11 million = \$12 million. Overall, the public good value of the film is 91.67% of its total social value (\$11 million / \$12 million), and calculating the public good value in this way helps to understand and showcase the product value of the cultural industry to the public.

Table 1
Market Structure of Cultural Industries

Monopoly Market	Oligopoly Market	Monopolistic Competition
Professional Sports Cable Newspapers Magazines	Theme parks Casinos Film Music	Online games Broadcasting Publishing Performing arts



(a) Optimal production quantity; (b) Shifted demand to the right;
(c) Differential pricing.

Figure 1
Supply Strategy for Maximizing Profit

Finally, advertising is an important marketing strategy, with certain cultural industries often playing the role of ad buyers rather than sellers, such as online games, casinos, and theme parks (Anderson & Scott [1]; Association Casino Australian [2]; Barros [3]; Barros & Alves [4]; Braunlich et al [5]). On the other hand, broadcasting, newspapers, and magazines are typically sellers of advertising. Generally, products or services that

emphasize brand image tend to have a higher advertising-to-sales ratio (A/S). Regardless, advertising is important to both buyers and sellers in the cultural industry. From a demand perspective, advertising can enhance a product's uniqueness and timeliness, and strategies can shift the demand curve to the right or make it steeper, making it less price elastic. From a supply perspective, advertising is equally important to industries that rely on advertising space and airtime for revenue, including broadcasting, cable, and emerging media. For example, these industries often require significant capital and fixed costs during their initial phases. Therefore, even slight changes in advertising demand in the market will immediately reflect on advertising prices and costs, directly affecting revenue and profit. Overall, advertising is increasingly moving towards an integrated direction, incorporating advertising strategies such as licensing (Chih-Kai Chen [7]; Yung-Teen Chiu & Chih-Kai Chen [30]), event sponsorships, tie-ins, or placements, in order to maximize distribution, publishing, and marketing effects by catering to the unique characteristics of different products or services and media platforms (Chih-Kai Chen [8, 9]; Vogel [26, 27]).

Generally, advertising serves the functions of persuasion, information, and complementation. The persuasive function is achieved by reducing the price elasticity of demand for a product or service through advertising, for example by emphasizing that certain products is not to be missed and is highly valuable to possess. Targeted advertising and differential pricing strategies can be used to target specific market segments and increase profits. The informative function involves promoting low-price messages through advertising, which can lead to price wars and be advantageous for new products entering the market. The complementary function increases the demand elasticity of marginal consumers through advertising, thereby creating differentiation from competitors' products and encouraging consumers to switch. In economics, the difference between the expected price and the actual price is called consumer surplus. The formula is as follows:

$$CS = WTP - P$$

Here, CS represents consumer surplus, WTP represents willingness to pay which is the expected price that a consumer is willing to accept, and P represents the actual price paid. Consumers with a smaller or zero surpluses are called marginal consumers, while those with a larger surplus are called intramarginal consumers. Although the cost-effectiveness of

advertising cannot be clearly measured, it is important for both buyers and sellers in the cultural industry.

Advertising is often viewed by newcomers as a market entry barrier, meaning that they must increase their advertising sales ratio to establish the same product awareness and brand image. As for how to measure the best A/S ratio, the most commonly used ratio is the percentage of advertising expenditure to revenue. However, due to differences in market dynamics among different industries, advertising intensity may be more appropriate, meaning the ratio of advertising and price elasticity of demand for different industries is calculated using the formula:

$$kA / S = \epsilon_a / \epsilon_p$$

Where k is a constant, ϵ_a is the demand elasticity of advertising, and ϵ_p is the demand elasticity of price. (Chih-Kai Chen [8, 9]; Vogel [26, 27]) Taking the movie "Joker" as an example for theatrical release, if the total length of the film is 120 minutes and there are 5 commercial advertisements, each with a length of 3 minutes, the ad density of the movie can be calculated. Let kA represent the total length of the commercial advertisements, S represent the total length of the movie, ϵ_a represent the number of commercial advertisements, and ϵ_p represent the movie length divided by the length of a commercial advertisement. Therefore: $kA = 5 \times 3 = 15$ (the total length of commercial advertisements is 15 minutes) $S = 120$ (the total length of the movie is 120 minutes) $\epsilon_a = 5$ (there are 5 commercial advertisements) $\epsilon_p = S / kA = 120 / 15 = 8$ (the movie length divided by the length of a commercial advertisement is 8) By substituting these values, $kA / S = \epsilon_a / \epsilon_p$ can be obtained, which is $15 / 120 = 5 / 8$, or $0.125 = 0.625$. Therefore, the ad density of the movie is 0.125, which means that the proportion of commercial advertisements is 12.5%. However, calculating ad density can assist film companies in assessing the demand elasticity for advertising and pricing, thereby understanding the effectiveness and return on advertising investment under different market conditions.

2. Financial Investment Strategies

As the main assets in the cultural industry are mostly intangible assets or embedded in intellectual property rights, it is crucial for investors to accurately determine the asset values of companies. Generally, asset valuation methods can be divided into three categories: discounted cash flow, comparative, and option methods, and all three methods are usually

applicable. However, sometimes specific industries only apply to specific valuation methods. In any case, discounted cash flow is one of the core concepts, as it takes into account the time value of both profit and risk. (Damodaran [11]; Fernández [13]; Hull [18]; Penman [21]; Pratt, Reilly & Schweih [22]).

Firstly, discounted cash flow mainly measures the expected future income of assets and how a company controls the long-term equity of similar assets. Although discounted cash flow is not the most perfect valuation method, choosing the appropriate discount rate can discount assets into their current value. Generally, the discounted cash flow value of any asset is calculated as the sum of the expected future net present value (NPV), using the following formula:

$$NPV = \sum_{t=1}^n CF^t / (1+r)^t$$

r is the risk-adjusted return rate, which is usually the current interest rate. CF^t is the estimated future cash flow, t is the period, and n is the number of periods in the future where cash flow is received. In short, if the rate of return is 6%, the estimated cash flows for Netflix streaming movies in the next three years are \$6 million, \$4 million, and \$2 million, and there is no value after the third year, then the NPV of the movie is: $6 / (1.0+0.06) + 4 / (1.0+0.06)^2 + 2 / (1.0+0.06)^3 = 5.66 + 3.55 + 1.67 = \10.88 million USD.

Secondly, comparative analysis involves comparing different financial ratios or specific industries and companies. The items compared include cash flow price multiples, revenue, shareholder equity, and profit growth, among others. For example, when comparing global companies that use different accounting standards, the best method is to compare enterprise value (EV) and earnings before interest, taxes, depreciation and amortization (EBITDA). The enterprise value is adjusted for preferred stock and is equal to the outstanding shares multiplied by the stock price, meaning the capitalized value of shareholder equity plus debt minus cash. Cash flow price multiples, revenue, and other financial characteristics already reflect the discounted future cash flows and asset utilization value and level. For example, if a broadcasting system is valued at five times the estimated future cash flow, other broadcasting systems with similar characteristics can also set their prices close to five times. This comparative-multiple approach is often used in asset valuation in the cultural industry, but it cannot fully capture the externalities of the market, meaning certain specific factors may significantly affect asset values for specific buyers, including brand recognition, political potential and moral influence, or

proximity to specific markets, all of which will affect the transaction price of the assets (Pratt, Reilly & Schweih's [22]).

Finally, many cultural assets often exhibit option-like characteristics and infrequent trading, making the use of discounted cash flow or comparables-based valuation less optimal. Instead, option pricing models, such as the Black-Scholes model, can be used for contingent claim valuation, representing a call option on future possible outcomes, where the asset only generates a return under specific conditions and probabilities. Similar assets in the cultural industry, if they have similar option-like contracts, can be valued using this approach, such as intellectual property rights in texts, marketing or distribution contracts, etc. In short, the Black-Scholes model primarily eliminates potential risks by hedging with the underlying asset while taking into account the overpricing or underpricing of options based on their market prices. The theoretical price of an option is calculated as follows:

$$C = SN(d_1) - e^{-rT} LN(d_2)$$

$$\text{Where: } d_1 = [\ln(S/L) + (r + 0.5\sigma^2)T] / [\sigma\sqrt{T}] ; d_2 = d_1 - \sigma\sqrt{T}$$

$\ln$ is the natural logarithm; C is the initial fair value of the asset; L is the delivery price of the asset; S is the spot price of the asset; T is the time to maturity of the asset; r is the risk-free interest rate compounded continuously; σ^2 is the annualized variance; and $N()$ is the cumulative distribution function of the normal distribution variable (Chih-Kai Chen [8, 9]; Hull [18]; Pratt, Reilly & Schweih's [22]; Vogel [26, 27]).

If we take the example of a music digital copyright, let's assume that the current price (S) of Dr. K's music work is \$100, the expected sales and play count (X) within the next year is 1000, the risk-free rate (r) is 5%, the remaining time (t) is 1 year, and the volatility of the music market (σ) is 0.2. Based on this, we can calculate the theoretical price (C) of the music work using the BS model. First,

$$d_1 = [\ln(100/1000) + (0.05 + 0.5 \cdot 0.2^2)1] / [0.2\sqrt{1}] = [\ln(0.1) + (0.05 + 0.50 \cdot 0.04)] / [0.2] \approx 0.6$$

$$d_2 = 0.6 - 0.2\sqrt{1} \approx 0.4$$

$$\text{Therefore, } C = 100N(0.6) - 1000e^{(-0.05 \cdot 1)} \cdot N(0.4)$$

Where $N(d_1)$ and $N(d_2)$ are the values of the standard normal distribution function. However, the actual calculation of the value of music digital copyright may involve more factors and data. The above is just a simple framework to facilitate the evaluation of the value and copyright income of music works.

In addition to the aforementioned financial analysis, the investment performance of the cultural industry is also influenced by many other factors, including currency policies, macroeconomic trends, and psychological factors of investors. The following are some investment evaluation indicators for the cultural industry proposed in this work, including:

Debt-to-equity ratios (DE) measure the ability of various cultural industries to repay debt and are typically measured by estimated cash flow volatility. The lower the cash flow volatility, the higher the level of debt-to-equity ratio. For example, compared to the online games industry, gambling is typically considered to have lower cash flow volatility. As for the film and music industries, they mainly rely on film databases and album catalogs, so their volatility falls somewhere in the middle. (Anderson & Scott [1]; Association Casino Australian [2]; Barros [3]; Barros & Alves [4]; Braunlich et al [5]).

The price to earnings ratio (PE), also known as the P/E ratio, can often obscure a significant amount of useful information when analyzing the value of stocks in different industries. For example, in the case of the film and cable industries, following traditional accounting principles requires predicting expected revenues and confirming syndicate alliance earnings, which can distort the income trend. However, if this indicator must be used, some adjustments in accounting practices are necessary (Chih-Kai Chen [8, 9]; Vogel [26, 27]).

On the other hand, price to sales ratios (PS) are not affected by the above-mentioned income measurement distortion and are therefore widely used in the valuation of common stocks. For evaluating various cultural industry securities, the price/sales ratio divides the price per share by the revenue per share, which may be the most effective strategy for assessing the current situation. If sales for a specific period are adjusted, current sales can be compared to trend levels. For example, in the case of a popular film or online game, sales may temporarily be higher than the trend level, or sales may temporarily be lower due to an economic downturn. Regardless, the price/sales ratio has a close relationship with margin profits.

Enterprise values (EV) measure the number of issued shares, add net debt (total debt minus cash), adjust assets and liabilities off the balance sheet, and then compare the enterprise value with earnings before interest and taxes (EBIT) or earnings before interest, taxes, depreciation and amortization (EBITDA), or other preferred cash flows. Using this indicator allows companies with different capital structures but in the same industry

to be compared on the same basis. In particular, when determining whether a company's stock price is higher than that of its peers in other industries, enterprise value is generally considered more reliable than the price/sales ratio (Leaddeveloper [20]).

Book value (BV) is the shareholder equity in the balance sheet, which is an important evaluation indicator in traditional financial analysis. Similarly, it also plays a significant role in stock price valuation in the cultural industry. For example, some companies may derive their main sources of profit from film databases or album catalogs, and these assets have been fully recorded. Additionally, for real estate, the historical cost of assets such as studio backlots, theme park facilities, and transmission tower sites is often much lower than their current market value. As for intangible assets such as brands and intellectual property rights, they may also have significant value, which has not yet been reflected on the accounting books. (Chih-Kai Chen [8,9]; Vogel [26,27])

3. Conclusion and Discussion

With the advancement of globalization and continuous development of technology, the cultural industry has become an indispensable and important component of the economy in many countries. According to statistical data, as of 2020, the total output value of the global cultural industry has reached \$12 trillion, and it has shown a trend of increasing year by year (WIPO [28]; World Bank [29]). However, the development of the cultural industry also faces many challenges, including intensifying global market competition, constant technological innovation, and intellectual property and copyright protection issues. Therefore, exploring the market dynamics and financial investment strategies of the cultural industry not only helps to grasp the industry's future development trends but also has great significance in assisting companies and investors in formulating effective investment strategies to maximize investment benefits (The National Endowment for the Arts [23]; Cultural industries [10]; Department for Culture, Media & Sport, Creative Industries Division DCMS [12]; House of Lords Library [17]; UNESCO [25]). In this regard, this work proposes several discussions on the market dynamics and financial investment strategies of the cultural industry.

In terms of the external environment, factors such as technology and innovation, policy and regulatory changes, as well as social and governance factors, all have significant impacts on the cultural industry. Firstly, technology and innovation have an increasing impact on the cultural

industry. For example, the application of technologies such as streaming, virtual reality, and artificial intelligence brings new development opportunities to the cultural industry. Investors must pay attention to the impact that technology and innovation may have on the cultural industry, as well as the corresponding investment opportunities and risks that may arise. Secondly, policy and regulations are equally important for the development of the cultural industry and investment strategies. Investors must pay attention to changes in policies and regulations in various countries to formulate corresponding investment strategies for the cultural industry. Finally, issues such as environment, social and governance (ESG) have become increasingly important for investment strategies in various industries, and ESG factors also deserve attention in the cultural industry, particularly in how to formulate corresponding investment strategies to achieve sustainable investment returns.

In terms of market dynamics, as globalization and localization factors always influence the market demand for the cultural industry, there are often significant differences in demand for cultural products and services in different regions. For example, some countries or regions may be more concerned about local culture, while others may prefer globalization. Therefore, investors need to evaluate the impact of local differences on market demand to formulate corresponding local investment strategies. At the same time, consumers' perception and values of cultural products and services also affect market dynamics and investment strategies. Therefore, investors should also pay attention to the psychological and trend changes of consumers in different regions to choose investment products and strategies that meet market demands.

In terms of financial investment, the cultural industry has a certain degree of uncertainty and risk, such as market demand, policies, and technological changes. Therefore, investors must carefully assess the balance between risk and return to decide whether to invest in the cultural industry and how to allocate capital. Additionally, due to the cyclical fluctuations in the cultural industry market, investors need to pay attention to market trends in order to develop corresponding investment strategies and timing to avoid significant losses caused by market volatility. Regarding investment product diversification, since there are always many investment products in the cultural industry market, including stocks, bonds, funds, and derivatives, investors need to choose the investment products that suit them best to achieve a balance between risk and return. Furthermore, corporate governance and transparency in the cultural industry are also focal points that investors should pay attention

to, especially for listed companies. Investors need to evaluate the company's governance structure and profit transparency to reduce investment risks. Finally, there is often intense market competition in the cultural industry market. Therefore, investors should carefully evaluate market competition and develop corresponding investment strategies.

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