Analysis of Celebrity Tax Evasion from Game Theory

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Keywords: Celebrity tax evasion, game theory, implementation of incentives, simplification of tax procedures, enhancement of penalties

Abstract: From the perspective of game theory, this paper analyzes the causes of the messy phenomenon of celebrity tax evasion and proposes measures to solve it. This paper constructs the " auditor-celebrity" game model in the general situation, the situation of celebrity giving bribes and the situation of tax department implementing incentives, analyzes the game model matrix, establishes and parses the game function, and concludes that celebrity tax evasion is the result of the game that celebrity tax evasion cost is too low and the cost of auditing is high. Then, it provides practical and effective policy suggestions for the relevant government departments from the implementation of incentives, simplification of tax procedures, and enhancement of penalties to help realize tax fairness and social stability.

1. Introduction

Recently, a number of celebrities have been implicated in tax evasion cases, once again drawing public attention to the issue. Last year, Deng Lun's case of tax evasion was brought to light, resulting in the tax department reclaiming unpaid taxes along with overdue payments and fining 106 million yuan (Li, 2022) [1]. This marks another instance of a celebrity being fined 100 million yuan for tax evasion, after the cases involving Fan Bingbing and Zheng Shuang. Tax fairness is based on the principle that individuals with varying incomes should pay taxes at different rates. This is supported by *the Personal Income Tax Law*, which establishes progressive tax rates between 3% and 45% for comprehensive income, and between 20% and 40% for labor remuneration income. However, despite their status as public figures, numerous celebrities enjoy significantly high incomes, yet they employ a variety of methods to evade taxes. This practice not only incurs public disapproval but also undermines the fundamental principle of tax equity.

Consequently, the escalation in the number of instances of celebrity tax evasion has prompted the development of more sophisticated evasion strategies. Last year, *the State Administration of Taxation* issued a notice aimed at strengthening tax administration for employees in the cultural and entertainment sector. The notice emphasized the need to improve tax management for celebrities, network anchor agents, brokers, and related producers [4]. *The Criminal Law of the People's Republic of China* now includes provisions that strengthen research and judgment. On 7 May, *the Model Labor Contract for Actors (Trial)* was released by t*he China Federation of Radio and Television Social Organizations* and *the China Network Audiovisual Program Service Association*. The document stipulates that professional income received by public figures, including payment for acting in films,

must not be issued in cash, or disguised as assets such as stocks, property, jewelry, art or collectibles.

This paper establishes the auditor-celebrity game model, constructs the game matrix in the general case, the celebrity bribe case, and the government increases the incentive policy for the tax department case, and lists the function analysis, and finally puts forward the suggestions for the government from the three aspects of increasing the incentive policy, simplifying the tax process, and strictly punishing the mechanism, which is conducive to the tax collection and the stability of the society.

2. Literature review

Research on the collection and management of personal income tax: Chen Yan[2] draws on effective experience from developed countries to propose that personal income tax collection and management for high-income earners may be strengthened from enhancing the tax system, improving the digital level of tax collection and management, bolstering tax payment services and management, and perfecting the punishment mechanism; Wang Jinlan[3] employed game theory to implement appropriate measures for mitigating the negative effects of information asymmetry on personal tax collection and management; Shi Lijuan and Li Miao[4] studied the necessity and feasibility of the paradigm transformation of personal income tax collection and management from the perspective of collaborative governance, and promoted the modernization of the national governance system and governance capacity.

For the literature on the use of game theory to study taxation: Li Fengrong and He Bolin[5] analyzed the factors that affect the implementation of the government's carbon tax policy and the production of low-carbon products by enterprises through game theory and provides a valuable reference for policy formulation; Wang Wensu and Liang Changlai[6] applied game theory to investigate the game subjects and their characteristics in the origin of income tax in the UK to provide valuable insights for China's policymakers to deploy and implement tax reforms; Zhang Tao and Wang Jingjing[7] established a game model between enterprises and tax authorities and the costs and benefits of weakening capital, analyzed the game process and influencing factors of weakening of capital, and put forward the prospect and policy suggestions to prevent weakening of capital.

Referring to the related research mentioned above, this paper limits the main body of the game model to the government and celebrities, specializes in the collection of personal income tax on celebrities, and finally constructs and analyzes the game function and game return matrix between the government and celebrity, it provides solutions to the phenomenon of celebrity tax evasion.

3. Game model building

A game is a process whereby individuals, groups, or organizations choose and implement one or more of their allowed behaviors or strategies under specific rules and conditions, with each achieving corresponding results (Chen,2012)[8]. The Nash equilibrium represents a stable outcome in the game. This article analyses celebrity tax evasion through the lens of game theory.

When collecting personal income tax from celebrities, the main stakeholders are the government and celebrities themselves. The government is responsible for implementing the system, with a focus on promoting compliance with the personal income tax system and adopting measures to ensure that taxes are effectively collected. Celebrities, on the other hand, are obligated to pay personal income tax on their earnings, with tax rates determined by their income level. Due to their high earnings, some celebrities may have a tax burden of up to 40%. (Zhang, 2019)[9] Celebrities frequently employ various tactics, such as opening studios and seeking tax loopholes, to avoid paying taxes. The perspectives of both the government and the celebrities involved in this issue will be analyzed in this paper. The objective of this paper is to elucidate the relationship between the government and celebrities through the establishment of a game model. To achieve this, pertinent parameters will be

set to explain the costs, benefits, and strategic positioning of both parties. Finally, a game function and benefit matrix will be constructed to aid in understanding their relationship.

To aid research, this study is structured as follows: the government's rational person hypothesis is that the personal tax system is promoted to regulate residents' income inequality and to boost revenue (Li, 2020)[10]. The rational person hypothesis for celebrities is that they strive to maximize their economic gain and anticipate receiving the maximum reward with minimal costs, while also requiring governmental recognition to garner more support from the public. In this scenario, celebrities must decide whether to evade paying taxes or not, while the government must determine whether or not to conduct an audit.

Under normal circumstances, for celebrities, if celebrities choose to evade taxes, the best utility that can be obtained without the auditor investigating is N(N>0), which is the amount of underpaid or unpaid taxes. In the case where the auditor investigates, the taxpayer will not only fail to obtain positive benefits, but will also be punished accordingly, and the negative social impact will be detrimental to their career, at which point the negative utility in this case is -M(M>0). If the celebrities choose to pay the tax normally, it will not affect the celebrities regardless of whether the auditor investigates or not, and its utility is 0.

For auditors, if the auditor chooses to investigate, in the case where the celebrities evade taxes, if the auditor is not rewarded for discovering it, the value is negative utility -P (P>0), the magnitude of which can be interpreted as the corresponding cost of hard work. In the case that the celebrities do not evade taxes, the auditor utility of -Q(Q>0, P>Q) is still negative. If the auditor chooses not to investigate, there is no corresponding cost, the utility is 0.

In general, the game model is shown in the following table (Table 1), which is analyzed by the above parameters.

Table 1: General situation of the auditor-celebrity game

celebrity / auditor	evade	not to evade
investigate	(-P, -M)	(-Q, 0)
not to investigate	(0, N)	(0, 0)

At this time, the pure Nash equilibrium of the whole game is (0,N), that is the auditor will choose not to investigate, and the celebrities will choose to evade taxes.

Worse, if there is a situation where a celebrity bribes an auditor, it will make (0,N) become (K,N)(K>0). As shown in Table 2, this will make the entire game more inclined to the direction of celebrities' tax evasion and auditors' non-investigation, which is not conducive to tax collection and social stability. In fact, if a taxpayer has a huge amount of tax evasion, he is more likely to bribe the inspector. In fact, taxpayers are more likely to bribe inspectors if they have huge amount of tax evasion.

Table 2: Bribery situation of the auditor-celebrity game

celebrity / auditor	evade	not to evade
investigate	(-P, -M)	(-Q, 0)
not to investigate	(0, N)	(0, 0)

In response to celebrities' tax evasion, if the government formulates corresponding incentive policies to reward auditors who work rigorously, the original -P (P>0) effect will be turned into a positive effect F(F>0), that is the incentive received by auditors. The game matrix will change, as shown in Table 3.

Table 3: The auditor - celebrity game under government incentives

celebrity / auditor	evade	not to evade
investigate	(P, -M)	(-Q, 0)
not to investigate	(0, N)	(0, 0)

It is clear from the matrix in the table (Table 3) that there is no pure strategy Nash equilibrium solution to the game in this case. Here, we set the probability of tax evasion to, and the probability of not evading tax to $1 - x$; the probability of auditing to y and not auditing to $1 - y$.

From the celebrities' point of view, in order to maximize economic benefits, they must obtain equal utility with and without audit, then appear:

$$x \times F - Q \times (1 - x) = 0 \times X + 0 \times (1 - F) \tag{1}$$

Namely:

$$x = \frac{Q}{F + Q} \tag{2}$$

From the auditor's point of view, in order to maximize its utility, the auditor must benefit equally in both cases where the celebrities choose to evade taxes or not, then appear:

$$(-M) \times y - N \times (1 - y) = 0 \times y + 0 \times (1 - y) \tag{3}$$

Namely:

$$y = \frac{N}{N + M} \tag{4}$$

It is obvious that for celebrities, the magnitude of x depends on F and Q, that is the probability of celebrities choosing to evade taxes mainly depends on the degree of government incentives and audit costs. In order to minimize the probability of celebrity tax evasion, it is necessary to make the value of $\frac{F}{Q}$ as large as possible, which can be achieved by adopting incentives such as a performance system for the tax department and trying to reduce the cost of auditing with the help of technology and streamlining personnel. For the auditor, the size of y depends on M and N, and it is necessary to make the value of $\frac{M}{N}$ as large as possible to increase the probability of the auditor's investigation. N is the amount of tax underpaid or not paid in the case of celebrity tax evasion, which is fixed under certain circumstances, and the degree of reduction can be limited, so that only the strict audit mechanism can increase the difficulty of tax evasion. Therefore, in order to increase the probability of auditing, the punishment for tax evasion and evasion should be greatly increased.

4. Conclusion

Through our analysis of tax evasion behavior, it is apparent that celebrities are more prone to tax evasion due to their high incomes. Additionally, auditors are less likely to investigate strictly due to the associated high costs. This creates an unfavorable situation where taxes are evaded by celebrities and auditors are not investigating. Such a situation is detrimental to tax management, social fairness and stability. The situation could escalate if celebrities offer bribes to auditors for successful tax evasion. However, the relevant departments can significantly mitigate or completely eradicate celebrity tax evasion by taking certain measures. This paper offers recommendations to the

government from three perspectives, namely establishing incentive policies, simplifying tax procedures, and raising penalties.

Firstly, the relevant departments could implement a performance system and other incentive policies to reward auditors for conducting thorough investigations. This would encourage them to maintain the accuracy and completeness of the audit process, despite the significant amount of resources required during rigorous investigations. Moreover, this would further motivate them to perform their duties with diligence because the incentives gained would serve as a positive reinforcement. This strategy can encourage auditors to work with more enthusiasm, significantly elevate the challenge of evading taxes for celebrities, and diminish their "survivorship bias", thereby thwarting potential celebrity tax evasion.

Additionally, the cost of conducting audits can be lowered by simplifying tax procedures or by maximizing the use of high-end technology. The intricacy of government personnel and cumbersome processes may significantly raise tax review expenses. Therefore, optimizing tax processes could enhance efficiency of tax departments and decrease audit costs for personnel. Moreover, big data models are convenient and aid in tax audits, thus the government should employ high-tech solutions to reduce auditing expenses.

Finally, the government should raise tax evasion penalties. This initiative can elevate the opportunity cost of celebrities evading taxes, discouraging them from tax evasion by adopting a result-oriented approach. Consequently, this will reduce the occurrence of celebrities' tax evasion behaviors.

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