Equilibrium pricing strategies for manufacturers and secondary markets with low price preferences

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Abstract*: With the continuous expansion of higher education in China, the waste of textbooks used in higher education institutions is becoming increasingly serious. Due to the inadequate recycling mechanism, the recycling rate of school paper is very low, and countless textbooks are consumed each year. Based on the era background of "Internet plus", based on the strong environmental awareness of college students and their habit of information-based life, the use of Internet technology to promote the recycling of physical books in colleges and universities can effectively avoid the waste of resources, which is conducive to the optimal allocation of resources, saving resources and protecting the environment. We are based on the recycling of old books to trigger a dynamic game between consumers and recyclers, consumers and manufacturers, recyclers and book sellers. Manufacturers with low price preferences and balanced pricing in the secondary market.*
Keywords*: College students; Information market; Second hand books; Low price preference; Game theory*

I.   Introduction

"Ecological civilization construction" has been one of the key tasks emphasized since the 18th National Congress of the Communist Party of China. Nowadays, China has entered a new era of ecological civilization construction. In response to the call of the Party and the country, we college students can start with books around us.

On university campuses, a large number of old books are discarded for nothing every year, while at the same time, the same new books and content flood the market at high prices. The high cost of purchasing books has not only become a financial burden for students, but also a large amount of paper materials has increased the pressure on the country's forest resources, causing serious pollution. Nowadays, the rapid advancement of network technology has brought us into a rapidly developing information society. We can fully utilize the convenience of the internet as a medium to establish physical book recycling and recycling platforms in schools and even between different schools, improve the reuse rate of books, reduce paper waste, and improve the ecological environment. The current industry situation is that it is difficult to find second-hand bookstores near most universities, which has caused great inconvenience for students to choose second-hand books. Second hand bookstores reject elective textbooks, outdated versions, and do not accept "unsold" second-hand textbooks, making it difficult for students to buy the books they want. On the other hand, there is a lack of independent and free trading platforms for second-hand books, which are not combined with network information technology. Students are unable to trade urgently needed books anytime and anywhere, and some unnecessary books are always sold at very low prices. Especially during the graduation season, many students sell teaching books and study guidance books as waste, which is very wasteful. But the second-hand books you want can only be bought at half price or 20% off in second-hand bookstores, especially if you cannot get news that the books have been revised from second-hand bookstores, and the purchased textbooks may not be useful. Compared to overseas, in the United States, most states are responsible for providing teaching materials for college and graduate students. A textbook can be used by different students for many years. In addition, there are companies specialized in textbook recycling and non-profit organizations engaged in book recycling that recycle, organize, process, and recycle textbooks. Recycling is voluntary in the UK, but saving paper and reducing teaching costs has become a tradition. Meanwhile, in the UK, some companies specialize in selling old textbooks to make them easier to recycle. Fifteen years ago, the British Broadcasting Corporation (BBC) launched a competition called "The Return of Textbooks", where hundreds of schools gathered to offer advice on how best to recycle textbooks.

Every year around June, graduating students in China will sell their idle books and other items to younger students at a low price[1][2]. The State Council has put forward the development requirements of "energy conservation" and called for the construction of an energy-saving society, promoting energy conservation and environmental protection. With the continuous improvement of education level and the expansion of enrollment scale in universities in our country, more and more courses are offered to all college students, and the difficulty

of the courses is also increasing. In addition, more and more students are choosing to take the graduate entrance examination after graduation. Therefore, students need more and more textbooks and auxiliary materials in their daily learning and life, but more than half of them fail to effectively handle them after use. Currently, students believe that the textbooks they use are disposable resources with low reuse rates. Due to this phenomenon, students have a large amount of idle timebooks. Many old books will be produced after graduation, which provides us with a great opportunity to promote the reuse of physical books.

Feasibility analysis:

In 2017, the scale of idle goods trading in China reached 500 billion yuan and maintained a growth rate of over 30%. Most transactions of idle items in our country are completed through online second-hand trading platforms. At the same time, the scale of China's book retail market is 80.4 billion yuan, and it continues to grow. According to a survey, 92.3% of college students are willing to choose second-hand books when purchasing textbooks. In addition, most college students do not leave school with too many books upon graduation, so they have to dispose of these books at the price of waste paper or simply throw them away[3][4]. More than 60% of students believe that the existing methods of handling old books cannot meet their needs. At the same time, the reason why most college students give up old books and use new ones is that there is no convenient platform, because obtaining second-hand books requires too much time and effort, rather than being unwilling to use them. The social goal is to achieve resource recovery and explicit knowledge sharing, in order to achieve better social benefits.

Project characteristics. Firstly, we are not limited to recycling old second-hand textbooks. Secondly, before recycling old books, on the one hand, we evaluate the needs of college students and recycle them in a targeted manner; On the other hand, evaluate the existing books in the hands of college students and recycle high-quality books. Once again, regular book donation activities for college students are carried out every year.

Social value, books are different from other objects, they carry knowledge. Knowledge does not depreciate because it is old, and the way we treat old books represents our attitude towards knowledge. In today's advocacy of the spirit of sharing, this project not only recycles these used books, but also collaborates with public welfare organizations to deliver them to those who need them the most and to places where book resources are scarce.

Literature review:

This article is closely related to consumer channel preferences, book recycling and manufacturing processes. Due to the particularity of the research object, firstly, the annual demand for books is basically a linear correlation function of one variable, which means that we can consider the background as a market with slowly expanding market capacity. Secondly, the consumers in this article can act as consumers to purchase new or old books, and can also act as individual sellers to sell old books.

1. Consumer preferences, the State Council has put forward the development requirements of "energy conservation", requiring the construction of an energy-saving society[5], promoting energy conservation and environmental protection, and providing students with a better social background to participate in the recycling of old books. With the continuous improvement of education level and the expansion of enrollment scale in universities in our country, more and more courses are offered to all college students, and the difficulty of the courses is also increasing. Compared to new books, old books are cheaper and students are more willing to participate in the old book cycle. But for new books, old books may have reasons such as being too old or damaged. From the perspective of consumers themselves, both their purchasing power and consumption amount need to be considered. We do not consider the issue of consumer channels here, but focus on the game problem between consumers and two suppliers.

2. For the manufacturing process of books, the manufacturer's cost is the cost of producing books, while the profit generated from printing books remains basically unchanged. For recyclers, the intensity of recycling directly affects the profit of both parties, and the cost of recycling is uncertain, and the selling price is also uncertain. Profit also fluctuates with market fluctuations. The seasonal fluctuations in the second-hand book market only occur during periods such as graduation season and early start of school, when sales are peak, and during the rest of the time, it is basically in the off-season, with fewer students purchasing second-hand textbooks. It is difficult to form a scale for college students to purchase second-hand books mainly through campus second-hand bookstores, online transactions, or private transactions, which makes the competition on second-hand book trading platforms relatively less. Although all universities have second-hand book transactions, due to the lack of enterprises leading the development of the second-hand book market, it is difficult for ordinary universities to form a certain scale of the second-hand book market[6].

II. Model Establishment and Solution

2.1.Parameter Description and Model Assumptions

This article assumes that the entire market is fixed, and new products have a certain depreciation coefficient to affect the price and quality of the products. At the same time, the utility of the new products and the basic efficiency of the products are considered for value assignment. The analysis of consumer demand and different demands is conducted, and the analysis of the primary market and consumers, as well as the analysis of the secondary market and consumers, is used to obtain the required utility and demand functions, and to obtain the profits of the primary and secondary markets, Perform Nash equilibrium analysis to obtain the optimal solution in the equilibrium state, thereby obtaining the optimal function model. Draw the necessary conclusions for this article.

To study the equilibrium pricing model between manufacturers and secondary markets considering low price preferences, this study considers the image of both primary and secondary markets through market price adjustment, product price reduction, and seller reputation[7][8]. It also considers the different profit income of two types of merchants. Primary market merchants directly sell products to customers, enjoying direct market access while bearing the pressure of selling higher priced goods, The secondary market, while enjoying lower prices for goods, has to consider the impact of seller credibility and the price reduction of products in the primary market on the prices of products in the secondary market

This article is based on the study of manufacturers considering low price preferences and the equilibrium pricing model of the secondary market. Therefore, consumers are skeptical about which level of market products they purchase. They may think that products in the primary market are more trustworthy and therefore purchase products in the primary market. They may also choose to enter the secondary market to purchase products due to the lower prices of products in the secondary market, which in turn affects the profits obtained in the secondary market

This section is based on the equilibrium pricing model between manufacturers and the secondary market considering low price preferences[9]. Using the Nash equilibrium game model, it explores the problem of consumers obtaining different profits in the secondary market under the guidance of low price preferences, and makes decisions on profit maximization

The relevant symbols and their meanings in the study are shown in the following table

f	Depreciation coefficient for new products
h	The convenience of new products
b	Basic utility of the product
Q	The highest price that consumers are willing to pay
E	The level of demand for products (whether old or new)
m	The degree of price reduction for first-order products
r	Reputation of Second Order Market Sellers
α	The retention value of the first stage
p_1	Price of primary market products
p_2	Price of secondary market products
q_1	Requirements for the first stage product
q_2	Requirements for the second stage product
c	Consumer preference for low-priced products
c_1	Cost of primary market products
c_2	Cost of secondary market products
π_1	Profit of primary market manufacturers
π_2	Profit of secondary market manufacturers

2.2Demand function

In the above profits, the corresponding overall profit function is

$$C=fb+H-eb-m+r-p_2/p_1+p_2$$

The demand functions of the two markets are:

$$q_1=N(Q-c\,p_1/\alpha-f)$$

$$q_2=(1-N)(e\,q-(1-c)\,p_2/\alpha-f)$$

The optimal equilibrium price selected for the two-level market obtained is:

$$p_1 = \frac{r + (Qf - Q\alpha - 1)p_2 - m + bf - eb + H}{Q\alpha - Qf}$$

$p_2 =$

$$p_2 = \frac{\sqrt{((Q\alpha-Qf)p_2-Qc_1f+Qac_1)r+(Qf-Q\alpha)p_2^2+((Qf-Q\alpha)m-Qbf^2+(Qc_1+(Q\alpha+eQ)b-HQ)f-Qac_1-eQab+HQ\alpha)p_2+(Qc1f-Qac1)m-Qbc1f^2+((Q\alpha+eQ)b-HQ)c_1f+(HQ\alpha-eQ\alpha b)c_1+(Q\alpha-Qf)p_2}}{Qf-Q\alpha}$$

The utility function of consumers in the primary market is:
U1=fb +H-cp1
The utility function of consumers in the secondary market is
U2=eb+m-4+(c-1)p2

When U1>U2, consumers choose to purchase in the primary market, and there areC>fb+H-eb-m+r- $p_2 / p_1 + p_2$ choose to purchase in the primary market.At this point, the demand functions of the primary and secondary markets are

$q_1 =$ N(Q-c p_1 / α -f)

$q_2 =$ (1-N)(e q-(1-c) p_2/α -f)

Substituting c at this point yields

$q_1 =$ N(Q- (fb+H-eb-m+r- $p_2 / p_1 + p_2$) p_1 / α -f)

$q_2 =$ (1-N)(e q-(1- fb+H-eb-m+r- $p_2 / p_1 + p_2$) p_2/α -f)

Derive the profits of the primary and secondary markets separately:

$$\frac{\partial \pi_1}{\partial p_1} = N \cdot (Q - \frac{(r - p_2 - m + bf - eb + H)}{(\alpha - f)(p_1 + p_2)}) + \frac{N \cdot (r - p_2 - m + bf - eb + H)(p_1 - c_1)}{(\alpha - f)(p_1 + p_2)^2}$$

$$\frac{\partial^2 \pi_1}{\partial p_1^2} = \frac{2N \cdot (r - p_2 - m + bf - eb + H)}{(\alpha - f)(p_1 + p_2)^2} - \frac{2N \cdot (r - p_2 - m + bf - eb + H)(p_1 - c_1)}{(\alpha - f)(p_1 + p_2)^3} - \frac{2N \cdot (p_2 + c_1)(r - p_2 - m + bf - eb + H)}{(f - \alpha)(p_1 + p_2)^3}$$

$$\frac{\partial \pi_2}{\partial p_2} = -\frac{(1-N)P_2 \cdot (p_2 - c_2)(r - p_2 - m + bf - eb + H)}{(\alpha - f)(p_2 + p_1)^2} - \frac{(N-1)P_2 \cdot (p_2 - c_2)(r - p_2 - m + bf - eb + H)}{(\alpha - f)(p_2 + p_1)^2}$$

$$\frac{\partial^2 \pi_2}{\partial p_2^2} = \frac{2(N-1)P_2 \cdot (p_2 - c_2)(r - p_2 - m + bf - eb + H)}{(f - \alpha)(p_2 + p_1)^3}$$

There is a second-order derivative<0, indicating that both the secondary market and the primary market have the best pricing
At the same time, the optimal pricing for Nash equilibrium in both markets is

$$p_1 = \frac{r + (Qf - Q\alpha - 1)p_2 - m + bf - eb + H}{Q\alpha - Qf}$$

p_2 =

$$p_2 = \frac{\sqrt{((Q\alpha-Qf)p_2-Qc_1f+Qac_1)r+(Qf-Q\alpha)p_2^2+((Qf-Q\alpha)m-Qbf^2+(Qc_1+(Q\alpha+eQ)b-HQ)f-Qac_1-eQab+HQ\alpha)p_2+(Qc1f-Qac1)m-Qbc1f^2+((Q\alpha+eQ)b-HQ)c_1f+(HQ\alpha-eQ\alpha b)c_1+(Q\alpha-Qf)p_2}}{Qf-Q\alpha}$$

The optimal price of second-generation products and the optimal degree of price reduction for first-generation products are influenced by various factors, including the depreciation coefficient of first-generation products[10], the convenience of purchasing new products, the degree of price reduction for first-generation products, and consumer preference for low prices

III. Conclusion
Consumer's preference for low prices can affect the profits and optimal pricing of the secondary market. In this case, manufacturers can attract more consumers by lowering the prices of products in the secondary market, and can also increase their market share by improving the quality and reputation of products in the

primary market.

The following figure shows when r=0.2 * p_1 The market function graph at 1 o'clock, we discuss here the relationship between r and p, while keeping other factors constant_ When the correlation coefficient of 1 increases[11], it means that the credibility of sellers in the secondary market increases and market profits change.
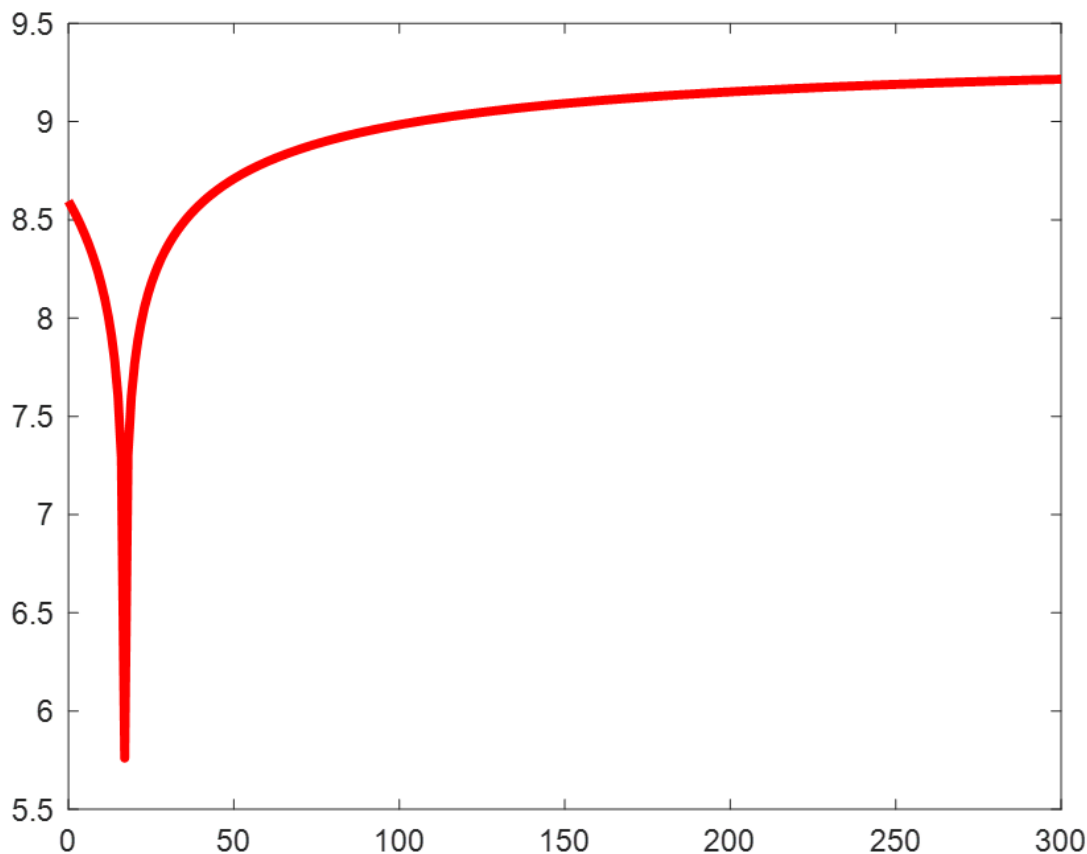
The horizontal axis represents the price of the first stage product
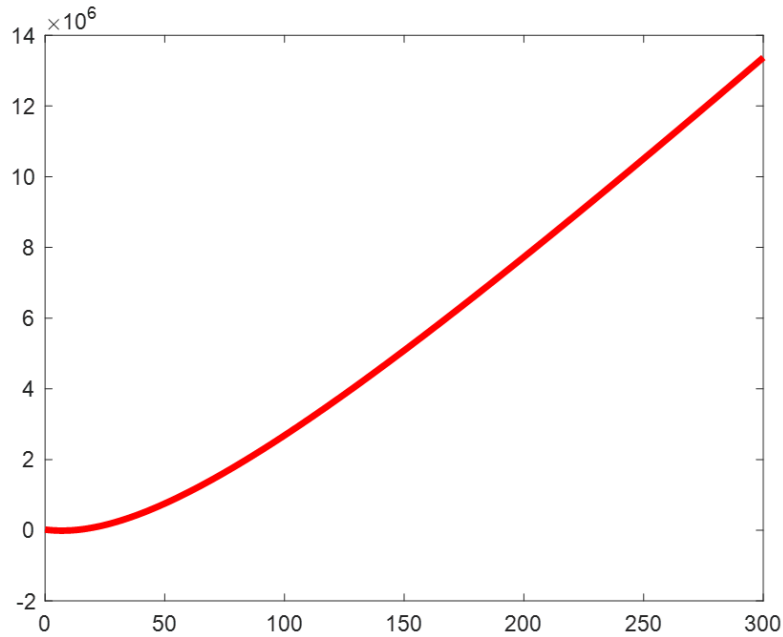
The vertical axis represents the profit of the reproducing manufacturer

By analyzing the profit function using Matlab, we can conclude that the profit of a first-order merchant's product increases and then decreases with its specified price. However, for the low price preference coefficient, the profit response of a first-order merchant is not significant. Maintaining the stability of a first-order price is an effective means for a first-order merchant to improve their self profit acquisition when the market volume is constant

For second tier merchants, the pricing of their products is determined by the pricing of their products. In a completely transparent Nash equilibrium game model[12], the strategy they adopt largely depends on consumer preferences for low-priced products. In the absence of knowledge of the credibility of second tier products, r has a significant impact on the profits of second tier merchants. Therefore, for second tier merchants, pricing should follow that of first tier merchants, Maintaining one's advantage in low prices is the best way to increase profits.

When the depreciation coefficient of a new product changes, our image does not change much, indicating that the depreciation coefficient of the new product does not have a significant impact.

The depreciation coefficient of first generation products, the convenience of purchasing new products, and the degree of price reduction for first generation products can also affect the optimal price of second generation products and the optimal degree of price reduction for first generation products. Therefore, manufacturers need to consider these factors comprehensively and develop the optimal pricing strategy to achieve maximum profit.

The horizontal axis represents the price of the first stage product
The vertical axis represents the market gap in the primary market
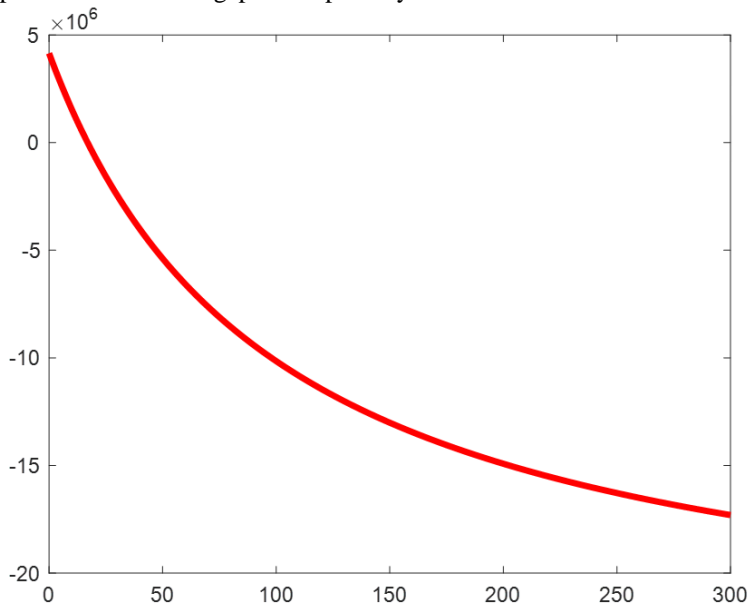
The horizontal axis represents the price of the first stage product
The vertical axis represents the market gap for remanufacturers

The point at which the second derivative is 0 is the optimal price.

When the price in the first stage is too high, the market gap for consumers will be very large. At this time, the secondary market will take effect[13][14], and the secondary market will come to fill the market gap. The demand in the secondary market has increased, resulting in higher profits and a decrease in demand in the primary market. So excessively high prices can lead to lower profits in the primary market, higher profits in the secondary market, and lower overall market profits. This is not a rational market choice. When we consider the prices in the secondary market, we find that the profits and prices in the primary market first increase and then decrease, indicating that the Nash equilibrium between the primary and secondary markets is around 30. Due to the influence of other factors, it is not clear.

The primary market products refer to products sold directly by manufacturers to end consumers, while the secondary market products are sold through other market channels. If a manufacturer's products are sold in large quantities in the secondary market, they can attract more consumers by lowering the prices of products in the secondary market. Although this may reduce the profit of the product, it is still beneficial for increasing

market share and achieving higher short-term profits.

However, completely reducing the price of secondary market products is not the optimal strategy, as it may damage brand image and market reputation. On the contrary, manufacturers can achieve higher market value by improving the quality and reputation of products in the primary market. Products in the primary market are usually more expensive than those in the secondary market, but they also have higher quality and licensing requirements for entry[15]. If consumers believe in the manufacturer's brand and product quality, they are likely to be inclined to purchase more expensive primary market products and are willing to pay higher prices for higher quality and reputation.

Meanwhile, factors such as the depreciation factor for selling first generation products, the convenience of purchasing new products, and the degree of price reduction for first-order products may also affect the strategies of manufacturers and the secondary market. If the depreciation coefficient of a generation of products is relatively high, consumers will tend to purchase cheaper secondary market products, which will force manufacturers to lower the price of secondary market products to maintain market share. On the other hand, if first-order products have a superior purchasing experience, consumers are more likely to turn to new products, which will also prompt manufacturers to launch new products as soon as possible to avoid profit loss.=

Considering these factors, manufacturers need to carefully consider the optimal pricing strategy to increase market share without compromising market brand and profit. This requires analyzing their situation based on game theory. For example, if a manufacturer lowers the price of products in the secondary market and improves the quality and reputation of products in the primary market, the probability and risk of price returns in the secondary market will be reduced. If the market accepts such a strategy and is willing to pay a higher price to purchase primary market products, then the manufacturer's profits will be increased.

On the other hand, if manufacturers adopt overly aggressive pricing strategies, it will lead to consumers questioning the brand and market image, which will have a negative impact on long-term profits. Therefore, in order to achieve maximum profit, manufacturers need to consider the balance point between secondary market prices and primary market quality, and find the optimal price while maintaining brand image and market reputation

In summary, considering consumer preferences for low prices is one of the important factors that manufacturers and secondary markets need to consider when formulating pricing strategies. Manufacturers need to use different strategies to attract consumers and achieve maximum profits. Risk analysis: The second-hand book market only reaches its peak sales season during graduation season and the beginning of school year, and is mostly in the off-season during the rest of the time, with fewer students purchasing second-hand textbooks. In this process, new book sellers and second-hand book recyclers face different challenges and opportunities due to their different characteristics.

Firstly, for new book sellers,

It is recommended that they seize consumer preferences for new products and increase their added value in order to gain more market share. At the same time, when considering product pricing, multiple factors should be comprehensively considered, including the depreciation coefficient of the first generation product, the convenience of purchasing new products, the degree of price reduction of the first generation product, and consumer preference for low prices. For the depreciation coefficient of a generation of products, new book sellers can increase their added value through marketing methods, such as giving small gifts or coupons as gifts[16]; For the convenience of purchasing new products, new book sellers can increase their purchasing convenience through online sales, online bookings, and other means to attract more consumers; For the degree of price reduction of first-order products, new book sellers should grasp market information, price reasonably, and avoid the risk of price wars; For consumers' preference for low prices, new book sellers can meet their needs through special promotions, discounts, and other means.

Secondly, for second-hand book recyclers, it is recommended that they deeply tap into the potential of the second-hand book market and provide better services to attract more consumers. Second hand book recyclers can adopt various recycling methods, such as online recycling, offline recycling, mail recycling, etc., to increase the convenience of consumers recycling second-hand books. At the same time, second-hand book recyclers should also pay attention to the quality requirements of consumers for second-hand books, improve the quality of recycling, and meet the needs of consumers. When considering the pricing of second-hand books, multiple factors should also be taken into account, such as the degree of novelty, market demand, added value, etc., in order to provide consumers with high-quality second-hand book products.

Finally, for consumers, it is recommended that they choose different purchasing methods based on their own needs and actual situation. For consumers who pursue new products, they can choose to purchase the latest products from new book sellers; For consumers seeking low prices, they can choose to purchase second-hand books from second-hand book recyclers; For consumers who pursue quality and added value, they can choose different purchasing methods based on their actual situation.

In summary, we have put forward different suggestions for consumers, markets, new book sellers, and

second-hand book recyclers, in order to better meet consumer needs and promote healthy market development.

Nowadays, as college students' online shopping has become a normal situation, it is very necessary to build a platform for recycling college students' physical book resources. Using the Internet for online book trading can not only solve the problem of college students' demand for textbooks, but also realize the circular use of books, improve the effective utilization of resources, cultivate college students' awareness of environmental protection and conservation, and build a "conservation oriented" campus. In addition, book recycling and public welfare are combined

References:

[1]. Ren Changyu. Research on the Current Situation and Development Strategies of Online Trading Platforms for Second hand Books in China [D]. Qingdao: Qingdao University of Science and Technology, 2019
[2]. Wang Lina, Li Jie. Research on the Operation Strategy of Campus Second hand Book Trading WeChat Platform [J]. Think Tank Times, 2019 (7): 244
[3]. C. Zhou, H. Li, L. Zhang, et al. Optimal recommendation strategies for AI-powered e-commerce platforms: A study of duopoly manufacturers and market competition. Journal of Theoretical and Applied Electronic Commerce Research, 2023, 18(2): 1086-1106.
[4]. Yang Bingnan, Wu Yu, Wu Hao, Guo Qian. Analysis of Online Trading Platforms for Second hand Books of College Students [J]. Modern Business and Industry, 2015 (20): 71-72
[5]. Zhang Yan. Should Find a Good Destination for Old Books [N]. Chongqing Daily, 2017-09-01
[6]. Qi Lixia, Hou Ruiyuan, Yang Wenqi, Li Faqing, Zhou Tiancai. Research on the Small Program Trading Platform for Second hand Books for College Students [J]. Henan Science and Technology, 2019 (32): 31-32
[7]. C. Zhou, X. Li, Y. Ren, et al. How do fairness concern and power structure affect competition between e-platforms and third-party sellers? IEEE Transactions on Engineering Management, 2023, DOI: 10.1109/TEM.2023.3262318.
[8]. Zheng Shuanghao, Cheng Yuan, Bai Xue, Gao Yuanping. Conception and research on a new operating model for second-hand books in universities [J]. Management Observation, 2018 (23): 112-113116
[9]. C. Zhou, M. Leng, Z. Liu, et al. The impact of recommender systems and pricing strategies on brand competition and consumer search. Electronic Commerce Research and Applications, 2022, 53: 1-15.
[10]. J. Yu, C. Zhou, G. Leng. Is it always advantageous to establish self-built logistics for online platforms in a competitive retailing setting? IEEE Transactions on Engineering Management, 2024, 71: 1726-1743.
[11]. Zhu Friedenberg, Jean Tyrol. Game Theory [M]. Renmin University of China Press, 2010
[12]. American] Mankiw. Principles of Economics [M]. Peking University Press, 2020
[13]. Wang Fangjun. Development and Theoretical System of Game Theory. Business Information. 2014:76
[14]. Guo Peng, Yang Xiaoqin. Game Theory and Nash Equilibrium. Journal of Natural Sciences, Harbin Normal University. 2006, 4 (22): 25-28
[15]. Zhang Weiying. Game Theory and Information Economics. Shanghai: Shanghai People's Publishing House, 2004
[16]. C. Zhou, W. Tang, R. Zhao. Optimal consumer search with prospect utility in hybrid uncertain environment. Journal of Uncertainty Analysis and Applications, 2015, 3(6): 1-20.
[17]. J. Yu, J. Zhao, et al. Strategic business mode choices for e-commerce platforms under brand competition. Journal of Theoretical and Applied Electronic Commerce Research, 2022, 17(4): 1769-1790.
[18]. Bi Jingjuan. Research on Digital Rights Management Based on Game Theory. Xi'an: Xi'an University of Electronic Science and Technology, 2012
[19]. C. Zhou, W. Tang, R. Zhao. Optimal consumer search with prospect utility in hybrid uncertain environment. Journal of Uncertainty Analysis and Applications, 2015, 3(6): 1-20.
[20]. Zhuguo Research on Optimization of Financial Non performing Asset Value Evaluation Based on Signal Transmission Game and Market Equilibrium Perspective [D]. Zhejiang University of Finance and Economics, 2021. DOI: 10.27766/d.cnki.gzjcj.2021.000245
[21]. X. Cui, J. Yu, A. N. Khan. Interaction between manufacturer's recycling strategy and e-commerce platform's extended warranty service. Journal of Cleaner Production, 2023, 399: 1-16.
[22]. Zhang Xukun, Julie. Characteristics of Equilibrium in Speculative Markets [J]. Social Science Frontline, 2011 (01): 54-66
[23]. J. Yu, Z. Song, et al. Self-supporting or third-party? The optimal delivery strategy selection decision for e-tailers under competition. Kybernetes, 2023, 52(10): 4783-4811.
[24]. C. Zhou, W. Tang, R. Zhao. An uncertain search model for recruitment problem with enterprise performance. Journal of Intelligent Manufacturing, 2017, 28(3): 695-704.
[25]. Zhou Zhengbing. Normative Analysis of Book Discounts [J]. China Publishing, 2010 (05): 19-22
[26]. Zhang Zhiqian. Taking Technical Measures to Promote Balanced Development of Primary and Secondary Markets [J]. Lixin Academic Journal, 1998 (01): 26-27. DOI: 10.16314/j.cnki.31-2074/f.1998.01.007