On the Rise of Overseas Purchasing Industry from the Perspective of Price Discrimination and Game Theory

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Abstract. With the rapid development of China's e-commerce industry, the consumption level of Chinese consumers and the demand for high-quality foreign products continue to increase, which has led to the emergence of overseas purchasing industry. This paper mainly combines the theory of price discrimination and game theory, from the perspective of merchants and buyers, and explains why the overseas purchasing industry can take advantage of the price advantage. The study found that price discrimination cannot always be contained, because from the perspective of "rational people", its application in purchasing has achieved a "win-win" between consumers and merchants, thus improving the public welfare. However, starting from the overall long-term welfare, China should strengthen industry supervision, establish a formal purchasing system, improve relevant legal systems, improve the e-commerce tax system, and establish domestic duty-free shops to promote the sustainable and healthy development of the overseas purchasing industry.

1. Introduction

Overseas purchasing is an industry born in the Internet era. Overseas purchasing is an indirect shopping activity that represents consumers in completing the commodity trading process overseas. With the development of the Internet and the opening of various regions of the world, the needs of Chinese consumers have spread to foreign brands and commodities, but due to a series of factors, such as distance, time, policy and other restrictions, the purchaser uses the region, etc. The advantage of completing the payment and acquisition of goods, and then mailing goods to consumers through logistics services, is the main form of overseas purchasing nowadays. The emergence of this new type of industry has been widely favored by the public because it can broaden the market of domestic consumers and the convenience of its consumption process, and has become a hot spot in today's society.

Overseas purchasing has the advantages of wide coverage, fast delivery speed and high service quality, and has become an indispensable factor in the overseas purchasing transaction process. The consumer psychology and internal factors of domestic consumers have also contributed to the prosperity of the overseas purchasing economy, which has led to the continuous expansion of domestic demand for foreign goods. The most basic advantage of overseas purchasing is the lower price. Compared with domestic counters, such as cosmetics, the price of purchasing will be much lower. So, what is the cause of this phenomenon? Based on the theory of price discrimination and game theory, this paper combines the relevant research of predecessors and scholars to analyze the price discrimination in domestic and foreign markets, the price discrimination of purchasing by group and individual shopping, and the game theory of buyers and sellers.
Many scholars combined theories with relevant data to analyze the phenomenon of the rise of overseas purchasing. Chen Jie (2003) firstly pointed out that price discrimination is one of the core contents of the network economy’s competition strategy. Her research mainly analyzes the area of realization mechanism, mechanism and application of price discrimination, and lays a foundation for further research on price discrimination in the network economy environment.

Yao Hehui (2012) believes that economic transaction cost theory and price discrimination theory are the main theoretical basis for strengthening copyright protection and restricting rational use in the digital age. At the same time, it is pointed out that some reasonable uses are to overcome market failures with excessive transaction costs. The theory of transaction cost and the theory of price discrimination have a certain explanatory power for the narrowing of the scope of reasonable use. At the same time, Dong Ruixia (2012) combined with the "break-even" model and the "price discrimination" theory in economics, the study found that the price discrimination cannot be contained, because its application in group buying behavior has achieved. The “win-win” between the business and the merchants has led to an increase in the overall welfare of the society. On the basis of the ordered logistic regression model, Zhao Bo (2017) uses the survey data analysis results to show that the difference of purchasing price and the consumer psychology that is assured of the quality of purchasing goods are a marketing combination that significantly positively affects consumers' willingness and behavior of overseas purchasing. He believes that the level of understanding of overseas purchasing products, the monthly income of consumers and the cultural level of consumers are all characteristic factors that have a significant positive impact on consumers' willingness to purchase overseas.

Zhao Yu and Chen Lijun (2015) start from the factors affecting the willingness to purchase overseas, and assumed that consumer cosmopolitanism, brand origin country image, perceived quality and lifestyle have a significant impact on overseas purchasing wills, respectively, followed by the statistical software of SPSS18.0 and AMOS8.0 analysis of factors affecting the willingness to purchase overseas products. The results show that the factors that promote overseas purchasing include the brand's origin image, perceived quality and lifestyle, and the influence of consumer cosmopolitanism on overseas purchasing willingness is not significant. This result has certain reference significance for product promotion and marketing practice. Jun Hong (2013) summarized the advantages and disadvantages of online shopping by comparing online shopping and traditional shopping. Through the establishment of economic model, the economic principle of online shopping was studied, and the improvement method of online shopping was proposed.

2. On the overseas purchasing business from the perspective of price discrimination

Regarding price discrimination, the French scholar Tirole gave the definition: “When the prices of the same kind of physical goods of two units are different for the same consumer or different consumers, we can say that the producer is implementing Price discrimination.” [7] When a firm faces more than one market that are separated from each other in some form and the demand elasticity is different, price discrimination becomes a pricing strategy that the company may adopt. The main purpose of the price discrimination strategy is to obtain a higher share of the consumer surplus than the unified pricing.

According to Pigou's thinking, price discrimination is usually divided into three levels. First-degree of price discrimination is complete price discrimination. When the producer knows exactly the price of each consumer's reservation and can prevent arbitrage between consumers, he can formulate an individualized price equal to the consumer's reserve price, so that he can
successfully acquire the entire consumer surplus. [8] Second-degree of price discrimination is the indirect selection of producers between consumers based on the different choices of consumption (self-selection mechanisms). Third-degree of price discrimination is the producers use to take advantage based on certain consumer-related signals (such as age, occupation, location, etc.). This paper analyzes the rise of the overseas purchasing industry from the perspective of the second- and third-level price discrimination.

2.1 The third-degree of price discrimination in domestic and foreign markets

Different from China’s local enterprises, overseas enterprises operate in more than one country, and the arbitrage between markets is not easy to occur due to transportation costs and trade barriers in various countries and regions. So it pays more attention to the differences in consumer demand between countries and regions. That is to say, for overseas companies, third-level price discrimination is the main form of the third-degree of price discrimination mentioned above. The pricing of tertiary (multi-market) price discrimination is based on the following inverse elasticity rule: It is assumed that a multinational company produces a single product at the total cost of $C(q)$, and it divides the total demand into $m$ markets by the location of the buyers. These $m$ markets have $m$ down-slung products demand curves that can be distinguished. Assuming that multinational companies are aware of these demand curves and that arbitrage cannot occur between markets, overseas companies cannot discriminate within a market (even if they are second-degree of price discrimination). Therefore, overseas companies set a linear price for each market:

Let $(p_1, p_2, ..., p_m)$ represent prices in different markets,

And let $(q_1=D_1(p_1), q_2=D_2(p_2), ..., q_m=D_m(p_m))$ represent the quantity of demand,

Let $(q=\sum_{i=1}^{m} D_i(p_i))$ represent the total demand,

Product companies maximize their profits by choosing different pricing:

$\sum_{i=1}^{m} p_i D_i(p_i) - C(\sum_{i=1}^{m} D_i(p_i))$

Therefore, for all $i$, $D_i(p_i) + p_i C_1 - C(q) \cdot D_i(p_i) = 0$,

That is $\frac{p_i - C(q) \cdot 1}{p_i} \epsilon_i$

In the above formula, $\epsilon_i = -D_i(p_i) \frac{p_i}{D_i(p_i)}$ is the demand price elasticity of the market $i$.

Optimal pricing means that multinational companies should set higher prices in markets where demand price elasticity is lower, and set lower prices in markets where demand price’s elasticity is higher. Using the "Inverse Elasticity Rule", the cosmetic phenomenon mentioned at the beginning of this article can be explained more comprehensively. First, the importance of products to consumer life is a major factor affecting product demand elasticity. Generally speaking, the demand for household necessities is less flexible, and the demand for non-essential items is more flexible. If there is a big gap in the income level of consumers in the two markets, as a result, the same product has different importance to the life of the two market consumers, which will make the demand elasticity of the two markets much different. Foreign cosmetics such products have become a necessity in our country, so its demand elasticity in China is relatively small. Therefore, manufacturers of cosmetics set higher prices in our country to obtain larger consumer surplus.

Second, product substitutability is another major factor affecting product demand elasticity. Generally speaking, if a product has a substitute in a certain market, and the substitution effect of the substitute is large, the demand elasticity of the product is relatively large, and vice versa. In this sense, some people mentioned at the beginning of this article believe that the development of domestic cosmetics is relatively backward and does not reach the ideal effect expected by
customers, which has promoted the price of the foreign cosmetics. It is precisely because there is no corresponding substitute in China that the elasticity of demand for imported cosmetics in the Chinese market has become smaller. Therefore, the use of “anti-elasticity rules” by multinational corporations, sometimes manifestations are indeed as described at the beginning of this article. Furthermore, the government can impose tariffs on imports and exports. Among them, China’s tariff rate is as high as 30% for the most overseas cosmetically products. In addition, the Renminbi continues to appreciate in recent years which has greatly increased the cost of products, the price of overseas goods and domestic counters. It is much cheaper than the ones, especially the products of local brands, which have led to the high price of domestic cosmetics counters.

2.2 Purchasing group price discrimination for group shopping and individual shopping

The prices of goods purchased by overseas buyers are generally lower than that of traditional shopping malls, especially group purchase. The same goods are sold in different ways, and the price will be much different. For example, a king of perfumes called Zumalong, a bottle with 30ml only costs 320 Yuan in the UK duty-free shop, and 600 Yuan in domestic counters, almost double the price. Why does this happen?

As shown, the merchant has specified four levels of the price: \( p_1 \), \( p_2 \), \( p_3 \), \( p_4 \). In the first consumption segment, the price specified by the merchant is up to \( p_1 \). When the number of consumers increases from \( q_1 \) to the second segment: \( q_2 \), the price drops to \( p_2 \); when the number of consumers increases to the third segment \( q_3 \) At the time, the price continued to fall to \( p_3 \); when the number of consumers increased to the fourth segment \( q_4 \), the price dropped to a lower \( p_4 \).

If there is no price discrimination, the total profit of the manufacturer is equivalent to the area of the rectangle \( O p_4 H q_4 \), and the consumer surplus is equivalent to the area of \( \Delta p_4 H \). If the second-level price discrimination is implemented, the increase in the total profit of the manufacturer is the area of the rectangle \( p_4 p_1 B I \) plus the rectangular \( I G C J \) plus the rectangular \( J F D K \), which is
exactly the amount of loss of the consumer’s surplus. The consumer surplus is only about the sum of the areas of ΔAP₁B, ΔBGC, ΔCFD, and ΔDKH. It can be seen that the profits of the manufacturers that implement the second-level price discrimination will increase, and some of the consumer surplus will be occupied by the manufacturers. The number of consumers the overseas buyers face is very huge that are from the whole country and even the whole world. Merchants can greatly increase sales by slightly reducing the unit price. Manufacturers implement secondary price discrimination. Although prices generally decline, but by expanding sales and achieving larger economies of scale, lower unit costs can still increase the profits of merchants. Therefore, in the case of imported products that are originally cheaper than domestic counters, purchasing can get a lower price.

3. On overseas purchasing business from the perspective of game theory

In economics, the main body of the market economy is assumed to be a rational person, and it pursues the maximization of its own interests and follows the principle of maximizing its own utility in the transaction process. When the behaviors of multiple decision-making bodies have interactions, the behavior of each subject to make self-interested decisions based on the information they know and their own ability is actually a kind of game. Each player's equilibrium strategy is to pursue the maximum value of their expected returns, and finally achieve a "balance of non-cooperative games." [9] The matrix is used to analyze the decision-making behavior of both parties.

<table>
<thead>
<tr>
<th>Merchant</th>
<th>The overseas</th>
<th>Group purchase</th>
<th>No group purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make a strategy of group purchase</td>
<td>(8,10)</td>
<td>(0, -5)</td>
<td></td>
</tr>
<tr>
<td>Don’t make a strategy of group purchase</td>
<td>(0, -10)</td>
<td>(0,0)</td>
<td></td>
</tr>
</tbody>
</table>

In the above table, 8 units are used to represent the maximum return of overseas purchasing, 10 units represent the maximum income of the merchant, 5 units are the relevant costs paid by the merchant for the group purchase, and 0 represents no gain from both parties involved. It can be seen that, in theory, the model will reach equilibrium at (8, 10). At this time, overseas buyers can get the maximum profit of 8 units, and the merchant has reached the maximum profit of 10. Regardless of the strategy adopted by the merchant, overseas buyers will select the group purchase decision because he has no income at most but will not lose money. Compared with overseas buyers, the different decisions of merchants will bring different degrees of risk. If the merchant is just waiting for the change, waiting for the overseas purchasing action, then he will not have the opportunity to create any profit, and is likely to lose the benefits that are easily available; if he takes the initiative, he will face both profit and loss. If we start from the theory and weigh the pros and cons, different merchants will make different decisions. However, since the counters have sales tasks, they will choose to cooperate with overseas buyers’ within the scope of their capabilities. When the merchants increase sales, overseas buyers also can get a lower price, so as to attract more customers to get more profits.
4. Conclusions and Recommendations

The analysis shows that consumers have gained additional utility in choosing overseas purchasing transactions, which has enhanced both their satisfaction and consumer surplus. At the same time, merchants have created growth points of profits based on the original profitability of participating in group purchases. Both parties involved in the transaction have increased their own economic interests in the group buying market and achieved a win-win situation, so that the overall welfare of the whole society is also growing in the transaction. Overseas purchasing brings a lot of benefits and convenience to our life. At the same time, there are still some problems in overseas purchasing. As a rational consumer, we have to choose the right way to purchase according to individual needs and actual conditions to ensure that we get bigger utility.

At the same time, from the perspective of "rational people", the government should not blindly limit the price monopoly in price discrimination without unilaterally protecting the interests of consumers, if it reduces the net loss of consumers within a certain range and increases with the interests of the whole society, then this behavior should be affirmed. However, standing in the position of the People's Republic of China, this is not conducive to the country's overall interests, because the online transactions conducted by overseas purchasing are extremely concealed, and it is difficult for tax authorities to understand their real economic conditions, which makes tax supervision a difficult problem. Therefore, China should explore the proposal to purchase a unique tax system for scattered individuals, adjust and improve the Customs Regulations, and reduce or eliminate unreasonable charges in the import chain. In addition, we can learn the advanced experience of Hainan Province and establish a duty-free shop in the territory to promote the sustainable and healthy development of the online overseas purchasing industry.

References