



# Tentative Research on Lemon Problems in the Internet Transaction

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## ABSTRACT

*While the scope of entities transacting through the Internet is enlarged, the objects they are dealing with are also enriched. Therefore, the information asymmetry does not disappear, but develops to be even worse under the new Internet environment. Traditional products and services' "lemon" problems still exist, and many new traits of digital products and services lead to new features of "lemons" problems. In order to lessen these problems, the product or service producers ought to actively market themselves through new channels; the two parties concerned should search for the help of authorized institutions and information brokers/agents; incomplete contracts are also suitable choice for they can restrain sellers from selling inferior commodities.*

## INTRODUCTION

It is no denying that information is very important in our daily life. Not only microeconomics' perfect market, information economics but also Coase's transaction costs put much efforts on information. Due to the existence of the asymmetric information, dealing partners have to input more in each transaction and will undoubtedly lead to the inefficiency of the market.

## INFORMATION ASYMMETRY PROBLEMS STILL EXIST IN THE INTERNET TRANSACTIONS

The Internet develops in an unusually rapid speed. In only 4 years, the Internet users have reached 50 million, whereas the spread of computers to the same level takes about 16 years<sup>1</sup>. Because of the existence of consumers' increasing marginal utilities in the new economy, the Internet spread is actually accelerating in every sphere, and electronic commerce is accordingly popularizing, so are the Internet transactions. The Internet transactions involve a large scope. In this paper, we mainly concern the static dealing relationships between buyers and sellers and their trading objects.

As we know, the Internet can realize information sharing, eliminate space restrictions and time limits. Hence someone<sup>2</sup> points out that the information asymmetry in the Internet environment differs from that of the traditional one, and the information asymmetry has been greatly weakened now. This kind of statement lacks thorough analyses. According to information economics<sup>3</sup>, the asymmetric information is caused by people's opportunism. Therefore the problems are not merely a matter of technology, but even an economic issue.

## INFORMATION ASYMMETRY IN PRODUCTS' OR SERVICES' QUALITIES WORSEN IN THE INTERNET TRANSACTIONS

It is true that communication problems have been greatly relieved in the Internet environment, however the alleviation of space restrictions and time limits simultaneously indicates the uncertainty of counterparts' identities, not to speak of other information. According to Albert Angehn<sup>4</sup>, the most basic and also the easiest step for companies to achieve is the virtual information layer. Therefore many companies set up their own websites, the scope of entities involved in the Internet transactions is also enlarged, and dealing objects abundant.

Owing to Andrew B. Winston's<sup>4</sup> definition, the digital products and services dealing through the Internet possess many new traits that

altogether may worsen the quality information asymmetry in the Internet transactions.

**Digital products or services are usually experiential products.** That is to say, people can only know the qualities after practical using because of their intangible feature. This feature makes the quality information communication more difficult.

**Many digital products or services are largely liable to time.** Services like stock pricing and weather forecast belongs to this kind of services. These also worsen the existence of the qualities' information asymmetry between buyers and sellers.

**That the digital products can be copied for numerous times results in the overflow of duplicates in the market.** In the market there exist many fake digital products with lower price that possess the similar functions and almost same features, hence the real digital products have the threat to be squeezed out the market.

**Digital products and services supply highly personalized service.** Personalized service is the demand of the market, however the power of verbal recommendation has been greatly weakened in this new Internet market, making it difficult for the loyalty built in one consumer to diffuse to others. The information asymmetry problems thereby have the potential to be deteriorated.

**Suppliers of digital products and services have difficulties in showing information signals.** Information signal<sup>5</sup> is one way to solve the asymmetric information problems in the information economics. In the Internet environment, companies can set up their own websites regardless of the actual size. The signals accordingly hold fewer differences. Thus the information asymmetry problems have been worsened.

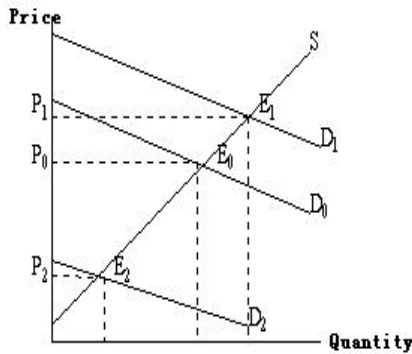
## PRODUCTS' AND SERVICES' LEMON PROBLEMS ANALYSES IN THE INTERNET TRANSACTIONS

The lemon problems was initially proposed by Alklof<sup>6</sup> in 1970s. It turns to be clear that in the Internet transactions, lemon problems not only exist but also differ from traditional ones.

Here we mainly discuss the lemon problems in the Internet transactions. Suppose there are two products or services suppliers, as the picture 1 shows. We assume that customers' demand for high quality products are  $D_1$  and that for low quality ones are  $D_2$ . The market supply curve is that of the high-quality ones  $S$ .

If the information transmission is complete in this market and the consumers can distinguish high-quality products or services from low quality ones, the market price of high-quality and low quality ones will respectively be  $P_1, P_2$ . But in reality, sellers may hide certain information about their products or services so as to earn large profits. This action will undoubtedly lead to the information asymmetry in the

Figure 1



market. In this way, the consumers on the other hand can only estimate the possibility to buy each kind of products or services and accordingly further decide the demand for that products or services.

Suppose the estimated possibility of buying high-quality products and low-quality products are:  $e, 1-e$ . and the real demand curve is  $D_0$ .

In this case the actual price in the market will be:  $P_0 = e P_1 + (1-e)P_2$ .

Assume the products or services industries' normal profit rate is  $r$ , the costs of high-quality products or services and low-quality ones are respectively  $C_1, C_2$ .

As discussed before, the dealing objects are greatly enlarged in the Internet transactions. As usual, different kinds of objects may cause different influences.

As for physical products and services, they are still subject to the traditional economic theories. Whatever the producers are processing the high-quality ones or the low-quality ones, there remains a relationship:  $C_1 > C_2$ .

On the contrary, it is the fixed variable costs/marginal costs of the new economy<sup>8</sup> that contributes to the Internet transactions. This trait in detail means large fixed costs and small and unalterable variable costs. America scholar Soon-Yong Choi<sup>4</sup> points out: the fact that the fixed costs are far greater than the variable costs, there exists a high barrier to low-quality digital producers. Therefore, there exist many duplicates producers instead of low-quality producers in digital products market. However the manufacturing costs of copied products equal the variable costs of the high-quality ones. Hence, here copied digital products represent the low-quality digital products we concerned. That is to say:  $C_1 \gg C_2$ .

As to the Internet services, inputs are also large. However the inferior services producers basically input very little. Hence for the Internet services, there also exists the relationship like  $C_1 \gg C_2$ .

Suppose the normal profit rate of two kinds of producers remain  $r$ , thus in the market which sellers and buyers can enter freely (something like a perfect competitive market), there lies the relationship:  $P_1 = C_1(1+r)$        $P_2 = C_2(1+r)$

Consequently the actual market price is  $P_0 = [e C_1 + (1-e) C_2](1+r)$ .

Therefore when the actual price is  $P_0$ , the profit rate of the high-quality products suppliers can be showed:

$$r_1 = \frac{P_0 - c_1}{c_1} = r - (1+r)(1-e)\left(\frac{c_1 - c_2}{c_1}\right)$$

and the profit rate of the low-quality ones is:

$$r_2 = \frac{P_0 - c_2}{c_2} = r + (1+r)e\left(\frac{c_1 - c_2}{c_2}\right)$$

In that the costs of physical products and services remain a relationship like  $C_1 > C_2$ , thus there exists a relationship:  $r_1 < r, r_2 > r$ .

As for the digital products and services, there remains  $C_1 \gg C_2$ . So the relationship are different, they show like  $r_1 \ll r, r_2 \gg r$ .

In this case, for the physical products or services, the final market price  $P_0$  will greatly benefit the inferior ones' producers instead of the superior ones' suppliers. Accordingly the profits of the superior products or services producers cannot offset their relative costs, those producers have to retreat from the market. This withdrawal reduces the possibility  $e$  that customers choose superior products and services, and create new market price that is much lower. Finally when the possibility is reduced to 0, the market leaves only inferior products or services producers. When this happens, the fact that whatever the consumers buy are inferior products and services may promote the Internet customers' suspicion and resistance upon Internet purchasing. Lack of confidence in purchasing, the Internet shopping demands are reduced, so does relative development of other industries related with online shopping. This vicious cycle grows and further greatly restricts the Internet transactions.

As for the digital products and services, the negative effects of the final market price  $P_0$  to superior products or services producers are worsened. At last, the superior products and services producers have to retreat from the market. With the quit of the products, the number of copied products is also decreasing. This kind of digital products will eventually disappear from the market. Similar to the physical products or services market, the digital services market will also finally vanish.

Therefore it turns to be obvious that the lemon problems appear different with dissimilar dealing objects. Whatever they are, it is very true that the lemon problems in the Internet transactions may all cause the market failure and lead to large social losses.

## RELATIVE STRATEGIES TO RESOLVE THE LEMON PROBLEMS IN THE INTERNET TRANSACTIONS

The lemon problems lead to the inefficiency of the whole market, while the inefficiency on the other hand will deteriorate transactions in the market. Therefore in the Internet transactions, we should take many strategies.

### Suppliers Should Find Channels to Convey Their Products Information

*Modes like Advertisement, Mass-Media and Websites are Surely the Optional Choice for Suppliers to Spread Their Products Information*

In the Internet transactions, it is simple for sellers to set up their own website and spread basic information about the products, this will furnish 24 hours continuous service. In addition, good customer feedback systems should be designed, since they are helpful in improving relative functions according to customers' requirements.

### Suppliers also can Adopt Promotion Methods Like Free-Samples Offering, Tryout Products Distributing

They are usually helpful in the Internet transactions. Usually, when the costs of the products are higher than the price low-price accepters can take, the companies can only take the high-price accepters into considerations. On the other hand, they may take both.

### Sellers and Buyers can Turn to the Authorized Information Evaluation Agents for Help

With the development of the Internet transactions, authorized evaluation agencies can also be established in the Internet environment, exploiting their information communication channels and facilitating the queries of both buyers and sellers.

### Information Brokers or Private Information Agents can Effectually Restrain the Behavior of Sellers

Here the information agencies are self-operating companies with the aim of largest profit. Their main business is to evaluate the infor-

mation about products' and services' qualities, then they sell them to customers just like products.

#### **Dealers can Come to an Incomplete Contract, and Restrict Sellers from Selling Inferior Products or Services**

According to Hatte<sup>7</sup> definition of incomplete contracts, the mechanism will restrict the behavior out of the line and compel them to perform according to their duties.

Generally speaking, lemon problem is the radical analyses of the results of the inferior products or services. In the Internet transactions, the dealing objects not only include physical products and services, but also many digital ones. All those new features cause the deterioration of the lemon problems. Therefore, online products and services suppliers should actively search for measures.

#### **REFERENCES**

- [1] Marilyn Greenstein & Todd M. Feinman: *Electronic Commerce: Security, Risk Management and Control*. Beijing: Mechanical Industry Publishing House. 2000.4
- [2] Yin Becheng & Wang Liwen: *New Economy and Traditional Theories*, Economics Dynamics, P63-65 2000.11
- [3] Wang Zeke & He Jie: *Information Economics Overview*, Chinese Economic Publishing House 1999
- [4] Soon-Yong Choi, Dale O. Stahl & Andrew B. Whinston: *Electronic Commerce Economics*, Zhang Deliy Electronic Industry Publishing House
- [5] Huang Chun & He Wei: *Information Economics*, Economic Science Publishing House 1988
- [6] Akerlof Gy: "The Market for Lemons: Quality Uncertainty and the Market Mechanism" *Quarterly Journal of Economics*, 84:488-500
- [7] Hattey: "Companies, Contracts and Financial Structures" Shanghai People's Publishing House 1998
- [8] Carl Shapiro, Hal Varian: "Information Rules: a Strategic Guide to the Network Economy" Chinese People's University Publishing House 2000.6

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