



The Source of Value for Internet Platforms

Bo Song, Weiming Chee

City University of Malaysia, Selangor, Malaysia

Email: bobo@sdu.edu.cn

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Abstract

Amid the Internet economy, the platform economy has become one of the most valuable topics for research at present. Physical enterprises also embrace the opportunity brought by the development of “Internet Plus” with the popularity of the Internet technology, trying to operate on Internet platforms. According to the existing research, there are few studies on the value source of Internet platform, and there is a lack of description of the original driving force for the expansion of Internet platform. This paper first introduces the development stage of Internet technology. The change in Internet technology has brought about the rapid expansion of the scale of Internet platform. Then the paper makes literature research on transaction expenses, scale economy, and dialectical relationship between market and enterprise. Finally, through model analysis, the valuable sources of the Internet platform are identified as follows: the saving of transaction costs by the Internet platform and the allocation of resources by the Internet platform.

Subject Areas

Business Management

Keywords

Internet Platform, Transaction Expenses, Internet Technology

1. Introduction

Internet platform economy is a new economic form based on Internet technology, big data, cloud computing and other new generation of information technology. The platform is the most important feature of economic industry of the Internet era.

The current development of Internet technology has gone through two stages: Web1.0 and Web2.0. Web1.0 mode, the website is the publisher of all informa-

tion. With the help of Internet technology, end users can access information more quickly. From this point of view, in the Web1.0 era, only a few information publishers and end users are only the recipients of information.

Web2.0 is an ideological change. At this point, technology is only a means to achieve an end. In the Web2.0 age, the end user is not only the receiver of the information, but also the sender of the information. At the same time, the relationship between the end users is caused by the exchange of information. In such a case, monopoly and authority are broken, and everyone is a participant in the transformation of the Internet era, as its sense of existence and sense of belonging in the Internet environment continues to increase and make the amount of information explosive growth.

In the era of Web2.0, the Internet aggregated countless terminals in the form of the platform, evolving from unilateral into multi-lateral interaction, thus creating a business model of the Internet platform. Since 2000, Internet enterprises have undergone tremendous development. Some Internet enterprises have reached the scale that traditional ones can only reach in decades or even a hundred years in just a dozen years or so.

Essentially, Internet platforms serve as an intermediary. Unlike brick-and-mortar enterprises, those on Internet platforms do not engage in actual production. Therefore, the cost and benefit analysis of enterprises will be quite different from the traditional analytical paradigm, which largely relies on the production of real industries [1]. Therefore, it is necessary to find out or create a set of analytical paradigms for Internet enterprises. The rapid development of them also attributes to their low marginal cost and large-scale profits. So where are the huge amount of profits come from?

It is generally believed that the Internet reduces transaction expenses. In the analytical paradigm of new institutional economics, the enterprise is a substitute for the market when transaction expenses are high, and the scale of enterprises should be reduced when transaction expenses are low. In fact, with the reduction of transaction expenses in the Internet era, the threshold for innovation and entrepreneurship has been gradually lowered. In the meantime, innovative and entrepreneurial activities are springing up. The emergence of individual entrepreneurs is evidence of the reduction in business size when transaction expenses are falling. However, as the carrier of innovative and entrepreneurial activities, Internet platforms have embraced a growing number of enterprises. Therefore, we have to think about the nature of Internet enterprises. What is the relationship between its scale and transaction expenses? Therefore, it is necessary to find out the source of value for Internet platforms.

2. Literature Review

2.1. Connotation and Structure of Transaction Expenses

In his classic work *The Nature of the Firm*, Coase (1960) presented that applying the price mechanism required costs, and then he generalized the costs as trans-

action expenses, thus pioneering New Institutional Economics [2]. Williamson (1975) also defined transaction expenses as the costs necessary for the operation of the economic system [3]. From the perspective of institutional change, Douglas C. North (1994) defined transaction expenses as all the costs required by various economic and political organizations in economic and trading activities [4]. In Zhang Wuchang's view (1999), transaction expenses are the costs other than the costs of production in economic society, which does not exist in "Robinson" economy [5].

As for the composition of transaction expenses, Coase divided transaction expenses into the costs of negotiation, pricing, treaty signing, and implementation and supervision of the contract to fulfil it based on the process of signing and implementing a contract [2]. Williamson divided the transaction into ex-ante transaction and ex-post transaction, and ex-ante transaction included a series of costs of drawing up a contract, further negotiations of both parties on the contract and warranty of the performance under the contract. In addition, Williamson believed that the treaty signed definitely cannot fully meet the needs of both parties, so there are costs after signing the treaty, including the losses caused by inadequate clauses for the requirements, the costs of negotiation on and modification of the treaty in further amending the treaty, and the additional costs of redrafting the treaty [3]. Zhang Wuchang divided transaction expenses into identification costs, measurement costs, assessment costs and negotiation costs, which included the cost of resorting to arbitration institutions [4]. Therefore, in terms of the composition of transaction expenses, there is no authoritative classification. Nevertheless, many scholars have summarized the composition of transaction expenses by centering on the whole process of transaction from the occurrence of transaction to ex-post transaction. It includes the costs of information collection, concluding and signing a contract, supervising the implementation of a contract, and claims which may be incurred afterward.

2.2. Dialectical Relationship between Market and Enterprise

The most important part of Coase's research is the discovery of market's substitution for the enterprise. In economic life, a business organization is a basic unit of market transactions. Due to market transaction costs, it is more economical for companies to form a trading unit with factor providers for market transactions. After proposing the costs of resource allocation in the market, Coase pointed out that there will be organizational costs within the enterprise, such as administrative costs, supervisory production costs, and administrative order transmission costs. Thus, the theoretical scope of transaction expenses expands from market to enterprise. When the size of the enterprise expands, the overhead costs within the enterprise increase accordingly until the overhead costs within the enterprise equal the transaction costs in the market outside the enterprise, and the final enterprise size is the expansion boundary of the enterprise. The root of market transactions is that economic agents have different divisions of production. Therefore, transaction expenses can be regarded as the system

expense of division of labor [2]. North believed that the continuous increase in social division of labor and specialization gave birth to transaction expenses [4]. Zhang Wuchang distinguished enterprises and markets from the perspectives of intermediate product transactions and labor transactions, and believed that enterprises are not a substitution among market organizations, but a substitution of the labor market and the intermediate product market. Economy agents would consider both production costs and transaction expenses [5]. Different levels of specialization in society determine the scale and frequency of production activities and trading activities. The relationship and interaction between production activities and trading activities also determine the degree of social division of labor and the level of specialization by Sheng Hong (2003) [6]. Therefore, the dialectical relationship between enterprise and market is summarized as the research on the relationship between the division of labor and the transaction. The research on the transaction activities is helpful to the research on the division of labor, and the research results on the division of labor will further promote the research on the transaction problem.

Williamson made a more profound and innovative elaboration in the studies on transaction expenses. He used the concept of transaction expenses to study various types of economic organizations and gave a new interpretation of the relationship between enterprise and market from the perspective of contracts. Williamson argued that market, enterprise, or a mixture of the two at different levels are essentially forms of economic organization in which the economic activity performed by economic agents is a decision variable. It is of great significance to analyze the inside of the enterprise, a governance structure.

First, Williamson argued that the attribute of transactions needs to be redefined to adapt the governance structure to the transactions and subsequently reduce transaction expenses. Williamson introduced the concept of asset specialization, which is the cost of transferring an asset for other transactions. In addition, based on the frequency of transactions, Williamson classified transactions into six different types: occasional non-specialized asset transactions, non-specialized asset transactions with high transaction frequency, occasionally mixed type transactions, and mixed type transactions with multiple occurrences, occasional specialized asset transactions, and multiple of dedicated asset transactions.

Second, Williamson believed that the essence of a transaction is the signing, execution and completion of a contract. William H. McNeill, a jurist, divided contracts into classical, neoclassical and relational contracts. In a classical contract, the trader is an independent individual with free will and can act autonomously, and the clauses of the contract are clear and can be executed independently by both parties to the transaction without the intervention of outside forces; in a neoclassical contract, the contract is characterized by longevity and incompleteness, and therefore, sometimes it requires the supervision of third-party institutions for its successful execution; while the relational contracts are more flexible, recognizing the incompleteness of the contract at the beginning of its signing. Thus, with no emphasizing the reference role of the initial clauses,

the specific relationship provisions of both parties to the transaction will change according to the actual situation.

Williamson analyzed and examined the corresponding governance structures for each of the six different transaction forms he listed: if the transaction of non-dedicated assets takes the form of a classical contract, the market will be taken as the corresponding governance structure; if the transaction assets are mixed and the transaction frequency is low, a neoclassical form of contract should be adopted and a third-party governance body should be introduced; if the transaction frequency is high and the asset dedication is not low, a relationship-type contract should be adopted, with joint or unified governance between the two parties. Williamson pointed out that the three dimensions of asset specificity, uncertainty, and frequency of transactions determine the characteristics and types of transactions, and thus, there must be a governance method that can save the relative maximum transaction costs compared with other governance methods. When the asset's specificity is low, the parties to the transaction can always move the asset to other transactions and find other counterparties, so there is no need to enter into a long-term contract based on this asset. Therefore, a classical contract is perfectly feasible for such transactions regardless of the frequency and uncertainty of the transactions. Since the transaction of this asset is extremely competitive, there will not be a phenomenon that the surplus of one party is captured by the other party. Hence, even if the both intend to enter into a long-term contract, the long-term contract can be regarded as a composition of several short-term contracts. In addition, the uncertainty of the transaction behavior can also pose an impact on the choice of governance structure. When there is little uncertainty in the transaction, both parties to the transaction will fully stipulate the possible conditions and corresponding measures in the clauses of the contract, so that the contract no longer requires the intervention of a third party, and the use of classical contracts can satisfy the requirements of both parties to the transaction. When the uncertainty of the transaction increases, the parties cannot effectively anticipate the events that may occur during the transaction, so more complicated transaction rules will be introduced to restrain the possible defaults of the parties. When the degree of asset specificity as well as uncertainty is high, the parties need to enter into other forms of contracts (e.g., hierarchical transactions) to guarantee that the transaction will go ahead. Besides, the frequency of transactions is an essential variable to be considered, but the first variable to be considered remains asset specificity.

Similar to Coase's point of view, Williamson also believed that enterprises' replacement of the market is to save market transaction expenses. However, Williamson's research focuses on whether this product should be provided by the enterprise or the market, that is to say, to what extent the enterprise's scale should be expanded. In order to analyze this problem, Williamson proposed the concept of asset specificity and pointed out the opportunistic behavior before and after the transaction, trying to use these two concepts to explain transaction expenses. He considered that the economic agents participating in the transac-

tion, the use of enterprises or the market to exchange and allocate resources is a decision variable. Among them, asset specificity exerts a much more important effect on this decision.

Therefore, Williamson's core idea is that transactions can be divided into multiple types based on the three dimensions of asset specificity, uncertainty and transaction frequency, and different types have different governance structures to save transaction expenses. This kind of governance structure mainly represents the relationship between the market and the enterprise, which means the type of transaction determines to what degree the enterprise will replace the market.

According to Zhang Wuchang, when enterprises organize production activities, they will buy factors of production for production, so as to manufacture products instead of purchasing them. Therefore, the substitution of enterprises to the market is that of factor market to product market. When opportunistic behavior occurs, vertical integration is a great choice. At this time, opportunism may occur in the market or the enterprise, and different opportunism corresponds to different resource allocation ways.

As economy and society develop, the market transaction expenses are changing constantly. The market, a way of allocating resources, has a changing allocation ability and scale. For instance, the development of finance makes various resource allocation ways possible, such as forward spot transaction, futures transaction, etc. It follows then that the transaction expenses are generally decreasing and the market scope is expanding. Practices show that the scale of enterprises is also expanding, and due to the application of IT and the development of management studies, enterprises can handle larger organization structures, with management costs also reduced.

2.3. Transaction Expenses and Economies of Scale and Scope

In the theoretical framework of neoclassical economics, the definition of "economies of scale" comes from the production function which is used to describe the current situation of factor input and product output of an enterprise. Therefore, the definition of "economies of scale" comes from the comparison of the production cost and output scale. In general, if the order of homogeneous production function is bigger than 1, it is called economies of scale; if the order is 1, it is constant returns to scale; and if the order is smaller than 1, it is called the decreasing of returns to scale. If it is defined by cost function, it is an inverse-negative proposition. Economies of scale refer to the fact that when output increases by the same scale, production cost does not need to invest in the same scale. There are links and differences between scale economy and returns to scale. The former emphasizes more on a long-term state of production, while the latter emphasizes more on technical expression. When the input factors are exogenous and the input price is given, the cost function can be deduced from the production function, and economies of scale at this time are equivalent to increasing returns to scale. Economies of scale places more emphasis on cost savings. The fact shows that the input of factors into the market does not follow the assump-

tion of a perfect competition market in neoclassical economics. In such a case, the buyer with market power can purchase factors of production, including raw materials and labor costs at low prices. The cost saved in this way cannot be strictly regarded as economies of scale.

“Economies of scope” refers to the correlation of production or operation and sales, that is, economic activities in various sectors are associated with each other (Chandler, 1999), which is manifested by the fact that a production or operation unit produces more kinds of products with different factor inputs in its inherent production or sales field than the kinds of products produced by each sector alone. Chandler believed that the use of input factors has multiplicity, and the marketing network also has it [7]. Economies of scope emerged with the improvement of management coverage and brand effect. He held that the sharing of equipment between departments takes advantage of the re-usability of production tools and triggers economies of scope. It can be regarded as economies of scope when an enterprise produces more than one product using only one factor of production, and this expansion of input and output increases the profit of the enterprise. Zhang Wuchang took the time and space into consideration in the definition of economies of scope, and redefined the economies of scope of enterprises and regions respectively. Among them, the latter means that when a region focuses on developing multiple industries instead of one industry, the former will get higher final benefits, even in the case of professional division of labor. It can be said that the regional economy at this time is featured by economies of scope. The input of raw materials, use of equipment, marketing planning, and implementation of internal governance contribute to lower costs for enterprises to produce two or more products. Therefore, economies of scope may occur in any production link of an enterprise, such as production, management, sales and investment. According to Li Yuanxu (2020), when an enterprise combines two or more production lines together and the cost after the combination is lower than the total cost of the multiple lines, the production after the combination belongs to economies of scope [8]. He divided economies of scope into internal and external ones. Internal economies of scope refer to the economies of scope in the general sense, which means that the cost of producing multiple products by an enterprise is less than the production cost of producing the same group of products by multiple enterprises. The external economies of scope refer to the joint production between enterprises, which relies on the formation of industrial alliances to jointly reduce production costs.

Transaction cost involves the cost required to transfer products or services from the operator to the consumer. When transaction parties conduct transactions on the object to be traded, no matter how the property right is transferred and how the contract terms are formulated, this series of actions will generate transaction cost. Therefore, due to the clear rights and responsibilities, and transparent accounting procedures in internal transactions of enterprises, the transaction cost can be reduced, and the product transaction between enterprise departments is more efficient than the product or service transaction between

the two parties. When the proficiency of production and exchange behavior within an enterprise gradually increases due to skill training and production experience, economies of scale and economics of scope can be generated, and there is a strong correlation between the two. The increase of products or services caused by economies of scale makes the exchange activities between departments of an enterprise more frequently, thus lowering more transaction costs, and the frequent exchange activities increase the linkage between departments of an enterprise. Therefore, when departments realize that some intermediate products or services purchased outside have high transaction costs, if the production line of these products or services is incorporated into the enterprise and is no longer conducted through market transactions, the enterprise may generate economies of scope.

3. Value Creation of Internet Platform

3.1. Internet Platform Savings on Transaction Cost

According to Jiang Yingming (2007), this dissertation believes that the transaction expense itself refers to the cost of resource allocation in a transaction, and the transaction cost refers to the product of the transaction expenses and the number of transaction times [9]. In the following text, in order to facilitate the analysis, transaction cost refers to the total transaction expenses spent in unit time. Assuming that in a competitive market where transaction expenses are not zero. When both parties do not enter the Internet platform, the following formula is formed:

$$P_1 = a + c_1$$

P_1 is the price of a transaction for a single commodity. The commodity here no longer refers to the physical commodity alone, but refers to the total utility obtained in information or social intercourse. For better analysis, a refers to the production expenses and expected economic profit of the commodity producer, and c_1 is the transaction expenses required to reach the exchange.

In this transaction, assuming that transaction expenses are not taken into account, the total surplus obtained by both parties is θ , the number of transactions is n_1 , and the total remaining obtained by the parties within unit time is $(\theta - c_1)n_1$.

When the manufacturers and consumers enter the Internet platform, the following formula is formed:

$$P_2 = a + c_2$$

P_2 is the price of a single commodity in terms of trading into the platform. a still refers to commodity producers' production expenses and economic profit, and c_2 refers to the transaction expenses of one transaction when using the platform transaction. n_2 is the number of transactions in an Internet platform per unit of time.

In this transaction, assuming that transaction expenses are not taken into account, the total surplus obtained by both parties is θ , and the total remaining

obtained by the parties within unit time is $(\theta - c_2)n_2$.

It is not difficult to draw the following two assumptions:

Assume 1: Under the Internet technology conditions, the transaction frequency increases: $n_2 > n_1$

Internet technology ensures simultaneous and multipoint links between computer terminals. Meanwhile, the time required for information transmission between computer terminals is largely unaffected by the distance. Therefore, transactions with Internet technology can be conducted at a faster speed and complete more transactions in a unit of time.

Assume 2: On Internet platforms, the product is cheaper: $P_2 < P_1$

Because transaction expenses cannot be measured directly, therefore, in the case of fixed production costs and expected economic profits, the comparison of product prices will be more intuitive for traders. In this assumption, cheaper products are necessary for the existence of Internet platforms. The price here does not refer to price tag, but a psychological subjective price after adding the intended utility.

The Internet platform will reduce the price of platform products in technology and institution, namely, cutting transaction expenses. In the technical dimension, the platform side will ensure the smooth progress of the transaction in the search field and security. The platform side will provide a powerful search engine to help users filter information. In terms of security, it will ensure that the information of the transaction side and the user role will not be stolen. In the institutional dimension, the platform side ensures more comfort and convenience when trading, namely user experience.

In this hypothesis, the production cost and expected economic profit are certain. Therefore, due to $P = a + c$, $c_2 < c_1$ is known when $P_2 < P_1$.

Furthermore, due to $n_2 > n_1$ and $c_2 < c_1$ and as the sum of the remaining parties to a transaction remains unchanged whether it gets access to the platform or not, we can get the following formula: $(\theta - c_1)n_1 < (\theta - c_2)n_2$

After the item is moved, get: $\theta(n_2 - n_1) + c_1n_1 - c_2n_2 > 0$.

The equation left term is the transaction cost saved by the Internet platform in a unit of time, that is, one of the sources of value it creates.

3.2. Transfer of Resource Allocation on Internet Platform

The Internet platform has the dual attributes of the market and enterprises, and its platform members are semi-attached to the platform. On the one hand, the platform members have the independent decision-making power, which can maximize the utility through resource value exchange in the platform; on the other hand, the platform has the right to control part of the resources of the members of the platform, which is reflected in the whole transaction process. Some platforms with large transaction expenses choose to integrate them with platform members. In this process, the platform has the power to make rules [10]. In addition, the platform to reduce transaction expenses to create value is

also reflected in the formulation of rules.

The complete expression of information and the characteristics of multi-point simultaneous link determine the ability of Internet technology to build an online market [11]. The trader behind the terminal can maximize utility through value exchange and increase social benefits [12]. The value means not only the value of physical goods, but also the information that the trader can obtain utility. The trader can use the information obtained online to achieve benefits offline, assuming that the trader can directly use the information to obtain utility. In addition, when we use obtaining utility as an exchange purpose, social communication and emotional communication can also be based on goods as the carrier. Then, when commodities can meet the requirements of the above three ways to maximize utility at the same time, the Internet has constructed not only an online market, but a reset society, or industrial ecology.

In this large online industrial ecosystem, the transaction expenses are not reduced by the Internet technology itself. Only when the platform organizations change the structure of the transaction cost is the construction of the Internet ecology possible. However, it is not difficult to prove that in the whole Internet ecology, there cannot be only one platform organization. The existence of multiple platforms with dominant power and rule-making power separates the Internet industry ecology, resulting in the actual online network performance as the segmented reset society and market. In each segmentation ecology, the platform can use technology and rules to allocate resources by authority. However, due to the existence of competition, the platform side cannot allocate resources according to their own preferences, but should allocate resources as far as possible under market rules as far as possible to ensure maximum total platform benefits.

The platform built by the Internet platform is a reset online society, which is not restricted by natural conditions and is completely realized by technology [13]. This means that, as long as the technical conditions allow, the internal resources of the Internet platform not only include the resources owned when the internal members enter, but the Internet platform itself can also create resources at an extremely low cost. Moreover, the creation of its resources has unlimited ductility, with the most typical examples such as the amount of information displayed on a Web page or the number of gold coins for online game players. At the same time, as the creator of resources, the platform has complete control over this part of resources.

Further, when the Internet platform is regarded as a market, there is no special need to prove before the platform not creates resources that the participating traders of the platform can form a balance according to the general market rules. However, this equilibrium is broken when the platform can create infinite resources. For some heterogeneous market members, if they can spend a certain cost to obtain the power to dominate a part of the resources, they can obtain greater benefits (or utility) than the cost. For the platform side, if the profit from the transfer of resource allocation is greater than the cost, it also has the incen-

tive to transfer this part of resource allocation. Then, the two sides reached deals on the directed dominance of this part of the resources. The so-called directional dominance refers to whether the two parties have reached an agreement on how the resource governs, and the power holder shall not change the dominant direction of the resource. A typical example is that the privileges of members of social networks have stipulated specific powers before purchasing, and the recipients must not have additional behaviors. Not directed allocation, often for technology developers, refers to the platform side open API (application programming interface), the user can use certain resources given by the platform for free allocation (represented by editing program). As the former, the resource-directed distribution platform often transfers the right to monetary income, or implements free subsidies to platform members. As the latter's not directed resource allocation rights in practice are all in the form of free or reverse subsidies to encourage members to use, this form will enable the members to obtain income, and other members to obtain utility, and the platform side will therefore be more competitive. The biggest cost is the use of power the members' early education investment and the opportunity cost of editing related programs [14].

Internet value-added service is the most important application of directional resource allocation [15]. Among them, the advertising booth also belongs to the Internet value-added services. In the past, the literature generally separated advertisers from platform members as bilateral market participants within the platform. However, judging from the actual performance of the Internet platform, there is no significant difference between the advertisers and the platform members. For example, in online forums, in addition to publishing their own information, other members also accept information (including advertising information) released by other members, and advertisers enter the platform only to promote the product, but cannot rule out the possibility that advertisers accept other members' information, therefore, in the forum-based social network platform, advertisers are also one of the platform members. It is not difficult to extend this logic to other types of Internet platforms. Advertisers, as members of the platform, also have the right to use the platform functions, but they only replace the directional control of spatial resources in the platform at a certain cost to show their own products. From another perspective, neither theoretical nor factual data can confirm that advertisements made by advertisers at a cost must be received by other platform members, and bring effective benefits. The economic benefits of advertisers are expected, so they are expressed more accurately by utility where the expected returns of advertisers are positively correlated to the size of the platform and the number of members. Therefore, there is no effective and certain value exchange between advertisers and platform members, and it should not be regarded as a bilateral market.

4. Conclusion

The initial application of Internet technology without connecting with the platform fails to reduce transaction costs, but changes the transaction fee structure.

By setting the business model and continuing to improve the technology, Internet platform companies reduce transaction costs and refine the structure under the influence of the Internet technology, which is manifested in the fact that the Internet platform side has structured the transaction process, adopted the market mechanism to deal with the lower transaction costs, and adopted the enterprise integration mechanism to deal with the higher transaction costs. The endogenized progress to reduce transaction costs leads to the dual attributes of the Internet platform as a market and an enterprise; the superficial way for the Internet platform to reduce transaction costs is to cope with the three relationships generated between transaction entities. Then the basic functions of information search, social networking and e-commerce are guaranteed. Due to the completeness of information and value exchange, the Internet platform can establish an online closed community supported by technology. In addition to the reduced transaction cost, the source of value also includes the transfer of some resource dominance in the online platform, and members pay a certain amount to control to increase revenue or utility, while the expected maximum value grows as the platform expands. In the multi-sided market integrated by the Internet platform, the heterogeneous platform members in different markets are evidenced by a variety of the cross-network effect of different markets, producing an impact on the expansion effect of the Internet platform.

Conflicts of Interest

The authors declare no conflicts of interest.

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