

## A Validity Study on the Electronic Commerce Mode and Informatization Construction in the Perspective of Value Chain

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**Abstract**—Electronic business activities of enterprise are changing the value creation process on every link of enterprise supply chain based on the rapid development of information technology. Constant innovations of electronic business model has had a powerful impact upon the traditional business model, and produced complicated influences on ERP platform interface of the enterprises and suppliers. Based on the value chain perspective, this paper makes data analysis by applying panel data model to electronic business model and enterprise informatization construction situation. The results show that the information construction of the case enterprise has promotive effect in analyzing the profitability of B2B, BMC and B2G models. Enterprise's information construction has limited positive facilitation to B2C mode, and negative effects may emerge because of cost problem.

**Keywords**—Electronic commerce mode; Value chain; Informatization construction

### I. INTRODUCTION

Enterprise electronic commerce is a mature business model relying on the rapid development of information technology and developed countries take it as a new means of international trade and expand its application scope. The rapid development of electronic commerce in the global scope produces strong impact on the traditional business model, promotes the development of enterprise informatization direction, innovates the connotation of enterprise value creation, and changes the enterprise value chain composition. For instance, the unknown Ali group ten years ago becomes China's largest electrical contractor with its electronic business supervision platform and fundamentally changed modern business transaction pattern. In the choice of the electronic commerce mode, enterprises must consider the construction planning of enterprise information, as well as the influence on other business in the enterprise value chain. Therefore, the enterprise electronic commerce mode choice will enforce the reengineering and optimization of other business in enterprise value chain, especially enterprise ERP and OA information construction.

### II. NEGATIVE EFFECTS OF ELECTRONIC COMMERCE ON ENTERPRISE OPERATION

Enterprise value chain is an organic value creation system. In this system, the sales model would inevitably

coordinate and operate with finance and production. The mode change of electronic commerce will involve the business activities of the whole enterprise. Relying on the information technology, electronic business expands the sales channel mode for enterprise and changes the enterprise' traditional business mode and profit mode. Online trading can be achieved between enterprises, and enterprise and consumer through ERP and trading software, which can greatly shorten the transaction time and expand the trade radius. In 2012, for example, TaoBao and Sky Cat once again broke the record to 19.1 billion on the double eleventh day, equivalent to a month' sales of large entity shopping mall. The rapid development of electronic commerce constantly creates legend records, as well as negative effects on enterprises.

First of all, enterprise is passively bound with online mall interests, becomes victim in fierce online mall competition, and loses the enterprise profit space. Limited by capital and technology, most enterprises cannot set up independent network transaction platform to realize B2C and B2B and other electronic business models, especially large numbers of small and medium-sized enterprises. The current most enterprises mainly rely on Alibaba, JingDong and other large mature sales network platform for electronic business transactions, the enterprises are forced to bind with online mall interests. And the malpractice of interests bound, as the supplier of the enterprise, must take the brand value and profit margins as stakes to fight against electric business.

Second, most enterprises adopting B2B e-commerce mode need to invest a lot of money and technology running from research to trading platform, but the influence and trading volume are very limited after running trading platform operation. Current market of network transaction platform in our country is mainly occupied by TaoBao, JingDong and Tencent, although Su Ning Electrical Appliance has expanded market share after moving online, but did not achieve the expected profit growth, and fell in negative news of electrical business war and false price more deeply. Many enterprises realize electronic business transactions in supply chain upstream and downstream through the purchase of ERP software, but ERP software requires operating personnel with high English level and operation practice experience, so many enterprises are limited by the ability of his employees, and put aside informatization plan after buying ERP software.

Finally, the development of electronic commerce enterprise increases enterprises' survival risk. In the vigorous development time of electronic commerce, the famous brands management ten years ago appear polarization, such as the decline of Motorola's mobile business and the overwhelming market possession of Apple mobile phone. Millet mobile phone initially depended entirely on the network sale has become a youngsters' pet. The enterprise electronic commerce mode not only influences the enterprise marketing mode, but also affects all the aspects of its value creation.

### III. THE CORRELATIONAL STUDY OF ELECTRONIC COMMERCE MODE AND ENTERPRISE INFORMATIZATION

This research collected the third quarter of quarterly report and business data of the case enterprise from 2010 to 2012, and apply panel data model to the analysis of the collected data.

#### A. 3.1 Data sources

This study takes the typical multi-mode operational marketing enterprises as the case enterprise. The case enterprise mainly engages in office supplies manufacturing, office equipment research and development, manufacturing and sales. Case enterprise realizes the B2B e-commerce mode in whole supply chain upstream and downstream through the combination of its suppliers and main customers. Case enterprise constantly innovates electronic business model. New sales channels are expanded through the strategy of various e-commerce modes combination. The main means is to sell goods through B2B and B2C modes on the companies' websites, achieve B2C mode through authorizing sales center via Sky Cat and JingDong, and achieve C2B model through the 360 group-buying web sites. This research collected sales, cost, net income and financial data achieved through different channels of the case enterprise, and collected enterprise informatization construction cost and customer platform visit data for the realization of multi-mode marketing. In order to ensure the accuracy and reliability of data, the financial report of the case enterprise comes from Shanghai exchange website, and other data were collected through follow-up investigation method.

#### B. Model variables

This research mainly studies the correlation between different electronic commerce profit models and enterprise information construction effectiveness. Of the different electronic commerce modes in the third quarter of 2010 to 2012 of the case enterprise, quarterly net profit  $y_i$  is taken as dependent variable, enterprise information construction investment  $x_1$ , enterprise trading platform customer visit person-times  $x_2$ , deal orders per hour  $x_3$  as independent variable, input cost and total assets ratio in e-commerce transaction platform  $x_4$ , and enterprise investment research personnel and the total number ratio  $x_5$  as control variable.

#### C. Mathematical model

This study adopts panel data model to study the influence of developing enterprise informatization on different e-commerce profit modes of the enterprise. Different e-commerce profit modes are as follows:

$$y_{it} = \alpha_{it}e + x_{it}\beta_{it} + \mu_{it} \tag{Formula 3.1}$$

In which,  $i = 1, 2, \dots, N, t = 1, 2, \dots, T$ .

In formula (3.1),  $y_i$ , the dependent variable, is the profit situation of the different electronic business models in T quarters.  $x_i$  is the independent variables and control variables of  $k \times 1$ .  $\alpha_{it}$  is the constant term of the model.  $\mu_i$  is random variable error term independent of each other. The regression form of the matrix of formular (3.1) is:

$$\begin{pmatrix} y_1 \\ y_2 \\ \vdots \\ y_N \end{pmatrix} = \begin{pmatrix} \alpha_1 e \\ \alpha_2 e \\ \vdots \\ \alpha_N e \end{pmatrix} + \begin{pmatrix} x_1 & 0 & \dots & 0 \\ 0 & x_2 & \ddots & \vdots \\ \vdots & \ddots & \ddots & 0 \\ 0 & \dots & 0 & x_N \end{pmatrix} \begin{pmatrix} \beta_1 \\ \beta_2 \\ \vdots \\ \beta_N \end{pmatrix} + \begin{pmatrix} \mu_1 \\ \mu_2 \\ \vdots \\ \mu_N \end{pmatrix} \tag{Formula 3.2}$$

To test model, the sum of squared residuals of the formula (3.1) is calculated. If

$$\begin{aligned} W_{xx,i} &= \sum (x_{it} - \bar{x}_i)(x_{it} - \bar{x}_i)' \\ W_{xy,i} &= \sum (x_{it} - \bar{x}_i)(y_{it} - \bar{y}_i)' \end{aligned} \tag{Formula 3.3}$$

In it,  $x_{it} = (x_{1,it}, x_{2,it}, \dots, x_{k,it})'$ ,  $\bar{x}_i = \frac{1}{T} \sum x_{it}$ ,  $\bar{y}_i = \frac{1}{T} \sum y_{it}$ . The sum of squared residuals of the formula (3.1) is as follows:

$$S_1 = \sum RSS_i = \sum (W_{yy,i} - W_{xy,i}' W_{xx,i}^{-1} W_{xy,i}) \tag{Formula 3.4}$$

Confidence is judged by the sum of squared residuals obtained from the calculations so as to determine whether to accept the relevant inspection.

### IV. THE EMPIRICAL RESEARCH OF ELECTRONIC COMMERCE MODE AND ENTERPRISE INFORMATIZATION

#### A. Descriptive analysis

TABLE I. DESCRIPTIVE RESULT

index	value	index	value
Mean dependent var	3.0238	S.D. dependent var	3.2238
S.E. of regression	2.3426	F-statistic	122.4211
Sum squared resid	92.21	Hausman criter	2.221

From table 1, this research model has passed Hausman information standards inspection from Hannan - Quinn criter numerical value. This shows that the model this study developed is suitable for the analysis of survey data collected.

According to the calculated results, the model results evaluation value , actual value and residual value are compared, as in figure1.

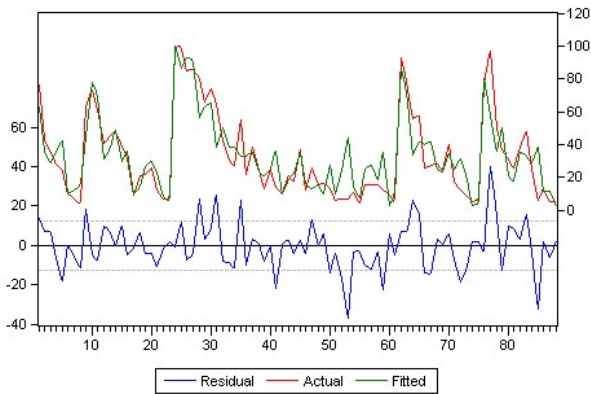


Figure1. Evaluation value , actual value and residual value

B. Empirical result analysis

TABLE II. ANALYSIS RESULTS OF SMALL AND MEDIUM-SIZED ENTERPRISE ACCOUNTING INFORMATIZATION RESEARCH

Sample: 2009 2011				
Included observations: 30				
Convergence achieved after 4 iterations				
Variable	Coefficient	Std.Error	t-Statistic	Prob.
u <sub>i</sub>	0.5347	0.4635	10.0237	0.0068
x <sub>1</sub>	0.4225	0.5253	8.9238	0.0088
x <sub>2</sub>	0.5216	0.3386	3.3222	0.0472
x <sub>3</sub>	0.3786	0.0133	6.0733	0.0412
x <sub>4</sub>	0.6785	0.6224	11.3421	0.0322
x <sub>5</sub>	0.5757	0.2284	10.2123	0.0253

From table 2 the regression model is as follows  

$$\hat{y} = 0.5347 + 0.4225x_1 + 0.5216x_2 + 0.3786x_3$$

$$+ 0.6785x_4 + 0.5757x_5 \quad \text{(Formula 4.1)}$$

From table 2 and formula (4.1), it can be seen that the net profit of B2B and BMC modes are influenced greater whereas B2G and B2C have less effect. Case enterprise strengthens the terminal consumer buying influence through the BMC e-commerce mode and the enterprise's retail performance has improved because of the development of BMC electronic commerce mode. Case enterprise enhances the cooperation between government and business through informatization construction. The enterprise can provide rapid response and deal with government procurement plan more quickly with information construction. Informatization construction promotes enterprise B2B model too. By building network platform ,the enterprise promotes trading efficiency between enterprises and shorten the transaction process and delivery check-out time, and provides a real foundation for the competition mode between enterprises.

Although the informatization construction plays a promoting role in enterprise B2B, BMC and B2G model of profitability, enterprise's B2C model has little effect. Enterprise increased the cost by 5.20% in broadening the channels for consumers, but the net profit increase by less than 2%. The enterprise has very limited promoting space by choosing B2C mode. In the future of end market competition, enterprise B2C platform informatization may influence its competence by taking up too much fund.

From the results of the study,it can be seen that the following aspects should be paid attention to in selecting enterprise information construction planning and e-commerce mode selection. First, while the enterprise choose electronic commerce mode, information construction planning should be carried on. While developing e-commerce strategy, consideration should be given to the influence of the electronic commerce on enterprise value chain and the influence of different electronic business model on each link of value creation in enterprise operation. Enterprise should be rational in electronic business model innovation, give full consideration to the load bearing capacity of the existing information system, and whether the informatization construction planning can adapt to the new business model or not. Second, in the management of automation, the enterprise shall not only pay attention to high performance and new market opportunities, but also the effective connection between each link of the enterprise, especially if the operators transferring real-time documents information between enterprises can be proficient in dealing with work informatization. At present, domestic ERP software are mostly English version, especially the international trade enterprise ERP module. The efficiency of electronic transactions is determined by the staff's English proficiency level and the enterprise shall strengthen operating personnel's English skill training so as to cooperate ERP effectively with electronic business model. In the economic globalization background, the enterprise implementing ERP full e-commerce mode is a new method responding to the rapidly changing of global market. The enterprise shall pay more attention to the latest mobile e-commerce and other new models so that the enterprise can survive long-termly in the rapid development of information technology environment.

V. CONCLUSION

The progress of science and technology has a growing impact on enterprise marketing mode. The marketing mode innovation is a favorable tool to maintain the enterprise's market share. Through the empirical study of the enterprise informatization construction and e-commerce mode selection, enterprise technology platform competition is objectively evaluated and provide a favorable basis for enterprises to choose the appropriate mode of electronic business affairs. Thereby the enterprises in electronic commerce war can keep the core competitiveness and enhance the enterprises' adaptation in market changes.

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