CHINA E-COMMERCE MARKET ANALYSIS: FORECASTING AND PROFILING INTERNET USER

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ABSTRACT

E-commerce has been increasing rapidly and obviously will be more popular in the future. The growth of internet is believed has given impact on e-commerce's growth in China because approximately thirty percent Chinese alter to be active internet users. The trend is obviously pointed out the increasing of e-commerce transaction value. This research aims to provide insight to Chinese e-commerce market by performing forecast of internet user. Age, gender, and income, as part of demographic profiles, are selected since they are considered positively influenced internet user's online activity. Furthermore, this research also provides analysis as guideline for companies that want to enter China e-commerce market. For the purpose of this research, time series analysis using ARIMA model will be used as research method. Overall, findings assert Chinese internet users seem grow rapidly. Male is still predicted dominate market although, surprisingly, the result shows male user internet is going down gradually by 2015. In addition, the result shows internet users who have high income is increasing. Therefore, it is indicated that luxuries products become potential products to be marketed. Considering overall phenomenon, it is likely that China will still continue to be a prospective e-commerce market in the future.

Keywords: Forecasting, Profiling, E-Commerce, Demographic Profile, Arima.

Introduction:

E-commerce not only contributes to better economic condition (United Nations Conference on Trade and Development, 2002) in developed countries but also important to assist developing countries to gain higher economic development. Given accessibility and many advantages by the presence of internet, it simultaneously boosts the growth of e-commerce. E-commerce affects almost all scope in countries; mostly positive widespread impacts on developing countries. Moreover, e-commerce held by companies is triggered by necessity to create consumer's satisfaction since consumers are frequently recognized as the main participant to improve companies' performance (Turban et al., 2006). China as one of developing countries shows the significance progress of e-commerce market from 2008Q1 to those in 2010Q1 (Trippon, 2010). Even though internet penetration in China is lower compare to those in developed countries, the number of in China shifting the highest proportion among other countries (Kuek, 2010). The number of internet user, however, represents only 30% of total population and indicating the huge possibility for gaining profit. As this phenomenon gain momentum, understanding the future of Chinese internet user's online pattern has become crucial and increasingly urgent. In spite the optimism of China e-commerce market, there is remarkably few research discuss internet users' profile. In view the fact of tremendous growth potential market, this research highlights the growth of China e-commerce market by forecasting and profiling China internet user. The main objective of this research is to provide better insight of internet user's growth and internet user's profile in China, specifically for companies, before they decide to enter market in China.

Literature Review:

There have been very few literature that have focused on internet user profile, even though there have been earlier studies that address and analyze e-commerce. Analyses of e-commerce market in China should begin with an understanding of Chinese internet user. Internet user in every country has its own characteristic that differs from other countries. This is consistent with Lynch and Beck (2001) who emphasized that internet user profile consequence affects decision to perform e-commerce. Insight based on consumer profile as basic information is extremely important for identifying consumer's characteristic (Jansen, 2007). It can be determined from several considerable factors, for example demographic profile which important to enhance success e-commerce in companies (Laosethakul, 2005, Turban et al., 2006) since difference in age, gender, and income indicated different concern in e-commerce (Zou, Wang, Xu, 2006).

Several researches related with online shopping activities exert that demographic profile have correlation with the usage of internet. For example, gender was considered associated with consumers' online shopping behavior (Haque, Sadeghzadeh, Khatibi , 2006). Therefore, forecasting gender to get better insight on internet user's profile is essential (Wei and Feinberg, 2004). Male internet users had tendency to perform online shopping since they more aware of technology (Furuholt, Kristiansen, and Wahid, 2005, Hashim, Ghani, and Said , 2009, Dİncer, 2008). Another aspect concerning e-commerce is income level (Haque, Sadeghzadeh, Khatibi , 2006). This finding is similar with research conducted by Akman and Rehan (2010), Furuholt, Kristiansen, Wahid (2005) which supposed the importance of income to online shopper. Different aged group also perform different online activities' pattern. Young internet users appeared to covers digital marketplace Furuholt, Kristiansen, Wahid (2005), (Dİncer, 2008). Nevertheless, the most online shopping was conducted by internet user with age 30-39 years old (Hashim, Ghani, and Said, 2009).

Globally, Panagariya (2000) believed that developed countries are able to gain advantage in short term, while developing countries will gain more in long term. The growing of internet users are thus becoming tied with consumption scale, apparently pattern similar to that which has occurred in China but more extreme (CNNIC). A similar trend is asserted by Wei and Feinberg (2004) who found

that Chinese internet user likely increase in 2005. E-commerce development in China was estimated increase and cover global market in the future (Ki, Leung, Leung, 2006). Interestingly, recent findings by Trippon (2010) asserted the growth of e-commerce market in China is extremely fascinating since the growth is four times more in 2010 compare to those in 2008.

Research Design:

In order to perform forecasting, time series analysis using ARIMA (Autoregressive Integrated Moving Average) model will be utilized. The two main points to be projected are the number of internet user and the number of internet user from demographic factors. For demographic profile, three aspects are chosen: age, gender, and income.   Observations data are collected from semiannual CNNIC report. CNNIC (China Internet Network Information Center) was established on June 3rd 1997 as a non-profit organization. This organization has the most authority to conduct statistical survey related internet development in China. Sample for this research objective is CNNIC's reports from year 1999 to year 2010. ARIMA (p, d, q) is symbolize p as degree of autoregressive, d as level of differencing and q as degree of moving average. Mathematical function can be seen below:

AR (p): $Yt = \theta_1 Yt\text{-}1 + \theta_2 Yt\text{-}2 + \ldots + \theta_p Yt\text{-}p + \delta + \varepsilon_t$

MA (q): $Yt = \mu + \varepsilon_t - \theta_1 \varepsilon_t\text{-}1 - \theta_2 \varepsilon_t\text{-}2 - \ldots - \theta_q \varepsilon_t\text{-}q$

ARMA (p, q): $Yt = \theta_1 Yt\text{-}1 + \ldots + \theta_p Yt\text{-}p + \delta + \varepsilon_t - \theta_1 \varepsilon_t\text{-}1 - \ldots - \theta_q \varepsilon_t\text{-}q$

ARIMA (p, d, q) : $\Sigma (\delta Yt)$

To choose the best model of ARIMA, there are four steps to perform: Identifying process, estimating model, diagnostic checking process, and forecasting (Arsyad, 2001, Winarno, 2009, Nachrowi and Usman, 2006). According to Yorucu (n.d) and Arsyad (2001), forecasting error could be determined from Root Mean Square Error (RMSE), Mean Absolute Error (MAE), Mean Absolute Percentage Error (MAPE), and Theil Inequality Coefficient.

Finding and Results:

The major research question in this study is to explore internet user's trend in 2015. Since this research also determine internet user from demographic profile, age, gender, and income are forecasted as well. The forecasting result of internet user and its demographic profile can be seen in Table 1. In general, all evidence indicates that internet users will grow progressively in the next five years. Several aspects concerning demographic profile tend to increase while the others are likely stay stagnant or decrease steadily.

Table 1. Result Of Forecasting Using ARIMA Model

ARIMA model	Indication	Forecast Error			
		RMSE	*MAE*	*MAPE*	*Theil Inequality Coefficient*
Interenet user (1,0,0)	Increase	16923541	11848619	11.9	0.04
Female (2,0,2)	Stagnant	0.03	0.02	6.2	0.03
Male (1,0,0)	Decline gradually	0.02	0.02	4.1	0.02
Age < 21 years old (1,1,1)	Increae	0.07	0.06	32.8	0.15

ARIMA model	Indication	Forecast Error			
		RMSE	*MAE*	*MAPE*	*Theil Inequality Coefficient*
Age 21-30 years old (1,0,2)	Stagnant	0.05	0.03	5.9	0.1
Age > 30 years old (1,1,1)	Decline gradually	0.05	0.04	23.2	0.1
Income < 501 yuan (1,0,0)	Stagnant	0.05	0.03	26.6	0.1
Income 501- 4000 yuan (1,0,0)	Stagnant	0.06	0.04	7.3	0.04
Income > 4000 yuan (2,1,2)	Increase	0.01	0.01	22.4	0.15

Table 1 presents forecast result of Chinese internet user. According to Yorucu (n.d.) and Arsyad (2001), if MAPE value less than 10% means that forecasting result is accurate. Between 10 to 20% suggest forecasting value is good, between 20 to 50% indicate forecasting is quite accurate and above 50% imply forecasting is absolutely incorrect. Furthermore, Yorucu (n.d.) also stated that theil inequity coefficient that always lies between 0 and 1 shows whether model is appropriate or not for predicting, where 0 means model is appropriate and 1 indicate model would provide inaccurate forecasting result. From this viewpoint, ARIMA model is already appropriate to predict trend of internet user in the future.

Discussion:

Chinese internet user is estimated will reach 1.53 billion by 2015, tripled growth compare to those in 2011. The similar growing pattern is consistent with Wei and Feinberg's research (2004) that asserted drastic increasing of internet user in 2005. This dominant use pattern of Chinese speaking internet users were predicted covering up most of internet user worldwide.

It is likely that since 2000, female internet users are growing bigger. There are several advantageous reasons for women to use internet, for example to obtain better knowledge, conduct online business activities, build network by join online activities, and so forth. The current development presents active contribution of e-commerce by women. Opposing to the fact, male's consumption will still higher compare to female's consumption. It means male internet users will still dominate e-commerce market. In summary, the trend of male internet user seems decline gradually while female internet users tend to stagnant in the next five years.

Meanwhile, by looking to age aspect, result indicates that internet users from age under 21 show growing trend. Initiating by countless information from entertainment, education, instant messaging, social networking, e-mail, etc, the trend are constantly shaped. The trend of 21 to 30 years old internet users, by contrast, appears steady. The result is in line with Taylor et al (2003) and Dİncer's result (2008) who analyzed that young internet user were quite active in conducting internet for many purposes, such as education, entertainment, and online search. Surprisingly, the usage of internet by internet user from age above 30 years old seems decline for the next 5 years. Elder people had tendency to perform limited online activity, mainly is sending e-mail Hashim, Ghani, and Said (2009).

The growth of internet user with income under 500 yuan and 501 to 4000 yuan are relative constant until 2015. It is interesting to notice growing progress of high income internet users that creating internet user eager to consume more. Based on the trend, exclusive and expensive products have big opportunity to be marketed on China e-commerce market. This direction was also anticipated

by Gladwin and Porritt (n.d.) who discovered high demand of luxury products for approximately 29% of global luxury sales. It means Chinese consumption of luxury goods will unpredictably go beyond U.S. and Japan.

Conclusion and Limitation:

In the last four year, Chinese show higher consumes of internet and mostly Chinese alter to active e-commerce users. This research examines growth of internet user in general and specifically, from demographic profile. The internet consumption pattern of Chinese currently seems increase to a great extent. The higher online hour initiate promising advantage for companies. The number of internet user is predicted will reach approximately 1.53 billion internet users by 2015. Since consumption pattern of internet continues to climb, so too has the growth potential of China e-commerce market. Consumption of male internet users thus are predicted still has higher percentage even though female internet users potentially catch up male internet user. More than half of digital consumption likely comes up from those aged 21 and under with potential e-commerce products related to entertainment and education scope. Growing and spending pattern of high income internet users should be anticipated by companies. It is therefore useful or even necessary to give more attention to the demand of luxury products. Companies who would like to engage in China market need to frame and grasp the prospective opportunity.

There are several issues that need to be addressed in the future research. The usage frequency of internet by internet users should be forecasted to provide better indication of trend on e-commerce market. Understanding increasing trend of website in number or percentage and online advertising are important to convince prospective e-commerce market. The usage of internet geographically is also necessary to figure out tendency of potential e-commerce in each city, particularly in rural areas. Availability of more detailed data will assist better forecasting and also provide deep analysis related to China e-commerce market.

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