Online shopping diffusion in China

- A study of factors that influence adoption

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Abstract

Online shopping was introduced in China in late 1998 and saw rapid growth during the past ten years. This paper applies Roger's Innovation Diffusion Theory and David's Technology Acceptance Model to study what factors may influence the adoption of online shopping in China. In particular, the paper explores whether there are factors that influence the adoption of online shopping in contemporary China which are not acknowledged by previous theory. After analyzing data collected from 600 university students, some characteristics of current patterns of online shopping adoption in China are concluded. Fashion is added as a new factor that motivates Chinese consumers to choose online shopping. A logit model is adopted to present the correlation with demographic variables in this study.

Key-words: Online shopping, innovation diffusion theory, fashion driven
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Abstract

Online shopping was introduced in China in late 1998 and saw rapid growth during the past ten years. This paper applies Roger's Innovation Diffusion Theory and David's Technology Acceptance Model to study what factors may influence the adoption of online shopping in China. In particular, the paper explores whether there are factors that influences the adoption of online shopping in contemporary China which are not acknowledged by previous theory. After analyzing data collected from 600 university students, some characteristics of current patterns of online shopping adoption in China are concluded. Fashion is added as a new factor that motivates Chinese consumers to choose online shopping. A logit model is adopted to present the correlation with demographic variables in this study.

Key words: Online shopping, innovation diffusion theory, fashion driven
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1. Introduction

After the invention of a new technology, it normally takes a long period for this new technology to be widely diffused and used. But the economic value of this new technology can only be realized after this process. Thus the diffusion of a new technology plays a very important role in contributing the economic growth.

The Technology Acceptance Model (TAM) developed by Fred Davis and Richard Bagozzi is a theory and model that based on the factors which may affect individuals' decisions of whether and how to accept and start using a new technology after its appearance in the market.

Innovation Diffusion Theory raised by Everett Rogers is a theory that tries to explain the process of how and at what rate new ideas and technologies spread out in a social system.

These two theories are based on different aspects of innovation diffusion and focus on the different factors that may influence the technology adoption. The former one applies a microscopic perspective, in which it mainly studies the individual's behavior while the latter one describes evolvement of a social system. I will use both of them to analyze the diffusion of online shopping in China.

Online shopping first started in 1994 when Pizza Hut started an online ordering service on their webpage in USA. Another early actor was Amazon, which started selling real tangible products through websites, and eBay started online auction (Amazon's 15th anniversary: A brief history of online shopping. Time, July 16, 2010). According to 2003-2010 Annual Report of international Electronic Commerce by Chinese Electronic Commerce Research Center, with the wide diffusion of Internet banks as well as the development of express delivery industry, in 2002, the turnover of online shopping in USA reached the level 14
billion USD. And this number kept on increasing by 15% annually during the following 6 years.

In China, the first online deal was realized in 1998. In 1999, with the establishment of the first B2C website 8848.com, China gradually stepped into its own online shopping era. After the downturn of the market in 2001, Taobao created a special C2C operation model which helped its market share jump from 8% to 59% between 2003 and 2005 (China online shopping research report, iResearch, 2006). By 2007, the turnover of online shopping in China reached 56.1 billion RMB (around 6.3 billion Euros), with an increasing rate of 117.4% comparing with 2006. In 2010, there are more than 148 million online consumers with a total turnover of 57 billion Euros in the Chinese online shopping market (Annual Report of Chinese Electronic Commerce development).

It is obvious to see that online shopping industry is growing fast all around the world, also in China, especially in the late five years. And it is interesting that many European countries saw an earlier start in e-commerce than China but seem to experience a relatively slow development, while China gets a later start, but achieves a rapid development. So what factors may cause this phenomenon? This thesis presents a study on the factors that have driven the explosion of e-commerce in China guided by the innovation diffusion theory and technology acceptance model. The theoretical ambition of the thesis is to investigate whether the spread of online shopping in China fits these modeling approaches or not, and what other factors that can be added to increase explanatory power.
2. Theoretical Analysis

Innovation Diffusion theory was first generalized by Everett Rogers in his book Diffusion of Innovations (1962), describing how new ideas and technologies spread out in different cultures. The original research is about the purchase of hybrid seed corn by farmers. This model has been further developed and widely used in the new technology adoption area.

In his book, Rogers defined diffusion as the process in which innovation is communicated through certain channels over time among the members of a social system. And each individual in this social system will make the choice and decision by following a five-step process:

1. Knowledge, which means that the individual first start getting to know a new technology or innovation, but limited to just have a basic and general idea of how it functions.

2. Persuasion. In this stage, the individual will form an either favorable or unfavorable attitude towards the innovation after studying more information and details of it.

3. Decision. It is the stage that the individual comes to a decision of whether to adopt or reject the innovation by comparing the advantages and disadvantages of using the innovation.

4. Implementation. In this stage, the individual puts the innovation into use.

5. Confirmation, which means the individual will decide whether to continue using the innovation or stop after evaluating the results achieved by trying the innovation.
Most members in the society make their decisions about adoption of an innovation by the influence of other members' decisions. Roger categories these adopters into five groups according to their response and behavior when the innovation occurs.

1. Innovators: the individuals who first decide to adopt an innovation
2. Early adopters: the individuals whose decisions are affected by the innovators after analyzing their utility of adopting an innovation.
3. Early majority: The people in this group are cost sensitive and need a solid beneficial proof to react but easily convinced when they find the innovation works well with early adopters.
4. Late majority: The individuals who are reluctant to accept new ideas but still decide to adopt the innovation because of the concern of following the mainstream.
5. Laggards: people in this group are really unwilling to change or challenge. They fear a lot when they have to start accepting the innovation.

The Technology adoption life cycle model is used to describe the adoption of innovation according to these five adopter groups. Roger's Bell curve is introduced as graph 2.1.
Roger presents an s-curve as an addition to show the time pattern of the innovation adoption. See graph 2.2 below. It starts with a slow and gradual growth with the innovators and early adopters, and then comes to a rapid growth period because the early adopters start adopting. Followed by a relative slowdown with the late majority, it finally comes to an upper asymptote, when the diffusion is complete.
Roger lists five main intrinsic factors of an innovation that influence individuals' decision of whether to accept or not:

1. Relative advantage: if an innovation is considered better than the previous one.
2. Compatibility: if an innovation is perceived as being consistent with the value, past experiences, and the potential adopter's need.
3. Complexity: if an innovation is easy to understand and use.
4. Trialability: if an innovation can be examined and experimented on a limited basis.
5. Observability: if other individuals can observe the result of an innovation easily.

If an invention is relatively better than the old technology, goes well with the value and people's need, easy to use, to be experimented to see the result, it will spread out rapidly in a society.

The innovation diffusion theory is based in a social system but does not explain the individual's acceptance process of innovation. So now we introduce the Technology Acceptance Model, which lists two major factors that influence the individual's attitudes toward a new technology, thus influence their decisions of whether to accept or reject it.

1. Perceived usefulness, which is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" by Fred Davis.

2. Perceived ease of use, which means "the degree to which a person believes that using a particular system would be free from effort".

Building on the basic theory of both innovation diffusion theory and technology acceptance model, I now turn to the analysis of the development of online-shopping in China, using both theories to see which factors influence online shopping diffusion under Chinese situation.
3. Research background and literature review

When online shopping first started spreading out in the market as a new consumption pattern, it got a lot of attention by researchers due to its innovative features and rapid growth. These studies mainly take the perspective of consumers’ online shopping behavior to investigate the factors that may influence its adoption.

Because consumers' decision of adopting online shopping is a complex decision process, most researchers use more than one or a series of theories and models to make it better explained, which mainly include: the Theory of Reasoned Action, the Technology Acceptance Model, Transaction Cost Theory, Innovation Diffusion Theory and etc. A number of these studies are based on consumers' online shopping behavior and some main focus on the online shopping intention or attitude, thus in most studies, the theoretical frameworks are a combination of several theories. But in this paper, I will mainly focus on the Innovation Diffusion Theory and Technology Acceptance Model.

3.1 Innovation Diffusion Theory

Rogers (1983) discussed the factors relative advantage, compatibility, trialability, observability and complexity as the main attributes of an innovation in his Innovation Diffusion Theory. Dearing et al. (1994) added applicability and reliability as other important attributes for the diffusion of risky innovations. As this study also measures if an innovation is high risky or low risky, it actually added risk as a potential attributes for diffusion.

Other factors that are found important are usability and sociability by March (1994), socio-economic and demographic factors (Bulte, 2000) and
communicability (Goldsmith and Witt, 2005). But considering the different features of the innovation itself, the factors that affect the innovation diffusion process may be different as well. For instance, March (1994) mainly focuses on the newly user centered product design, Goldsmith and Witt (2005) mentioned the communication by consumers while study the consumer opinion leadership by analyzing the product: snack food, CDs and skin products. Bulte (2000) states that "economic conditions and demographic change are related to diffusion speed", but it is more based on a relative long time period comparing to the other studies. But for some new invention like Internet or online shopping which spread out in a society in a short period, these factors may not influence much.

3.2 Technology Acceptance Model

After the original Technology Acceptance Model was proposed by Davis (1989), many researchers have contributed to either testing or expanding it. Segars and Grover (1993) proposed a different model based on (1) Usefulness, (2) Effectiveness, (3) ease-of-use after testing a replication of Davis' model. Keil et al. (1995) developed Davis' model further and proposed a Usefulness/Ease of use Grid; a 2X2 grid of different combination of two attributes to find the relation between these two factors and found perceived ease of use also a function of task fit. But the study is based on information systems, and may not valid for the other new technologies. Venkatesh (2000) and David extended it and raised a second version of the model that explains perceived usefulness and usage intentions regarding social influence and cognitive instrument processes. And this extended model is supported by the test of both voluntary and mandatory settings of four different systems.
3.3 Innovation Diffusion Theory, Technology Acceptance Model are used in the research of online shopping.

Verhoef and Langerak (2001) studied the advantages and disadvantages of online grocery shopping and traditional in-store shopping, using a sample of 415 households in Netherlands. They investigated the impacts of perceived relative advantage, compatibility, and complexity on consumers' intentions to purchase grocery online and concluded that consumer's perception of the relative advantage and compatibility positively influence the adoption rate, and the compatibility of grocery online shopping negatively influences the consumers' intention. Age, income, education are also included to moderate the model.

Verhoef and Langerak (2001) use Innovation Diffusion Theory Rogers (1983) because they consider the characteristics that Rogers (1983) distinguishes in his theory can be related to electronic grocery shopping as well. But they mainly test three of the factors: relative advantage, compatibility and complexity, which are more related to consumers' perceptions prior to using an electronic grocery shopping service, since it main focuses on consumers' behavioral intentions to adopt online shopping instead of the actual adoption. The results show that “convenience is a decisive factor in determining consumers' perceived relative advantage and compatibility of electronic grocery shopping”.

Childers et al. (2001) related the consumers' attitude toward shopping on line with the Technology Acceptance Model where they refer the ease of use as the “process of using the new media while engaging in shopping behavior”. Besides, they include the factor 'enjoyment', which is added to the original model by Davis et al. 1989. They argued that the motivations for consumers to shop online are both utilitarian and have an hedonic dimensions of the retail atmosphere after studying the online shopping as a new web media. Navigation, convenience and the substitutability of personal examination are also the predictors. This study is more focused on the consumers’ psychological motivations, since enjoyment is a
main factor being discussed in the study.

Chen, Gillenson, and Sherrell (2002) incorporated Innovation Diffusion Theory in the Technology Acceptance Model due to the several similarities of the two theories. They study the consumers' behavior in the virtual store context, and combine the Innovation Theory and Technology Acceptance Model, concluding that compatibility, usefulness, and ease of use are the main factors that entice the consumers to use a virtual store instead of a physical store. In this research, technology acceptance model is actually used as the main theoretical foundation while innovation diffusion theory is just a complement of it. Thus, other factors (i.e. relative advantage, complexity, triability and observability) that may influence the adoption are not discussed.

Eastin (2002) investigated the adoption of four e-commerce activities (1) Online shopping, (2) online banking, (3) online investing, (4) electronic payment in the USA, using Innovation Diffusion Theory and get the result that six attributes including: perceived convenience, financial benefits, risk, previous use of the telephone for a similar purpose, self-efficacy, and internet use all influence the adoption process, and that once the user made a decision to adopt one of these activities, they tend to adopt another. The model is extended after assessing possible negative outcomes of diffusion in the study as well.

Liu and Wei (2003) developed a theoretical model of consumers' E-commerce adoption intention to study the product differences in consumers' E-commerce adoption behavior. Perceived usefulness, perceived ease of use and perceived risk are studied in this research as the main motivation of consumers' E-commerce decision. They choose books and bank services as the example of goods and service and use the sample of 308 university students in the USA to do the survey, get the result that consumer's E-commerce adoption decision is strongly influenced by perceptions of risk when consider purchasing goods, but when consider buying service, consumers' perception of ease of use influences
Henderson and Divett (2003) studied a research sample which consists of 247 valid questionnaires of potential customers of an electronic home shopping service in New Zealand and tested the electronic supermarket of the relationship between the perceived ease of use, usefulness and three electronically recorded indicators of use from the Technology Acceptance Model then got the result that the Technology Acceptance Model could explain up to 15% of the consumers' decision of purchasing in the electronic supermarket.

Van der Heijden et al. (2003) used (1) technology-oriented perspective and (2) trust-oriented perspective to investigate online purchase intention, after studying the perceptions of 228 undergraduate students in a Dutch academic institution, their attitudes and intentions of purchasing CDs online, got the result that trust-antecedent 'perceived risk' and the technology-antecedent 'perceived ease-of-use' directly influenced the attitude towards purchasing online. In this research, the factors that influence the consumers' decision is distinguished by technology and trust perspectives.

O'cass and Fenech (2003) directly applied the Technology Acceptance Model to investigate online shopping behavior to examine Internet users' adoption of the web for retail usage. After testing 392 responses' online shopping behavior in Australia they found that the users' perceived usefulness and perceived ease of use were affected differentially by consumers' characters, such as Opinion Leadership, Web Shopping Compatibility, Internet Self-Efficacy, Perceived Web Security, Impulsiveness, Satisfaction with web sites and Shopping Orientation.

Shih (2004) proposed an extended model to predict consumers' acceptance of E-shopping based on Theory of Reasoned Action and Technology Acceptance Model. He analyzed a sample of 212 questionnaires filled in by office workers in Taiwan. The test results show that the consumers' attitudes toward online
shopping strongly and positively correlated with the consumers' adoption, though perceived usefulness was not found to affect consumers' adoption significantly. Other factors such as user's satisfaction with the Internet and perceptions of information, system and service all influenced the consumers' acceptance. In this research, Shih states that perceived usefulness and perceived ease of use determine consumers' attitudes toward online shopping, but he uses attitudes as the main factor. But attitude is a very personal and psychological term that not easy to define or measure. In the context of this study, Shih’s finding suggests that peoples attitude towards the ‘fashionability’ of online shopping may be an important factor to investigate.

Shang et al. (2005) used the Technology Acceptance Model to investigate intrinsic and extrinsic motivations of consumers' acceptance of online shopping. A survey is carried out in Taiwan between two groups of people including members of a major magazine and students from three universities, with in total 1128 samples. After the analysis of the data, model study and regressions, the researcher got the results that intrinsic motivations, for example the perceived enjoyment, are the main reason to drive consumers choose online shopping, while perceived usefulness is not an antecedent of the adoption of online shopping. Also, fashion and cognitive absorption experiences on the web are added as other important factors that explain online shopping consuming behavior. Since the data is based in Taiwan, which has a lot of things in common with China, it helps me to adjust my survey and the social influence of Fashion is also going to be discussed in my study.

Since the online shopping itself can be defined as a unique innovation, also it varies in different situation or with different products, Besides the factors that are listed by Rogers (1983) and Davis (1989), other researches either expend, add, or substitute the factors that will affect consumers’ decision of choosing to shop on-line.
Childers et al. (2001) added enjoyment as a main factor. Navigation, convenience and the substitutability of personal examination are also listed as the predictors. Eastin (2002) presents perceived convenience, financial benefits, risk, pervious use of the telephone for a similar purpose, self-efficacy, and internet use all influence the adoption process of online shopping. Liu and Wei (2003) include perceived risk as a main factor besides perceived usefulness and perceived ease of use as the main motivation of consumers’ online shopping decision. Van der Heijden et al. (2003) state that trust-antecedent 'perceived risk' and the technology-antecedent 'perceived ease-of-use' directly influenced the attitude towards purchasing online. Shang et al. (2005) present that intrinsic motivations for example the perceived enjoyment is the main reason to drive consumers choose online shopping, and also add fashion and cognitive absorption experiences on the web as other important factors.

Some factors which are presented in the Innovation Diffusion Theory or Technology Acceptance Model might turn out not to be an antecedent of online shopping, for instance Shih (2004), Shang et al. (2005) all find perceived usefulness doesn’t motivate consumers to shop online.

Fashion can be seen as a social influence when it affects people’s attitude of making a choice. And Shang et al. (2005) mention it as a symbol of a new lifestyle, and consumer’s fashion involvement can affect a person’s attitude toward online shopping thus influence the adoption of online shopping in the whole society. But in this study, the data doesn’t support the idea that fashion involvement contributes significantly to the online shopping adoption. I will adjust the concept of “fashion involvement” in my study, since the hypothesis in this paper is “users whose consumption is more easily affected by fashion trend may be more likely to shop on-line”; fashion is used as a characteristic of the consumer. I will state that consumers take online shopping itself as a fashion trend, thus shopping online is a behavior of following the fashion trend.
Enjoyment is added to the Technology Acceptance Model but demonstrated as secondary determinant while usefulness is the primary determinant. Childers et al. 2001 develops an extended Technology Acceptance Model and proposed enjoyment a significant predictor of attitude toward interactive shopping. Enjoyment contains a wide content, to follow the fashion trend can also be concluded as enjoyment or to satisfy the psychological need. In my study, fashion is a main reason that motivates consumers to choose online shopping.

Most previous research are based on data base from either a certain type of products or in a certain region: online grocery shopping by household in Netherland by Verhoef and Langerak (2001), electronic supermarket in New Zealand by Henderson and Divett (2003), online shopping in Taiwan by Shih (2004) and Shang et al. (2005), on line grocery shopping in UK by Hand, et al, (2009), etc., but not much research studies is about the diffusion of online shopping in China. And in the Chinese market, online shopping has its own characteristics. It is spreading rapid in the late five years, thus the old researches might now explain well since a lot of new features and characteristics show up lately. My study will be based on the Chinese national condition and economic situation to study the online shopping diffusion in China. Besides the standard factors listed in the Innovation Diffusion Theory, I will add ‘fashion’ as a new factor to test if it plays a significant role in motivating people to shop online.
4. A brief review of the development of Chinese Online shopping

4.1 The history of Chinese online shopping.

According to the article <Ten-year developing history of Chinese online shopping: from the great waves to go upstream against the current> (Liberation Daily, 29th Aug. 2009), the history of Chinese online shopping can be divided into 5 stages as followed:

1) 1999-2002; getting started

In 1999, the first Chinese B2C website 8848.com was established, followed by the establishment of the first C2C website Eachnet. But during that time, Internet is really a new thing to most Chinese people. From the report in <Liberation Daily> 29th, Aug. 2009, the author presents that the companies are so eager for instant success and quick profits, and this new industry is not maturely developing, in 2001, the e-commerce of China came to a downturn in the market. In 14th, Jan. 2002, 8848.com went bankrupt. And some other C2C website also closed down because of the financial problems.

During these three years, Chinese e-commerce market went through a lot of challenges.

2) 2003-2005; growing fast

In 2003, Taobao was launched. The same year, Ebay spent 180 million US dollars to acquire Eachnet, then started working in Chinese market, and became
the biggest competitor of taobao.

Taobao created its special C2C operation model, developed a new instant messaging program for a better communication between buyers and sellers, created the third-party payment Zhifubao, while ebay is still following the old marketing method. Less than a year, Taobao won the competition. Its market share jumped from 8% to 59% within two years. At the same time, this competition promoted the standardization of the e-commerce market in China.

In 2005, the Chinese online shopping market was developing rapidly driven by the rapid growth of the whole national economy with a monthly growth rate of more than 12%.

3) 2006-2007; returning to normal development

Following the good trend of e-commerce, Chinese online shopping marketing is getting mature gradually and after the rapid growth in 2005, it is returning back to the normal development. There is Merger and acquisition happening from time to time in the industry, while several big e-commerce companies: Taobao, PaiPai, Tom eachnet and Zhuoyue Amazon, start showing the utmost potential.

4) 2008-2009; growing upstream

In 2008, the financial crisis affects almost all the industries and markets around the world, but in China, the online retail industry keeps a positive growing momentum. From the <China online shopping research report 2008-2009> of I Research, It points out that the price advantage and convenience of online shopping become more prominent during the economic crisis, which motivate more consumers to choose shopping online.

5) 2010- now; stepping into a mature period
After 10 years’ development, Chinese on-line shopping is stepping into a stable developing period. Related law system has been enacted to monitor and administrate the industry. A stable market is formed after the competition between different companies <2010 Chinese e-commerce marketing statistics report> Jan. 18 2011 Chinese E-commerce research center.

4.2 Some statistics and graphs about the growth of online shopping in China.

The process of the diffusion of online shopping in China can be seen obviously from the statistics of the growing number of online consumers as well as the increase of the turnover of online shopping.

According to the Statistical Report on Internet Development in China from 2000 to 2010, in 10 years, the number of Internet users in China rose from 22.5 million to 420 million (China Internet Network Information Center, 2011) shown in graph 4.1. The growing number of netizen is the steady base for the development of online shopping market. With the wide spread of the Internet, online shopping industry is developing rapidly during these 10 years.

Graph 4.1 populations of Chinese netizens 2000-2010
The number of online buyers in China increases from thousands to billions. Especially after 2007, this number is even multiplied. See Graph 4.2. According to the Annual Research Report of Chinese E-commerce Market (Chinese E-Commerce Center, 2001-2011), in 2009, this number reaches 0.13 billion, which is one tenth of the population in China, so more than 10% people in China now are participating online shopping.

Graph 4.2 numbers of online buyers in China 2000-2010

[Bar chart showing the number of online buyers in China from 2000 to 2010.]

Not only the number of buyers is multiplied, the graph of turnover of online shopping in China (Graph 4.3) also shows the similar curve and trend according to the Annual Report of Chinese Electronic Commerce development (Department of Electronic Commerce and Informatization, Ministry of Commerce of the People's Republic of China, 2001-2011), especially after 2008.
The process of the diffusion of online shopping in China can be seen obviously from the statistics of the growing number of online consumers as well as the increase of the turnover of online shopping.

While there is a global financial crisis took place in 2008 and 2009, the economic of the whole world is facing a downturn, while Chinese online retailing still keeps it high-speed growing and is going through a period of exceptional boom, which plays an important role to drag Chinese economy still going upward (China online shopping research report 2008-2009, 2009). In other words, the financial crisis did not affect the online retailing in China negatively. Instead, it provides a potential new chance for its development.

Because of the Financial crisis, more people start choosing online shopping other than going to the shopping mall because of the price advantage of online shopping is getting more important for the consumers. On the other hand, from the seller's side, because the export suffers a shock hit, they start to hit in the local market, which also promotes the development of online retailing.
4.3 The possible reasons why online shopping is growing so fast in China

1. Price advantage:
Price is used as a key feature to compare online shopping and offline shopping. The low price of the products being sold online is one of the core competences of online shopping Druehl and Porteus (2005), Lieber and Syverson (2011). Price advantage also promotes the rapid development of online retailing in China. Selling products online can help the seller save cost like the rent of the shop, the wage of the employee. And in China, most online shop owners only need to register on the online shopping website, they don't need to pay the tax even for the profits they get. Thus in order to gain the quantity of selling to get more profits, they also set the price lower.

2. Product diversity advantage:
The diversity of the products is a main motivation for consumers to search for the things they need through Internet, especially the things that are not easily found in the real store or market in some certain regions. According to the research reports On-line shopping market in China-adventurous kingdom for foreign SME (Lee 2009) and The regional advantage of Chinese online shopping (Chinese E-commerce Research Center, 2012), the main manufactory industry is located in Southeast part of China, which means that in these regions, there is always a satisfying supply for all kinds of the articles, now because of the online shopping, consumers all around the country can check all kinds of the products they need without stepping out of their house. Besides, there is a new type of online shopping business model growing fast in China, which is to help consumers buy the products on their behalf in the market outside of China. It is increasing very fast since 2009, but mainly Luxury items or the products that is not available in Chinese market, according to the research and analyze of online
shopping of Luxury products (Taobao.com, 2011).

3. Convenience advantage:
Consumers can search the products they need on line any time and anywhere if only there is Internet connection. They don't need to worry about the opening hours of the shop; they can take their time to check the products they need and easily make a comparison of both the quality and the price. And in some subordinate cities and minor cities, there is limited variety of products, but still citizens have a strong need to consume new and fresh goods. Then choosing shopping online will satisfy their need of variety products that they cannot find in the real shops in their cities.

4. The development of logistics and delivery
The logistics and delivery is a big obstacle for the development of online shopping (Zhu and Wang, 2009). With the increasing need of delivery and the economic development, Chinese logistics achieved a very fast development though it has a late start. According to the statistics report (China Industrial Economy Institute, 2008), the number of registered express delivery company in China reaches 5000, with more than 0.23 million practitioners Liu 2011. The online shopping promotes the growing of the express delivery industry, and at the same time, the development of express delivery industry is the basic factor that drives the rapid growth of online retailing industry Liu (2011).

5. The development of online payment and other payment method
Cash against delivery used to be the main payment method of online shopping, while with e-bank started getting more sound and convenient, with the formulation and implementation of the relevant laws, with the creation of the third party payment tool to solve the security problem, the development of the online payment also becomes a key factor that promotes the development of online retail in China.
5. Hypotheses

In Roger's Innovation Diffusion Theory, the adopters are categorized into five groups according to their behavior and decisions about adopting a new invention. "Early adopters" and "early majority" are the main groups I will study, since in the Chinese situation, online shopping is more on a stable and mature developing stage as I mentioned before in part 4.1, and majority of the online consumers belong to these two groups. Before studying what factors will motivate consumers' decision of adopting online shopping, it is necessary to see if there are some characteristics of the consumers themselves will affect their decision making or not, for example their genders, ages and monthly expenses. I develop the following hypothesis to test if the basic demographic variables: gender, age and monthly expenses are correlated with people's decision of adopting online shopping.

H1: There is no relationship between students’ gender and their decision of choosing online shopping
H2: There is no relationship between students’ age and their decision of choosing online shopping
H3: There is no relationship between students’ monthly expenses and their decision of choosing online shopping

There are four main motivations that motivate consumers to choose online shopping, besides the reasons of diversity of products, cheaper price and the convenience, which have been discussed in a lot of studies before, I found that following the fashion is a unique reason, which influence people's decision more than expected, especially in China. But from the previous study of Shang et al. (2005), the hypothesis that fashion involvement contributes significantly to the online shopping adoption is rejected. I adjust the meaning of fashion here as consumers are motivated to shop online because they want to follow the fashion
trend of others doing so.

What characteristics consumers’ have are related with their fashion driven motivation is the topic I want to discuss. So I present the following hypothesis to test if the basic demographic variables: gender, age and monthly expenses are significantly correlated with people’s motivation of choosing online shopping because of fashion reason.

H4: There is no gender difference in getting motivated choosing online shopping by “fashion” reason
H5: There is no age difference in getting motivated choosing online shopping by “fashion” reason
H6: There is no difference for people with a low monthly expenses and high monthly expenses to be motivated choosing online shopping by “fashion” reason
6. Data

In China, university students and young office employees are the majority of online shopping consumers. From the perspective of Roger's Innovation Diffusion Theory, they are the Early Adopters of online shopping. And after some certain time, they also have the potential to be able to change the consumption pattern of the society. Because the university students are more willingly to fill in the questionnaire, I choose them as a sample.

600 questionnaires are carried out in two different universities "Yan'an University" and "Dongbei University of Economics and Finance" in China. These two universities locate in different parts of China and have different major structures. The students are chosen randomly to fill out the questionnaire either on line or on the paper sheet. In order to get more usable responses, I only asked 7 questions, which I assume, are most related with my study.

The questionnaire is appended to the thesis as Appendix A. It is written in Chinese for an easy understanding and convenience, and I translate it into English here.

I got 482 valid responses, thus the responsible rate is 80.3%.

Table 6.1: Gender distribution of respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>276</td>
<td>57.3%</td>
</tr>
<tr>
<td>Male</td>
<td>206</td>
<td>42.7%</td>
</tr>
<tr>
<td>Total</td>
<td>482</td>
<td></td>
</tr>
</tbody>
</table>

It shows the female respondent rate of 57.3% is higher than the male respondent of 42.7%.
Table 6.2: Age of respondents

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-19</td>
<td>57</td>
<td>11.8%</td>
</tr>
<tr>
<td>20-21</td>
<td>243</td>
<td>50.4%</td>
</tr>
<tr>
<td>22-23</td>
<td>178</td>
<td>36.9%</td>
</tr>
<tr>
<td>&gt; 24</td>
<td>4</td>
<td>0.9%</td>
</tr>
<tr>
<td>total</td>
<td>482</td>
<td></td>
</tr>
</tbody>
</table>

In China, the age of university student is mainly between 17 and 24. And 20-23 is the majority age group.

Table 6.3: Monthly expenses of respondents

<table>
<thead>
<tr>
<th>Monthly expenses</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;500 RMB</td>
<td>2</td>
<td>0.4%</td>
</tr>
<tr>
<td>500-600 RMB</td>
<td>61</td>
<td>12.7%</td>
</tr>
<tr>
<td>600-700 RMB</td>
<td>154</td>
<td>31.9%</td>
</tr>
<tr>
<td>700-800 RMB</td>
<td>136</td>
<td>28.2%</td>
</tr>
<tr>
<td>800-900 RMB</td>
<td>58</td>
<td>12.1%</td>
</tr>
<tr>
<td>900-1000 RMB</td>
<td>48</td>
<td>9.9%</td>
</tr>
<tr>
<td>&gt;1000 RMB</td>
<td>23</td>
<td>4.8%</td>
</tr>
<tr>
<td>Total</td>
<td>482</td>
<td></td>
</tr>
</tbody>
</table>

Under the Chinese situation, most university students are financially dependent on their parents, so in the questionnaire, the monthly expense is asked instead of the monthly income.
Table 6.4: The correlation table of respondents' gender (female=1), age and monthly expenses

<table>
<thead>
<tr>
<th></th>
<th>Age (sig.)</th>
<th>Monthly Exp. (sig.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-.035 (.445)</td>
<td>-.107* (.019)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>.309** (.000)</td>
</tr>
</tbody>
</table>

N=482. Legend: * Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

The correlation table 6.4 shows that gender is not significantly correlated with age but correlated with monthly expenses at the 0.05 significance level with a correlation coefficient of -0.107, which means female tends to have less monthly expenses than male. Age is found positively correlated with monthly expenses at the 0.01 significance level with a correlation coefficient of 0.309, which means that older people tend to have more monthly expenses than younger people.

Table 6.5: Online shopping experiences

<table>
<thead>
<tr>
<th>If had online shopping experiences</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>435</td>
<td>90.2%</td>
</tr>
<tr>
<td>No</td>
<td>47</td>
<td>9.8%</td>
</tr>
<tr>
<td>Total</td>
<td>482</td>
<td></td>
</tr>
</tbody>
</table>

In the 482 valid results, 435 people have had online shopping experience, which is 90.2%. Then the question is differed from those who have online shopping experiences with who don't.

Table 6.6: The main reason or the motivation of choosing online shopping:

<table>
<thead>
<tr>
<th>Motivation of online shopping</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diversity of products</td>
<td>369</td>
<td>84.8%</td>
</tr>
</tbody>
</table>
I list four main motivations in the questionnaire and most students chose more than two options. Thus the decision of shopping online is motivated by multiple factors.

Table 6.7: The main products being purchased online:

<table>
<thead>
<tr>
<th>Products</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clothes and shoes</td>
<td>329</td>
<td>75.6%</td>
</tr>
<tr>
<td>Books</td>
<td>116</td>
<td>26.7%</td>
</tr>
<tr>
<td>Electronic products</td>
<td>253</td>
<td>58.2%</td>
</tr>
<tr>
<td>Make-up products and accessories</td>
<td>172</td>
<td>39.5%</td>
</tr>
<tr>
<td>Products for hobby collection</td>
<td>27</td>
<td>5.0%</td>
</tr>
<tr>
<td>Food</td>
<td>96</td>
<td>22.1%</td>
</tr>
<tr>
<td>Total</td>
<td>435</td>
<td></td>
</tr>
</tbody>
</table>

There are 6 main products categories that I list in the questionnaire, and respondents can choose more than one option.

Table 6.8 shows that the main concerns of the 47 students who never tried online shopping are the security of payment, the security of delivery, the distrust of the products and the complication of the online shopping procedure.
Table 6.8: Reason to not adopt online shopping

<table>
<thead>
<tr>
<th>Reason</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security of payment</td>
<td>39</td>
<td>83.0%</td>
</tr>
<tr>
<td>Security of delivery</td>
<td>27</td>
<td>57.4%</td>
</tr>
<tr>
<td>Distrust of products</td>
<td>35</td>
<td>74.5%</td>
</tr>
<tr>
<td>Complication of the procedure</td>
<td>29</td>
<td>61.7%</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td></td>
</tr>
</tbody>
</table>
7. Results

7.1 Who adopts on-line shopping?

Table 7.1 reports independent samples T-test used to compare the means of online shoppers and non-online shoppers with respect to their gender, age and monthly expenses. Levene’s test of equal variances has been applied in each case. The t-statistics for gender is based on equal variance assumption; Levene’s test indicates that no such assumption should be applied to tests of the other two variables.

Table 7.1: Adoption of on-line shopping, T-test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean difference (standard deviation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>gender: student is female</td>
<td>-.187 (.076)*</td>
</tr>
<tr>
<td>age &gt; 19</td>
<td>.765 (.035)**</td>
</tr>
<tr>
<td>monthly spending ≥ 800 RMB</td>
<td>.226 (.042)**</td>
</tr>
</tbody>
</table>

Legend: * 95 % significance; ** 99 % significance

H1: Gender

Levene’s test We can see from the result that the P-value of the t test is 0.014, which is less than 0.05, thus the null hypothesis is rejected, and so we can conclude that there is a sufficient evidence to show the gender is related with people’s decision of choosing online shopping. The data thus show that female students are more likely to adopt online shopping than male students.

H2: Age

In order to make it easier to test, I categorized the students who are younger than 19 (including 19) into the young group, and the students who are older than
20 into old group.

The P-value of the t test is 0.000, which is less than 0.05, thus the null hypothesis is rejected, and we get the conclusion that people of different age have different decisions of choosing online shopping. In particular, people who are older than 20 are more likely to adopt online shopping.

H3: Monthly Expenses

In order to make it easier to test, I categorized the students whose monthly expenses are below 800 RMB into the less spending group and whose are more than 800RMB into another group.

The P-value of the t test is 0.000, which is less than 0.05, thus the null hypothesis is rejected, and we can conclude that there is a significant difference for people with different monthly expenses to make decisions of choosing online shopping. People who have more monthly expenses are more likely to choose online shopping.

7.2 Who is motivated by fashion to adopt on-line shopping?

Table 7.2 reports independent samples T-tests used to determine if there is any relation between gender, age, and monthly expenses with people’s motivation of adopting online shopping due to fashion reason. Levene’s test of equal variances has been applied in each case. The t-statistics for age is based on equal variance assumption; Levene’s test indicates that no such assumption should be applied to the tests of the other two variables.

Table 7.2: Motivated by fashion, T-test
<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean difference (standard deviation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>gender: student is female</td>
<td>.223 (.044)**</td>
</tr>
<tr>
<td>age &gt; 19</td>
<td>-.009 (.030)</td>
</tr>
<tr>
<td>monthly spending ≥ 800 RMB</td>
<td>-.234 (.037)**</td>
</tr>
</tbody>
</table>

Legend: * 95 % significance; ** 99 % significance

H4: Gender and motivated by fashion reason (female=1)

The T-test result shows that the p-value is less than 0.05, thus there is a significant relationship between people’s gender and their motivation of choosing online shopping because of fashion reason. Females are more likely to be motivated by fashion reason to choose shop online.

H5: Age and motivated by fashion reason

The test result shows that the p-value is more than 0.05, thus the hypothesis is accepted, which means there is no significant relationship between people’s age and their motivation of choosing online shopping because of the fashion reason.

H6: monthly expenses and motived by fashion reason

The test result shows that the p-value is less than 0.05, thus the hypothesis is rejected, which means there is a significant relationship between people’s monthly expenses and their motivation of choosing online shopping because of the fashion reason. People with less monthly expenses are more likely to be motivated by fashion reason to adopt online shopping.

7.3 Test with the Logit Regression Model

The logistic (Logit) model is adopted to estimate the influence of demographic variables: Female (gender, where female=1), age and monthly expenses on
people's decision of adopting online shopping:

\[ P(y=1) = \frac{\exp(\beta_0 + \beta_1 x_{1i} + \ldots + \beta_n x_{ni})}{1 + \exp(\beta_0 + \beta_1 x_{1i} + \ldots + \beta_n x_{ni})} \]

Where \( y=1 \) if the consumer has adopted online shopping, if not, \( y=0 \). \( x_{ij} \) is the value of the demographic variables of the consumer \( i \).

See the Regression result in Table 7.3

Table 7.3: Adoption of on-line shopping, Logit regression

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>female</td>
<td>1,936</td>
<td>,545</td>
<td>12,618</td>
<td>1</td>
<td>,000</td>
<td>6,934</td>
</tr>
<tr>
<td>age</td>
<td>1,869</td>
<td>,267</td>
<td>49,157</td>
<td>1</td>
<td>,000</td>
<td>6,483</td>
</tr>
<tr>
<td>monthlyexp</td>
<td>1,301</td>
<td>,304</td>
<td>18,290</td>
<td>1</td>
<td>,000</td>
<td>3,672</td>
</tr>
<tr>
<td>Constant</td>
<td>-40,096</td>
<td>5,671</td>
<td>49,988</td>
<td>1</td>
<td>,000</td>
<td>,000</td>
</tr>
</tbody>
</table>

The result shows that gender, age and monthly expenses all influence consumers' decision of adopting online shopping, while gender has the highest coefficient value, which means gender has a strong effect in online shopping adoption. While age and monthly expenses all contribute positively to people's decision of adopting online shopping.

For gender, the odds ratio (Exp(B)) for female is 6.934, which shows that females are more likely to adopt online shopping than male by a factor 6.934. The odds ratio (Exp(B)) for age is 6.483, suggesting that people are older than 20 (including 20) is more likely to adopt online shopping than who are younger than 19 (including 19) by a factor 6.483. For monthly expenses, the results show that the odds ratio (Exp(B)) is 3.672, which means people have more monthly expenses have higher probability of adopting online shopping than those with less monthly expenses.

The correlation table 6.4 shows that gender and monthly expenses, age and monthly expenses are correlated that male and people that are older than 20
tend to have more monthly expenses. Thus female and monthly expenses both are the factors that motivate online shopping adoption.

Table 7.4 shows logit estimates on the influence of demographic variables: female (gender, where female=1), age and monthly expenses on people’s fashion driven motivation of adopting online shopping

\[
P(y=1) = \frac{\exp(\beta_0 + \beta_1 x_{1i} + \ldots + \beta_n x_{ni})}{1 + \exp(\beta_0 + \beta_1 x_{1i} + \ldots + \beta_n x_{ni})}
\]

Where \(y=1\) if the consumer choose fashion as a motivation to adopt online shopping, if not, \(y=0\). \(x_{ij}\) is the value of the demographic variables of the consumer \(i\).

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>female</td>
<td>.907</td>
<td>.202</td>
<td>20,099</td>
<td>1</td>
<td>.000</td>
<td>2.477</td>
</tr>
<tr>
<td>age</td>
<td>.109</td>
<td>.073</td>
<td>2,216</td>
<td>1</td>
<td>.137</td>
<td>1.115</td>
</tr>
<tr>
<td>monthlyexp</td>
<td>-.308</td>
<td>.082</td>
<td>14,177</td>
<td>1</td>
<td>.000</td>
<td>.735</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.123</td>
<td>1.481</td>
<td>2,055</td>
<td>1</td>
<td>.152</td>
<td>.120</td>
</tr>
</tbody>
</table>

The result shows that female (gender, where female=1) influences consumers’ motivation of adopting online shopping by fashion reason positively, and monthly expenses contributes negatively to people adopt online shopping due to fashion reason. Gender has the highest coefficient value suggesting a stronger effect on fashion driven reason than monthly expenses. And age is not found significantly influence consumers' fashion motivation of adopting online shopping.

For female, the odds ratio (Exp(B)) is 2.477, which shows that females have higher probability of adopting online shopping by fashion reason than males by 2.477. The odds ratio (Exp(B)) for monthly expenses is 0.735, suggesting that people have less month expenses are more likely to be motivated by fashion reason to adopt online shopping than those who have more monthly expenses.
8. Discussion

8.1 Conclusion

In this paper, I mainly study the online shopping as a new innovation and its diffusion in China. From the results of the tests, it is easy to see that online shopping adoption is strongly related with demographic factors, for instance people's gender, age and monthly expenses. And in Roger's Innovation Diffusion Theory, these demographic factors play an important role in deciding which group the adopters belong to. Thus, the online shopping diffusion in China fits Roger's theory. But in China, the influence of the detailed demographic factors might be different from the other countries. For instance, from my test results, female, people who are older than 20, with more monthly expenses are more likely to adopt online shopping. But in other cases, male might be more likely than female to be motivated to choose online shopping (Chen & Wellman, 2004; Laukkanen & Pasanen, 2008).

The motivations that drive people to adopt online shopping in my study are mainly: cheaper price, diversity of the products, convenience and in order to keep up with the current fashion. The first three reasons can be explained by Roger's Innovation Diffusion Theory. Rogers presented relative advantage as one of the factors that influence people's decision, and cheaper price, diversity of the products and convenience can all be discussed as relative advantage. And convenience can be explained both as perceived usefulness and perceived ease of use, which are the major factors that are listed in David's Technology Acceptance Model.

But neither Innovation Diffusion Theory nor Technology Acceptance Model can explain consumer's adoption behavior that is motivated by fashion reason. Thus it needs to be added as a new factor, which is similar to the factor that Childers et al. 2001 present as enjoyment (see also Shih (2004), who uses the concept of
‘attitudes’ in a related manner). Though in the study of Shang et al. 2005, the test results show fashion is not significantly related with people's motivation of choosing online shopping, when they assume people whose consumption is more fashion involved are more likely to shop online. From the data of my study, there are 42.3% people are motived to adopt online shopping because they consider the behavior of online shopping itself as a fashion and they want to follow this fashion trend. Fashion has not been studied as a main factor that influences people's adoption of online shopping in the previous studies of other countries, and this rate of 42.3% shows that it is a unique feature of Chinese online shopping.

The test results of hypothesis H4, H5, H6 show that not all the demographic variables are related with people's motivation of fashion reason: Female and people with less monthly expenses are more "fashion driven" to adopt online shopping, while the age is not found to be significantly related with people's motivation of choosing online shopping because of the fashion reason.

This study finds that the main reasons why people refuse to adopt online shopping are: concern of the security of payment (83%), distrust of the products (74.5%), complication of the procedure (61.7%), concern of the security of delivery (57.4%). Among these reasons, complication of the procedure can be explained as the complexity factor that Roger mentioned, or perceived ease of use from Technology Acceptance Model. In the situation of purchasing products online, there is a risk in paying the bill before receiving the products, besides, it takes time and also is risky to get the products delivered instead of having them immediately, and not being able to see the real products that the consumer wants to purchase are the main disadvantages of online shopping. Liu and Wei (2003), Van der Heijden et al. (2003) all mentioned perceived risk as a factor that influences people's adoption of online shopping, and these reasons can be explained by perceived risk factor.
8.2 Limitations of the study.

1. Biased sample might be used in the data of the study. Since the data is collected in questionnaire from students of two universities in China, the 600-sample size is not large enough to get the reliable results confidently. Though the university students are the majorities of online shopping consumers in China, they cannot represent the whole consumer group.

2. The limitation of the Test and regression that are used in the study. Since T test is only available for testing the difference between 2 groups, thus age and monthly expenses are categorized into 2 groups, which might influence the significance of the test. Because the variables female and monthly expenses, age and monthly expenses are correlated, thus there is some doubt in the accuracy of the estimation.

3. There might be other factors that influence the fashion motivation in adopting online shopping which are not involved in the study, for instance the region of the consumer, the major of the students or the job type of the employees, and the education background, etc.
Appendix A

Question about online shopping

1. Gender:

2. Age:

3. Your Monthly Expenses:
   a. <500RMB
   b. 500-600RMB
   c. 600-700RMB
   d. 700-800RMB
   e. 800-900RMB
   f. 900-1000RMB
   g. >1000RMB

4. Have you ever tried online shopping?

5. If yes, what is your main reason or motivation to shop online instead of going to a traditional store?
   a. For the diversity of products (have more choices or can buy products which is not available in the normal store)
   b. For the cheaper price
   c. For the convenience (no need to go to shops and can compare different products and prices easily)
   d. To follow the fashion (since online shopping is becoming a new fashion among young people)
6. What products you mainly purchase online?

   a. Clothes and Shoes
   b. Books
   c. Electronic products
   d. Make-up products and accessories
   e. Products for hobby collection
   f. Food

7. If you haven't tried online shopping, what is your main concern of not trying?

   a. Security of payment
   b. Security of delivery
   c. Distrust of the products
   d. The whole procedure is too complicated
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