

## DETERMINANT FOR ADOPTING AN INNOVATION : SMALL AND MEDIUM-SIZE RETAILERS IN A DOUGHNUT PHENOMENON

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**Abstract** We paid our attention to non-compatibility with finance theory, as a result of surveying diffusion of innovation theory and investigating the feature. We analyze how the perceived risk of an innovation had affected decision-making of innovation adoption by small and medium-sized enterprise with the case of regional small retailer to the innovation which the retailer adopted. The retailer had overestimated the risk of the innovation to minus. Furthermore, they were indifferent to almost all risks. When they adopted an innovation, their decision-making was performed in the risk of a familiar small number, without carrying out suitable evaluation.

**Keywords** determinant, innovation, risk, SME

### 1 Introduction

According to Diffusion of Innovation Theory (DOI-Theory), the size of socioeconomic or the size of organization have a decisive role in adopting of an innovation. According to the existing literatures, it is a difficult for SMEs to become the early adopter (early majority) of an innovation. In other words, a small socioeconomic and organization, like a SME, is generally reluctant to adopt an innovation and thus cannot fully enjoy economic benefit if any.

On the other side, financial theory suggests SMEs should pursue a business opportunity of high risk-return profile reflecting higher cost of capital relative to large companies. If early adoption of an innovation corresponds to higher risk-return opportunity, SMEs need to adopt an innovation at an early stage for survive. Here is the dilemma for SMEs in terms of an innovation adoption decision. If SME will intend to be economically efficient, they thus have to press forward strongly adopting of an innovation, contrary to the prediction of DOI-Theory.

The Small and Medium Enterprise Agency researched what had done business managers emphasize for adopting or implementing of an innovation. The SMEs' managers for adopting or implementing of an innovation had answer that they regarded leaderships, such as manager's spirit of challenge, originality and creativity, and agile decision-making as requisite factors for the purpose. These are remarkable utterances, we think. The SMEs' managers for adopting or implementing of an innovation had recognized that the success of adopting or implementing of an innovation depends largely on their individual capability.

This paper focuses on the dilemma when SMEs adopt an innovation. First, we review existing studies investigating the relationship between the adopting of an innovation and the decision-making behind. Then, we analyze an example in Japan. The example is an innovation which the SMEs adopted. These SMEs are few retailers located on local shopping streets. They adopted the innovation in order to reactivate the shopping street against doughnuts phenomenon. However, it has not become success yet. How did they make a mistake during determination process? What is mistake?

The main subject of this paper exhibits the fact which is one of the causes of generating dilemma in SMEs. SMEs have estimated the downside risk excessively in adopting of an innovation; besides, SMEs capture merely few risk factors at examining of an innovation adoption. They don't care about the risks which are not directly relates to the innovation they consider, such as the environment risks and the market risks. SMEs, in other words, do not have a viewpoint of synthetic financial efficiency (the returns on investing) at the decision-making.

## **2 The definition of an innovation**

Rogers which discussed DOI-Theory said, "an innovation is an idea, practice, or object that is perceived as new by an individual or other unit adoption (Roger 2002: 12)." It is asked whether or not 'new' is "objectively" new for the person or unit which is going to adopt an innovation. Zaltman et al. (1973: 158) discussed about the innovation of the organization, defined innovation as "any idea, practice, or material artifact perceived to be new by the relevant unit of adoption." An innovation may be a large concept which points out a series of processes until it recognizes, adopts and carries out an innovation and accounts for the conclusion (Slappendel 1996). In its broadest conceptualization, the innovation process typically embraces periods of design and development, adoption, implementation, and diffusion. Cooper said that innovations are plural concepts, while discussing the problem of decision-making about an innovation. "Innovation is a multidimensional concept that can involve product or process, technological or administrative and incremental or radical changes. (Cooper, 1998)"

In this paper, we consider an innovation in broad sense and do not care the newness for society as a whole following the above citations. And an innovation process is also regarded as an innovation because we discuss the factors having impact on determination of adopting or implementing for an innovation in SMEs.

## **3 Decision-making of SMEs in innovation research**

The difference in managerial capabilities between SMEs and large firms will put in appearance at the difference in making-decision without surprise. How is precedence research of the innovation caught about decision-making of such SMEs? DOI-theory of Rogers et al. (1962; 1983; 2002) clarified the diffusion process of innovation at the viewpoint of supplier. Rogers said, about relationship between the rate of adoption and the time element, "the adoption of an innovation usually follows a normal,

bell-shaped curve when plotted over time on a frequency basis.” And he succeeds “the rate of adoption for an innovation can be represented by either a bell-shaped (frequency) curve or an S-shaped (cumulative) curve” (Rogers 2002). It is said that the rate of adoption for an innovation can express as an approximate value of a normal distribution.

And Roger classified the adoption person of an innovation into five categories according to the adoption time of an innovation, (1) an innovative adoption person (innovator), (2) an early adopter, (3) an early majority, (4) a late majority, and (5) an adoption delay person (laggard), then he noted the characteristics of these adopter categorization. The characteristics lay out three viewpoints, socioeconomic status, personality value, and communication behavior. Roger and diffusion researchers found 25 variables within three viewpoints. They explained the difference of characteristic in each category through the variables. Roger and diffusion researchers beside, investigated the relationship between an organization and the adopted innovation by the organization. And they reported that the relationship between the size of an organization and the rate of adoption is even equal to a normal, bell-shaped curve when plotted over time on a frequency basis, and reported that a strong correlation exists between the size of an organization and the adoption time (Mahler and Rogers 1999). On the other hand, Zaltman et al noted that relationship among organizational structures, such as characteristics of the organizational leader, the structural feature of internal tissue, and appearance characteristics of an organization and innovation have comparatively low correlativity (Zaltman et al. 1973).

The DOI-Theory relates the characteristic of adopter to adopting of an innovation, but this theory does not investigate determinant of adopting for an innovation. In this theory, adopting of an innovation is the most important focus so that many issues in the implementation process of an innovation and the consequence of an innovation are not objects of argument for. Though, DOI-theory has an important perspective of relative advantage about the determinant of an adopter's decision-making.

Rogers described “the relative advantage is to be one of the strongest predictors of an innovation’s rate of adoption”, and “relative advantage is a ratio of the expected benefits and the costs of adoption of an innovation.” The relative advantages include “economical profitability, low initial costs, a decrease in discomfort, social prestige, a saving of time and effort, and immediacy of reward.”, and is positively related to its rate of adoption. Roger also said about the consequence of the diffusion of innovation as “the consequences of the diffusion of innovation usually widen the socioeconomic gap between the earlier and later adopting categories in a system.” The earlier the adoption of an innovation, the richer the acceptor become.

The relative advantage can be translated in to risk-return framework in the way that early adopters seek high risk-return opportunity while late majority seek low-risk, low- return, we thought. The difference in the rate of adoption for an innovation is even equal to a difference in the risk of adoption for an innovation.

In the early stages of the diffusion of innovation, the consequence of adopting of an innovation is uncertain and the adoption requires taking high risk. When innovation turns to be successful, the high risk will bring high return to early adopter. The risk of adopting for an innovation decreases with over time as the gradual accumulation of the information about adopting of an innovation and its consequences.

According to financial market's suggestion, SMEs need to become an early majority as SMEs' cost of capital is high. SMEs need to buck for high-risk, high-return after all. But as we described before, SMEs have the dilemma. In all probability they do not hope high-risk. As the risk of adopting for an innovation make an impact to SMEs' making-decision, a lot of SMEs might not become the early majority or innovator.

It may be worth to review the behavior of high risk-return SMEs such as bio ventures as an exceptional SME class from the risk aversion perspective. They sometimes realize explosive economic effectuation which exceeds a major company. This fact does not fit together DOI-Theory which suggested correlation about the relationship between a size of firm and the rate of adoption for an innovation.

Acs and Audretsch which carried out empirical study of the Schumpeter hypothesis noted, "The evidence presented here implies that both sides of the debate-those arguments supporting the innovative superiority of large firms and those supporting the superiority of small firms are, in fact, correct." Then, he reported about industry with innovative advantage for the major company, "Industries which are capital-intensive, concentrated, and advertising intensive tend to promote the innovative advantage in large firms." They also reported about industry with innovative advantage for the SMEs, "the small-firm innovative advantage, however, tends to occur in industries in the early stages of the life-cycle, where total innovation and the use of skilled labor play a large role, and where large firms comprise a high share of the market. (Acs and Audretsch 1987) "

Research of Acs and Audretsch is on the extension of the empirical study of the Schumpeter hypothesis of the 1960s (research of Hamberg, Mansfield, and Mueller, etc.). These antecedent researches were proved that Schumpeter's hypothesis is not realized in a certain type of industry. So, SMEs such as bio-venture are one of exception in DOI-Theory. Such suggestions give important implications for SMEs which tries to adopt of an innovation. The suggestion of Acs and Audretsch may be of service for judgment whether the innovation which SMEs want is innovative advantage or not. In the succeeding section, the example of the innovation which the local shopping streets adopted is taken up. Local retailers are in the vortex of the problem of city urban sprawl. They are adopting an innovation and tried to oppose the problem. What kind of positioning does the innovation which they tried to adopt become in DOI-Theory? How does DOI-Theory evaluate this innovation again? We will discuss the relationship between their decision-making and the evaluation in DOI-Theory.

## **4 A Regional Retailers' Innovation**

### **4.1 The outline**

We take up the innovation which the shopping street in the local city in Japan has chosen. There is a problem of a doughnut phenomenon of a city zone in the local city in Japan. The Japanese government carried out policy called "Town Management Organization (TMO)" in order to cope with this problem. TMO provided support for redevelopment of the city central. TMO is a system for bringing up the talented people who work on their own initiative in order to carry out urban redevelopment. The shopping streets employed this system and discussed redevelopment of the city central part with TMO forum many times during consensus formation among participants. As a result, they adopted the innovation called a tenant mix. A tenant mix is the technique of trying to redevelop a city efficiently by combining the institutions that were in the area, such as commercial establishment, a public facility, and living accommodations. The developer combines the institution usually considered to be the more nearly optimal at the area and the place.

It was expected that this technique was a method that some of problems which exist in the central city area of a local city can be coped with. If this innovation is adopted, the retailers who managed roadside shops will make a trade of their own land for one corner of the compound building, and they will become one of the tenants of a shopping mall in the building. In the exchange of offering the land owned in this urban development area, the owner-manager of the retail stores, by adopting this innovation, will own one corner of the compounded type institution building built, and will in aggregate form a new shopping mall. And in this innovation, they received public funding to construct the building. Administrative operation of the building was managed by a independent organization so that their responsibility is a very little.

### **4.2 Current picture of shopping street in Japan**

Before examining this case, we should explain an outline of shopping street in Japan. Doughnut Phenomenon of a city zone caused losing population from the central part of a local city. Being losing population from the active city central part, the social economical system has been changing in local area. The analysis of two notable researches examining the issues initiated by governmental bodies in will be summarized as follows.

4.2.1 The research advisory conference report about the state of the city planning for central city area reproduction (Ministry of Land, Infrastructure and Transport 2004)

The residential populations, the number of places of business, and the number of workers in the central part are decreasing. The central city area has lost the function as the place in which people live, and a place to commit first.

The commercial functional has fallen in the city center area. This is a problem pointed out for some

time. The decrease of the population of the central part gives rise to the doughnut phenomenon in a commercial function. As a result, the shopping streets have called the street of closed the shutters.

The government enacted the city-planning-three-law, Central City Invigoration Law, City Planning Law, and Large-Scale Retail Store Location Law in order to prevent a decline of a central city area in 1997.

However, this report of Ministry of Land, Infrastructure and Transport documented the ineffectiveness in the city-planning-three-law function. The city-planning-three-law was revised in 2006. The concepts of the compact city were pushed out by the front (Hosono 2008), and make a person, an institution, etc. which were diffused to the city circumference part by motorization get back to city central area.

#### 4.2.2 Shopping street survey 2006

This survey which the Small and Medium Enterprise Agency, the Ministry of Economy, Trade and Industry, conducted in 2006 investigated by making 8000 into a sample among the shopping streets 13322 in Japan. The purpose of survey researches what kind of measures and policies required by the present condition of a shopping street. This shopping streets survey has been implemented since 1970 every five years, it is carried out since 2000 every three years.

Survey contents are various that cannot introduce here. We introduce only results of survey which is considered to be important. Did the number of going at shopping streets change?

48.5% of the respondents answered the number of population visiting established shopping streets decrease, 22.5% answered the decreased a little, while merely 8.9% answered the increase.

What is factor in visitor's reduction?

55.7% of the respondents answered visitor's reduction influences of a large store, 45% answered reduction of an attractive store, 39.3% answered shortage of a type of industry and business condition, 26.5% answered a decrease in population of the area.

How is the business of shopping streets?

32.7% of the respondents answered business performance that it is on the decline, 37.6% answered Although stagnated, a possibility of declining has, 22.9% answered it has stagnated, while merely 4.8% answered although stagnated, there are upward signs. 98.4% of the whole answered are on the decline or has stagnate. In the same survey in 2003, the respondent who answered "Are on the decline or has stagnated" was 97.7%. As long as the result of this questionnaire is seen, the many shopping streets already have a decline or regular stagnation.

What are the big problems in shopping streets? (by the multiple-answers)

36.9% of respondents answered there are few attractive stores, 33.4% answered it is not cooperative to session to shopping street activity, 31.4% answered problem is manager's aging, etc..

#### 4.3 Previous shopping street studies

The research concentrated on Doughnut Phenomenon of a city zone in the shopping streets has a large

majority. We introduce several researches which suggested coping with Doughnut Phenomenon of a city zone. Ishihara noted that the balance of the internal-view and the external-view look is important, because If the external-view dilutes, the city planning as a commercial accumulation place will be blocked (Ishihara 2005). Sakamaki represent that a tenant mix builds the structure of co-existence and co-prosperity, when a large-scale store and a small-scale store carry out a tenant mix. The customer retention power of the whole commercial accumulation will be raised by filling the gap between a large-scale store and a small-scale store, each other (Sakamaki 2008).

Hosono suggested for succeeding city planning, "(1) the shopping street should establish of a brand in local area. (2) The shopping street should appeal diplomatically by selection and concentration. (3) The shopping street should do your best for making the organization of activation, and talented-people practical use. (4) ICT (Information and Communication Technology) should be used effectively and the information potential in a sphere of business should be raised. (Hosono 2008)"

The trend of the latest research seems to advocate the revolution to the city central part based on compact city concept. It has been a subject how suburbanization produced by the spread of cars is made to return to the city central part.

#### **4.4 RURSUS HOFU Project**

##### 4.4.1 Background

Hofu is a city with a population of 120,000 located in the westernmost end in Honshu Island. It is fronting the Setonaikai sea on the central part of Yamaguchi Prefecture, and is an industrial city consisting mainly of the auto industry and its related company. Five small-scale shopping streets has stand in loosely-linked network on the city central part. There are two SC(s) with the large-scale parking place in the neighborhood. The customer retention power of shopping streets is declining. The shopping street which adopted the innovation in this example took part in the redevelopment project of a city area since around 1992. When the government made Central City Invigoration Law in 1998, the redevelopment project was reconstructed to the type of reflecting policy of new low intention, and "the Hofu town-center-revitalization master plan" was formulated in 1999. The basic concept for the innovation is shown in this master plan. The TMO forum investigated the feasibility of the master plan, and their plan was approved as a subsidiary enterprise by the government in 2004. In same year, they began construction of a multipurpose building. The building named RURSUS-HOFU was completed in 2006, business was started within second.

##### 4.4.2 The outline of innovation

The core of this innovation lie in the construction of a multipurpose building which unified commercial establishment, a public facility, and living accommodations, then established a LLC for managing the building and planning the shopping center under unified decision-making. The basic concept of the

management was a tenant mix which pulled up the customer retention power of shopping center, and rise commercial accumulation. The main adopters of this innovation were the retailers of a shopping center. They were also the landowners of a shopping center. The supplier of this innovation was Japan's government. The TMO forum was a change agent. The TMO forum members were a person in charge of a HOFU city office, a person in charge of a chamber of commerce and industry in HOFU, three retailers in the shopping streets, and consultant.

#### 4.4.3 Relative location attachment of innovation

Being recognized as New for a shopping center is following three. Tenant mix: The multipurpose building which unified commercial establishment, a public facility, and living accommodations will accumulate economy, and will raise customer retention power. New commerce is served in the combination of cross-industrial or a same trade kind, or a network. Maintenance and strengthening of a shopping-center organization: Establish a limited liability company and perform tenant collection, institution employment, and shopping center employment under the unified concept. Reservation of the source of fixed income by a landowner's commercial-establishment sharing: Own the commercial space which is a landowner and the owner of a commercial store can lend in a complex facility. By lending a tenant the space, the house rent income which can expect the stable income can be obtained.

#### 4.4.4 Positioning on the social system of an innovation

On a social system, a tenant mix is not novel enough to count as an innovation. A tenant mix is a technique used by SC large-scale from the first. It is applied based on the concept which SC unified, and a tenant is selected by the concept (Kikuchi & Benitani, 2006). Eguchi and Sinnaa validated the evidence about the business effect of the redevelopment compound building of a local city (Eguchi 2001, Sinnaa 2006). Kikuchi et al. validated and reported about the tenant mix enterprise of two preceding examples which received the public support (Kikuchi & Benitani 2006). With the TMO concept by Central City Invigoration Law in 1998, the tenant mix technique based on instruction of a TMO forum is also recommended as one of the activation techniques. A lot of local public agencies formulated the town-center-revitalization master plan since 1998. Probably, the tenant mix adopted in many master plan.

#### 4.4.5 The map to DOI-Theory

Positioning on the social system of an innovation corresponds to that of the rate of adoption in DOI-Theory. We will try to map this innovation to DOI-Theory. The rate of adoption is equal to the amount of the risk of an innovation. And the amount of a risk is equal to the amount of information about adopting of innovation and its consequence. The tenant mix technique has been variously used by a department store and SC, and seen in many precedence examples of urban redevelopment. Probably,



the information about adoption and its consequence of a tenant mix is fully accumulated; the information will be easy to receive. As there is enough information in the world, this innovation is positioned by Late Majority in DOI-Theory.

#### 4.5.6 The risk of adopting an innovation

We described the relevance of DOI-Theory and risk return in the foregoing paragraph. Then, we consider a risk of existing on the innovation of an example and the outskirts of it.

The risk of relating to a tenant mix: A tenant selection, matching, zoning, tenant subscription and withdrawal, expansion reduction of business, CS, pulling in more customers

The risk of relating to maintenance and strengthening of a shopping-center organization: Leadership, communication, subscription withdrawal, the fund that can be managed

The risk of reservation of the source of fixed income by a landowner's commercial-establishment sharing: A sense of entitlement of tenant subscription and withdrawal, a house rent setup, and a floor holder, a neighboring tenant building

The potential risk of indirectly related to an innovation: The event of economic conditions, politics, the neighborhood SC, and a town, suburban large store advance and withdrawal, the weather, the enterprise that each retailer has peculiar, etc.

We considered an innovation called a tenant mix to position by Late Majority in DOI-Theory before clause. If the consideration is right, the risk of relating to a tenant mix should become quite low. The tenant mix is low risk innovation. Naturally, the adopting of this innovation would not produce high profit. SMEs need to choose high-risk, high-return management strategy. In other words, SMEs do not need to adopt this innovation. Then, for what reason did the retailer of the shopping center adopt this innovation?

#### 4.5.7 The interview about the adopting of an innovation

We interviewed the retailer of the shopping center which adopted the innovation.

The object of an interview is retailers who is not a member of TMO forum, where opened a shop in a multipurpose building. . The purposes of an interview is to find determinant of decision-making which adopts this innovation, and open a shop in this building. Furthermore, we try to find what risks they have recognized in adopting for an innovation.

We got to know some new facts out of the interview. The forecast on management, number of pulling in customer, sales, and resident of tenant was lain out to adopter form change agent. Each shown forecast was based on the very optimistic linear model. There was few explanation of a risk of adopting an innovation from a change agent.

The adopter felt intuitive anxiety to optimistic forecast which the change agent presented. As a result, they depressed their will to refuses opening a shop at once. They had a judgment that they did

not want to take new risks, number of pulling in customer risk, sales risk, and resident of tenant risk in addition to their peculiar business risk. However, their mind is changed by a change agent's persuasion.

## 5 Conclusion

We paid our attention to non-compatibility with finance theory, as a result of surveying DOI theory and investigating the feature. SMEs' behavior which DOI theory shows differed from that for which finance theory is asking. We investigated the innovation which the shopping center of the local city adopted in order to confirm the non-compatibility. And we have noticed that there is almost no concept of a risk in making-decision judgment of SMEs from the interview to them. We consider that the relation between decision-making and a risk would like to conduct more detailed investigation in near future.

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