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TABLE OF CONTENTS

Special Essay:

Royalty Free Intellectual Property and Inter-industrialization of MNEs

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1. Introduction

Alliances created between companies operating in different industries have been starting to appear. One of the causes of such alliances is the IoT, the “Internet of Things”.

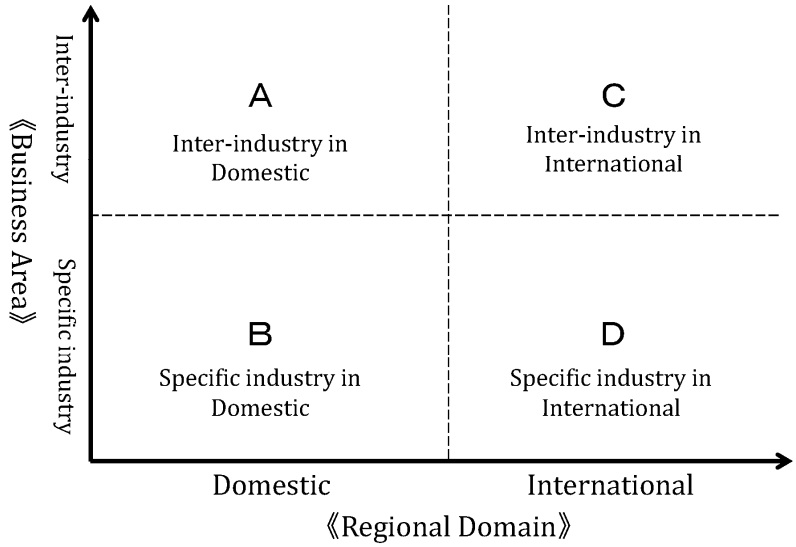
Since various things around us are connected to the Internet via the IoT, things which people previously managed separately can now be managed in one system. In other words, the premise of the IoT is cooperation beyond the boundaries of discrete industries. As a result of this, as technology which utilizes IoT develops and increases in popularity, the demand by the users for technology that can make uses of various industries will also increase accordingly. One of the most important things for creating such an alliance is a technology standard. Indeed, the IT Strategic Headquarters of Japan Cabinet Secretariat has decided to promote the IoT policy, emphasizing that the key for IoT policy success is such a technology standard.

My interest in this matter is how the technology standards move and develop under these situations. The purpose of this essay is to consider the strategy of technology standards of MNEs in society in the future.

2. Research Target

In the recent IoT business situations, a classification such the one shown in figure 1 is possible. In this figure, the regional domain where a standardized technology is utilized is shown on the horizontal axis. It shows that the standardized technology is used in either a specific country or in an international business environment. For example, when the technology utilized in "B" is also utilized in "D", "international standardization of technology" will be pushed forward and that strategy is also necessary.

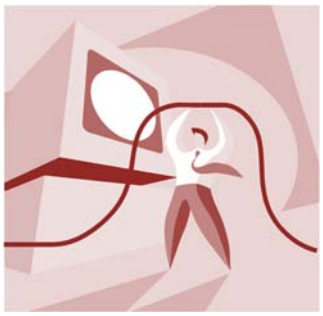
Figure 1: Classification of Business Area



" Since the technology utilized in the IoT business is developed under such a situation, the technology should be able to be cope with both international business and inter-industrial business when MNEs want to set the standard."

On the other hand, the business area where a standardized technology is utilized is shown on the vertical axis. It shows that the standardized technology is used in either a specific industry or in an inter-industrial business environment. When the technology utilized in "B" is also utilized in another industry, it is necessary to make an “inter-industrial standardization of technology”.

This essay focuses on “C”, which has the characteristics of both international business and inter-industrial business. There is also a premise which suggests the need for two types of cross border from the beginning of its technological development. Since the technology utilized in the IoT business is developed under such a situation, the technology should be able to be cope with both international business and inter-industrial business when MNEs want to set the standard. However, the research of the technology development strategy in such a premise is difficult to find in already completed research.



Previous research papers concerned with the technology standards show economic effects such as network externalities, a bandwagon effect, the lock-in effect and the switching cost.

As for the de facto standard in a specific technology, there are many studies of the competitive advantages that paid close attention to the differentiation created by entry barriers and cost reduction possible due to economies of scale. These are based on the studies of "B" and "D" on the above figure. Though there are the studies on strategic behavior of the MNEs based on a specific piece of technology or the appropriability of the intellectual property (IP), the premise of these studies is the transfer process from “B” to “D”. In addition, there is a study of consensus standards which has an important meaning when the inter-industrial alliances are formed in specific countries. But this study is based on either “A” or “B”.

3. Synchronization between Internationalization and Inter-industrialization of IP

Of course, we can see technology which has been utilized both in foreign countries or other industries. The technology which is transferred from industry standard (B) to international standard (D), and to inter-industry standard (C) is already verified. However the previous research with regard to technology standard has overlooked the synchronization of internationalization and inter-industrialization.

There is a need to know that such synchronization is not the same as the technology strategy examined in the existing MNEs' competitive strategy theory. IP was the source of earnings as a proprietary license in the process of the international standardization of technology. License fees, which increase with the spread of the technology, had a substantial impact. Besides, in order to pursue the further spread of the technology, expanding the usability of such technology was also very significant. Figure 1 suggests that the pattern which was aimed at "C" after "D" was intentional. We can understand the standard strategy concerned with CDs or DVDs in such a context.

However, facing both the inter-industrialization as well as internationalization is the premise at the beginning of the development process of technology. Therefore, technology with specific usages is not inter-industrialized. In the IoT business, it is important for various kinds of users which belong to different industries to use the technology. But it is extremely difficult to develop the technology which corresponds to various uses in only a specific MNE. So, it is generalized today that the standardization of IoT technology is formed in consortium, to be constructed within a company across either a border of countries and/or industries.

In order to spread standardized technology, influential companies which have many customers need to join the standardization process as members of such a consortium. That is to say, the consortium which is able to make a licensee company the leading member is necessary when MNEs want to develop the standardization in the "C". What many consortiums propel is the royalty free (RF) nature of the core technology at that time.

" In order to spread standardized technology, influential companies which have many customers need to join the standardization process as members of such a consortium. "

4. Royalty Free Status of Intellectual Property

Recently, intellectual property rights (IPR) policy has comes to be opened through consortiums. It is established in this way to avoid conflicts over rights or license fees. The license was charged in consortium in general. In those cases, it was named RAND (reasonable and non-discrimination), or FRAND (fare, reasonable and non-discrimination). But many consortiums adopt a RF stance in regards to IoT business. (See table 1)

This table shows that the majority of consortiums choose RF. There is an increase in this tendency in particular after 2008, and about 70% of consortiums adopt RF. What is the incentive of companies to promote RF? The answer can be found in the possibility of creating a

Table 1 IPR policy survey in IoT consortia

	Consortium	Full Name	Foundation	No. of Members	RF	RAND
1	TMForum	TMForum	1988	850	close	
2	OMG	Object Management Group	1989	264	◎	
3	ITS America	The Intelligent Transportation Society of America	1991	370	close	
4	OASIS	Organization for the Advancement of Structured Information Standa	1993	279	◎	
5	BBF	Broadband Forum	1994	153		◎
6	IMTC	International Multimedia Telecommunication Consortium	1994	30	◎	
7	LONMARK	LonMark International	1994	118		◎
8	W3C	World Wide Web Consortium	1994	398	◎	
9	FSAN	Full Service Access Network	1995	73	close	
10	TOG	The Open Group	1996	521	○	○
11	ECHONET	ECHONET Consortium	1997	266	○	○
12	OIF	Optical Internetworking Forum	1998	99	○	○
13	Bluetooth.SIG	Bluetooth.SIG	1998	8000	◎	
14	GCF	Global Certification Forum	1999	284	close	
15	FCIA	Fibre Channel Industry Association	1999	24	close	
16	ITS Forum	ITS Info-communications Forum	1999	94	close	
17	OSGi	OSGi Alliance	1999	144	◎	
18	HPA	HomePlug Alliance	2000	39	close	
19	SIP Forum	SIP Forum	2000	29	◎	
20	MEF	Metro Ethernet Forum	2001	206	◎	
21	IIC(ITS)	Internet ITS Consortium	2002	86	close	
22	OMA	Open Mobile Alliance	2002	70	◎	
23	ZigBee	ZigBee Alliance	2002	408		◎
24	DLNA	Digital Living Network Alliance	2003	175	close	
25	EPC Global	EPC Global（GS1）	2003	1500	◎	
26	MoCA	Multimedia over Coax Alliance	2004	45		◎
27	NFC Forum	Near Field Communication Forum	2004	167	○	○
28	Ethernet Alliance	Ethernet Alliance	2005	87	◎	
29	Continua Health Alliand	Continua Health Alliance	2006	closed	close	
30	NGMN	NGMN Alliance	2006	96		◎
31	OGF	Open Grid Forum	2006	19	○	○
32	Hadoop	Apache Hadoop Project	2008	57	◎	
33	HbbTV	HbbTV Association	2008	82	◎	
34	HomeGrid Forum	HomeGrid Forum	2008	58	◎	
35	IPTVFJ	IPTV Forum Japan	2008	109	◎	
36	Kantara	Kantara Initiative	2009	45	◎	
37	SGIP	Smart Grid Interoperability Panel	2009	144	◎	
38	JSCA	Japan Smart Community Alliance	2010	272	close	
39	OpenADR	OpenADR Alliance	2010	127		◎
40	JSSEC	Japan Samrtphone Security Association	2011	145	close	
41	OCP	Open Compute Project	2011	97	◎	
42	ONF	Open Networking Foundation	2011	141	◎	
43	OPEN Alliance SIG	OPEN Alliance special Interest Group	2011	311	close	
44	Wi-SUN	Wi-SUN Alliance	2012	91		◎
45	FIDO	Fast Identity Online alliance	2012	262	◎	
46	OCC	Open Cloud Connect	2013	18	close	
47	AllSeen	AllSeen Alliance	2013	169	◎	
48	OpenDaylight	OpenDaylight Project	2013	50	◎	
49	IIC	Industrial Internet Consortium	2014	238	◎	
50	THREAD	THREAD GROUP	2014	216	◎	
51	OPNFV	Open Platform for NFV	2014	58	◎	
52	AOM	Alliaance for Open Media	2015	16	◎	
53	UHD	UHD Alliance	2015	42	close	
54	OpenFog	Open Fog Consortium	2015	32	◎	
55	MulteFire	MulteFire Alliance	2015	17	close	
56	LoRa	LoRa Alliance	2015	246	◎	
57	WIoTF	Wireless IoT Forum	2015	6	close	
58	Hyperledger	Hyperledger Project	2016	81	◎	
59	OCF	Open Conncectivity Fouccation	2016	179	◎	
60	TIP	Telecom Infra Project	2016	40	◎	
61	DMTF	Distributed Management Task Force	dissolution	162	○	○

Notes: "◎" demonstrates a clear choice of either RF or RAND, and "○"means choice of both.
Source: Forum report of Telecommunication Technology Committee

◎ 31 ◎ 7
○ 6 ○ 6

huge market by making an IoT standard. One particularly appropriate example case in this regard is Qualcomm.

5. The Case of Qualcomm

Qualcomm was established in San Diego, California in 1985. The development of the technology for the mobile phone communication systems was entrusted by the FCC (Federal Communications Commission), and Qualcomm suggested a CDMA system in the late 1980s. Though this conception eventually failed, Qualcomm continued developing the CDMA for cell-phone systems on the ground.

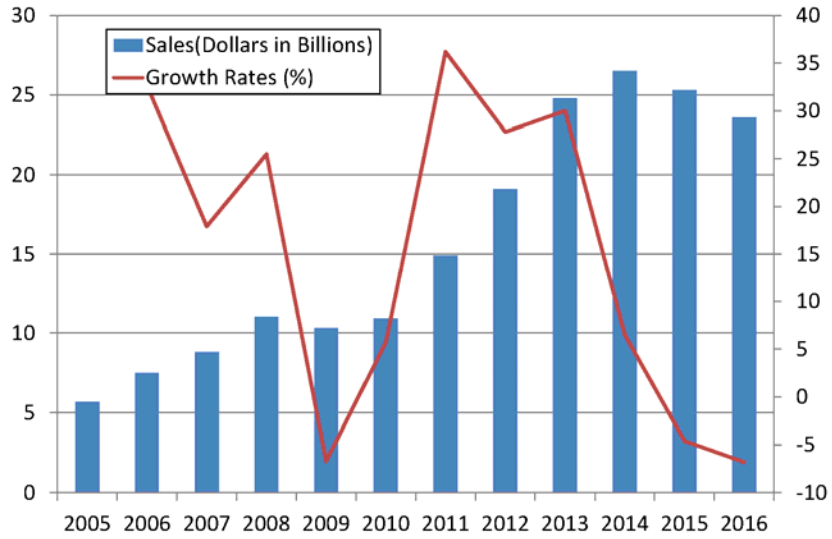
In the communication standard called "the 3rd generation" (3G), both the W-CDMA system and CDMA2000 system would have coexisted, but the standards of the W-CDMA was almost unified at one time. Qualcomm maintained an essential patent for two kinds of standards at that time.

However, they insisted on the coexistence of each of the two standards since it was CDMA2000 to be compatible with the standard "cdmaOne" of the 2G, which Qualcomm led. Since the standard of "cdmaOne" was compatible with CDMA2000, Qualcomm announced that they would never license the essential patents of the W-CDMA if two standards had not coexisted.

The main product of Qualcomm is "snapdragon", and it is bundled with almost all of the recently developed cell-phones. The royalty from the cell-phone manufacturers is a great source of profit for Qualcomm. In January 2017, Apple brought a suit against Qualcomm claiming that their royalty fees were too expensive, which went on to become international news and spark a global debate.

In this way, Qualcomm had continued their business model of maximizing profit based on their IP. However the performance of Qualcomm has been decreasing in recent years. In regards to their growth rate, the situation worsens after 2011. (See figure 2)

Figure 2: Performance of Qualcomm



Source: Qualcomm annual report

Despite this, they have started another business model in the IoT business field. In the new business model, they are making a core technology RF. It is a piece of software called "AllJoyn", created and developed in-house. AllJoyn is a framework that was developed to make the environment of IoT more convenient. The latest version of AllJoyn was developed in December 2016.

The connected devices which are accessible to the network will increase in future, so people will be able to benefit from home appliances through the IoT situation they have in place at home. Conversely, however, the widespread increase of IoT devices creates not only benefits but also may become a source of confusion. In a given home, if the rice cooker, refrigerator, air-conditioner, air cleaner, and hot water supply device all change to their IoT device equivalents, each device may need to be used by different means of communication, OS and application software. It may become necessary for users to choose the relevant application on their smartphone, the PC software or the operation panel fitted to the wall and so on for every new device they install in their home. It is difficult for users themselves to develop connection settings for each IoT device.

For this reason, Qualcomm has developed an IoT framework named AllJoyn to connect each IoT device together. In AllJoyn, the function that users are able to apply in various IoT devices is prepared in a library. Since users can get AllJoyn at no charge, connecting various IoT devices together has also become much easier.

" It is constructed in connection with various countries and companies from different industries. This means that it is a consortium which promotes both international standards and inter-industrial standards at the same time."

As aforementioned, the core technology of AllJoyn was developed by Qualcomm. Qualcomm developed the standardization in a consortium called Allseen Alliance, distributing this technology for free. Over 150 MNEs, such as Canon, Electrolux, Haier, LG Electronics, Microsoft, Panasonic and Sony participate in this consortium. It is constructed in connection with various countries and companies from different industries. This means that it is a consortium which promotes both international standards and inter-industrial standards at the same time.

AllJoyn has three characteristics. The first is that it is able to connect without a cloud in the proximity communication; the second is that each IoT device is connected mutually and each displays its own functions; the third is that all things are connected regardless of which company they were created by. Since general IoT devices depend on a specific cloud or OS, AllJoyn's method of connecting various devices is certainly innovative.

In addition, AllJoyn is comprised of three layers. The basic layer finds the IoT device, realizes that it has a function which can be utilized by AllJoyn and is connected. It can also provide functions such as access control or coding as an API. The second layer is the basic library as mentioned above. The top layer is called the application layer, which defines the user interface.

Various pieces of installation apparatus are utilized in consumer houses throughout the world. At present, it is not easy to connect them. Not only can AllJoyn connect apparatus easily, but also provide various additional services.

Products such as TV and an air cleaner made specifically for AllJoyn, and wireless speakers made by Panasonic have already come up abroad. All

editions of Windows 10 supported AllJoyn, too. The possibility of spread widely adoption in future is unmistakable.

Qualcomm has also developed "DragonBoard 410c" as a tool to develop IoT devices use AllJoyn. This is a board equipped with 410 Qualcomm Snapdragon processors. The users can easily make environments for AllJoyn by using DragonBoard 410c. In addition, Qualcomm begins to bundle SnapDragon, which has been included in a smartphone until now, with various devices for AllJoyn.

SnapDragon is a device which carries a fee. Therefore the sales of SnapDragon directly affect the profits of Qualcomm. In other words, as Qualcomm makes AllJoyn RF, software for use in the IoT environment will become more common, and the international standard and inter-industrial standard in the consortium "Allseen Alliance"-made business model should lead to increased profits for Qualcomm itself.

" The IP free model brings new opportunities for business in the IoT world. From these, the biggest challenge for MNEs is to understand how to manage "inter-industrialization of international business" in the society of the future."

6. Conclusion

The case of Qualcomm shows us that "RF of IP" has an important meaning at its center. At the same time, one of the most important things is that cooperative MNEs which are gathered from different countries or industries develop the standardization of free IP in consortiums.

This phenomenon has not been mentioned in the conventional international business study thus far. The IP free model brings new opportunities for business in the IoT world. From these, the biggest challenge for MNEs is to understand how to manage "inter-industrialization of international business" in the society of the future.

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Special Essay:
The Ultimate Source of Competitive Advantages of the Firm

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1. Introduction

Digital innovation and economic globalization requires firms to be flexible, highly innovative, and responsive to customers quickly on a global scale. Because few possess resources and capabilities to be all these things, and a system of products and services are connecting to be "a part of system of systems", firms are increasingly looking for allies to formulate the competitive business-ecosystem over their rivals.

" The strategic alliances can literally be seen a form of 'alliance' with a content that is 'strategic'."

In response to the real world, studies of strategic alliances, business-ecosystem, platform business and open innovation have been one of the major areas of strategic management research (e.g., Badaracco, 1991; Contractor & Lorange, 2002; Eisenmann *et al*, 2011; Gawer & Cusmano, 2002; Doz & Hamel, 1998; Chesbrough, 2006). In this essay, I would like to take up the source of competitive advantages for discussion and try to approach the strategic nature of alliances.

There are as many definitions of strategic alliances as there are scholars on this theme. This variety of definitions seems to be caused by different research methods, where each scholar conducts an inductive analysis, elaborately scrutinizing the empirical studies on alliances, pulling out specific features from them, and then synthesize these features into their consistent conceptual framework (e.g., Child & Faulkner, 1998; Doz & Hamel, 1998; Reuer, 2004). By contrast, this essay tries to give a definition of strategic alliances formulated in a different way. The strategic alliances can literally be seen a form of 'alliance' with a content that is 'strategic'. Thus, for gaining the better understandings of the strategic nature of these alliances, it is indispensable to grasp the substance of the strategic management theory, and then locate alliances within its framework. By this method alone we are able to theoretically clarify 'strategic alliances' as a technical term in a strategic management field.

For this purpose, we critically deal with a resource-based view for discussion as one of the major schools of strategic management. We attempt to distill the ultimate sources of competitive advantages of the firm by amending RBV from an entrepreneurial viewpoint, and then give a definition of strategic alliances.

2. Internal Resources & Capabilities of a Firm

Since the mid 1980s, the RBV has emerged as one of the substantial schools of strategic management (Barney, 1986a, 1986b; Rumelt, 1984;

Wernerfelt, 1984). The increased attention to firms' resources by researchers has seemed to be beneficial to understand the potential contributions of resources to competitive advantage. The RBV suggests that the resources possessed by a firm are the primary determinants of its performance, and these may contribute to a sustainable competitive advantage of the firm (e.g., Hoffer & Schendel, 1978; Wenerfelt, 1984). According to Barney (1991) the concept of resources includes all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness (Daft, 1983).

Amit & Schoemaker (1993) define resources as stocks of available factors that are owned or controlled by the firm, which are converted into final products or services. Capabilities, in contrast, refer to a firm's capacity to deploy resources, usually in combination, using organizational processes, to produce a desired effect. Hence, the presence of capability enables resources to be utilized, and the potential for the creation of output arises. While resources are the source of a firm's capabilities, capabilities are the main source of its competitive advantage (Grant, 1991).

The result of this is that the concept of 'capability' is the capacity of a firm to convert resources they possess into the 'service'. The relationship can be formulated as

$$S = f(C, R)$$

for some general function f (.) so that C and R are the parameters of S, where C is capacity of capability, R is resources, and S is service.

3. To See the RBV from another Angle

When we made a brief survey of the conceptual framework of the RBV (Barney,1986a, 1991, 2001), it may be paraphrased as follows:
Under the two assumptions, i.e. (1) firms within an industry may be heterogeneous with respect to the strategic resource they control, and (2) these resources may not be perfectly mobile across firms, and thus heterogeneity can be long lasting, RBV asserts that the resource must have four attributes:
(a) it must be valuable,
(b) it must be rare,
(c) it must be imperfectly imitable (or costly to imitate), and
(d) non-substitutable (costly to substitute).
The conditions (a) and (b) produce the competitive advantage and (c) and (d) relate to its sustainability.

No matter what attributes the RBV researchers point out regarding resources, most of all advantages which originated from resources ought to be compensated for their owner. And the source of competitive advantage of the firm remains only by their monopoly rent. It follows from what has been said, that the RBV does not fulfill the

conditions for acquiring a competitive advantage. Only firms that already possess a competitive advantage are qualified to adopt the RBV. Thus, how can we recognize the academic value in the RBV in terms of explaining the source of the competitive advantage of a firm? By examining Barney's (1986a, 2001) research, we find that he might recognize the existence of the source of competitive advantage besides resources *per se*. The 'strategic factor market imperfection' is the key concept for finding the academic value in it.

The economic performance of the firms depends not only on the returns from their strategies but also on the cost of buying the resources from these markets to implement those strategies. Barney(1986a) shows there is an implied possibility that the competitive advantage may come from the imperfections in strategic factor markets. Different firms in these markets will have different expectations about the future value of a strategy that creates this imperfection, and the owners of the firm also have different expectations about the future return of their resources. Therefore, different expectations toward the resources produce the possibility of a competitive advantage for a firm.

" Firms that intend to obtain a competitive advantage must be consistently better informed concerning the future value of these resources than other firms."

Figure.1 Entrepreneurial Arbitration

		Firm (entrepreneur) A		
Other firms (entrepreneurs)		overestimate	Accurate	underestimate
	overestimate	Equilibrium (excess competition)	Others buy the resource → disadvantage	Others buy the resource → disadvantage
	accurate	A buy the resource → disadvantage	Equilibrium (competitive)	Others buy the resource → gain CA
	underestimate	A buy the resource → disadvantage	A buy the resource → gain CA	Equilibrium (no competition)

If a firm (Firm A or entrepreneur) overestimates a strategy's return potential from the resource that is acquired in the market, the firm A will probably sustain an economic loss in the long run. As a result, the firm A gains the competitive disadvantage vis-à-vis the competitor of the firm (other firms or entrepreneur) gain the competitive advantage. In the same context, if a firm A underestimates a strategy's return potential from the resource that is acquired in the market, the competitor of the firm gains the competitive advantage, if they estimate the value of the resources higher than the firm and acquire them at the price less than the actual value of it (see Figure.1). We name the source of competitive advantage as 'entrepreneurial arbitration'.

This kind of competitive advantage, named 'economic rents' by Barney, reflect the creative and entrepreneurial ability of firms to discover how to generate value with their resources in ways that other firms and outside owners cannot anticipate (Barney, 1986a, 2001). Firms that intend to obtain a competitive advantage must be consistently better informed concerning the future value of these resources than other firms. His expression 'managerial foresight' or the 'accurate expectations of return

potential of the strategy' is the entrepreneurial function (adjusting the value differentiation in the factor market). Therefore, we share a part of the idea with Barneys' work in terms that the firm could gain the competitive advantage by exploiting the disequilibrium in the factor markets.

4. Entrepreneur as a Resource

In case firms obtain a competitive advantage, resource heterogeneity does not necessarily require by itself. The heterogeneous perceptions are more important than the heterogeneous resources per se (Lewin, 2005; Lewin & Phelan, 2002).

As an aside, even if it is logical to represent the function of entrepreneurship in the RBV, how can we recognize the relationship between the RBV and entrepreneurship? For recognizing this relationship, Casson (2004) helpfully points out that resource-based theory highlights the importance of human resources, as reflected in competencies and capabilities, to the performance of the firm. The theory of entrepreneurship simply asserts that the abilities of the entrepreneur are the principal human resource possessed by the firm. Other resources, such as the capabilities of scientists and managers, derive from those of the entrepreneur, since it is the entrepreneur who has selected the people with these capabilities to work for the firm.

The firm is not only the unit to cooperate and coordinate resources, but also the one to specialize decision-making by entrepreneur. Not all decisions are strategic and some decisions are matter of a routine, but routine procedures must be designed, and this is often a strategic decision. Under some circumstances, the direction of resources and capabilities are not chosen without the abilities of an entrepreneur. Those are empowered by the entrepreneur's abilities. The abilities of the entrepreneur here is a super-ordinate concept to capability. Hence, the presence of the ability enables capability to be performed along the entrepreneur's vision or strategy, capability enables resources to begin to be utilized, and the potential for the creation of service arises. The main source of the competitive advantage is the abilities of the entrepreneur. We can formulate the relationship as

" The firm is not only the unit to cooperate and coordinate resources, but also the one to specialize decision-making by entrepreneur."

$$S = f(E, C, R)$$

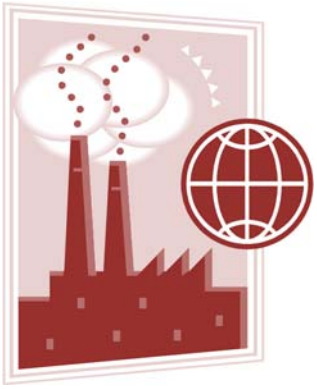
for some general function f (.) so that E, C, and R are the parameters of S, where E is the quality of entrepreneur's decision making, C is capacity of capability, R is resources, and S is service.

Let us assume that the S express the 'vector' of service under the condition that R and C are expressing just some 'scale' of resources and capabilities, the abilities of entrepreneur (i.e., E) is a vector of the same dimension of S (i.e., both vector could be the same because entrepreneur should know about the market opportunity, thus the service vector, and knows the possible services that his firm could produce with their resources and capability), we could formulate the relationship as follow:

$$S = E' f(R, C),$$

where the apostrophe (') represents the transpose operation on the E vector, and this time the function f(.) generates the possible services that the firm could produce.

Then the 'possible' S that the firm probably provide is expressed matrix, given the R and C, and entrepreneur chooses the 'focus', or 'direction' of the actual services provided (e.g., E=(0,1,0,0) would be a very strong suggestion from the entrepreneur for the firm to focus on service 2, and not on services 1, 3 or 4 at all. Perhaps we should restrict the vector E to have |E|=1; length 1) this is because E affects the types of service that the firm provides (i.e. the direction of the vector S). The resources and capability of the firm control the level of services. Considering the case of 2 resources and 2 capabilities, producing 3 S {(p) (q) and (r)}, the matrix may be the following diagonal one:



$$\begin{pmatrix} S_p & 0 & 0 \\ 0 & S_q & 0 \\ 0 & 0 & S_r \end{pmatrix}$$

S_p is the maximum amount of services (p), that the firm can provide, S_q is that of (q), and S_r is that of (r). When entrepreneur chooses a 'focus', for example he may choose (2/3, 2/3, 1/3), this will result in next combination of services:
$S = (2/3\ S_p\ 2/3\ S_q\ 1/3\ S_r)$. It would be expected that Sp, Sq and Sr all depend on the two resources and two capabilities in different ways.

Assume here S_p and S_q use resource 1 and capability 1, and S_r uses resource 2 and capability 2. This time the diagonal matrix won't be appropriate since entrepreneur have to divide the first resource between Sp and in Sq. Therefore, perhaps this matrix would be more appropriate for this example:

$$\begin{pmatrix} S_p & -t_{pq} & 0 \\ -t_{pq} & S_q & 0 \\ 0 & 0 & S_r \end{pmatrix}$$

where t_{pq} express the 'trade-off' between services (p) and (q), perhaps because they cannot produce maximal amounts of S_p and S_q at the same time. We would imagine the relationship as

$$t_{pq} = 1/2\ kS_p + 1/2\ mS_q\ /2 \quad (k+m=1)$$

for some fractions k, m between 0 and 1. Each k and m depends on the resources and capabilities.

Let's assume that k=m=1/2, now if the entrepreneur chooses E= (2/3, 2/3, 1/3), he will now get

$$S = (2/3\ S_p - 2/3\ t_{pq}) + (-2/3\ t_{pq}\ \ 2/3\ S_q) + 1/3\ S_r$$
$$= (1/3\ S_p\ 1/3\ S_q\ 1/3\ S_r).$$

Assume that k=1 m=0, he will get (0, 2/3, 1/3).
Assume that k=1/4 m=3/4, he will get (1/2, 1/6, 1/3).

It means the entrepreneur have to develop or buy resources that could compensate for the shortness of S_p, S_q . We suppose that k and m related to the idea that the resources aren't limitless; e.g., if you run a factory, and want to produce two completely different products, perhaps it takes time to switch the production between the two products, therefore you could either make 1000 of product (A), or 1000 of product (B), but only 400 of each if you should change half-way through, because it takes time and resources to change the production line.

5. Sources of Competitive Advantage

While both invoking and amending the RBV from the entrepreneurial point of view, if we consider the creation of competitive advantages, then the objective of strategic management is defined as follow: Strategy is the function of a firm to obtain an entrepreneurial rent by exploiting the factor markets disequilibrium (i.e., to maximize the difference between the *ex ante* values of inputs and the *ex post* values of outputs in a dynamic world) through firm-specific capabilities and resources which are directed by the abilities of an entrepreneur (originating from the heterogeneous perception of the entrepreneur).

" This suggests that the function does not confine a firm to have entrepreneur, but some group in a firm can fulfill its function as an entrepreneur."

Someone may claim that the introduction and immediate selection of the entrepreneur as an explanatory mechanism besides resources and capabilities does not come as a natural step. It seems that such an alternative explanation as 'group decision-making culture' is not discussed here. As we examine some of eminent Japanese firm's decision-making process, which is characterized by a kind of group-decision making, it seems to me that the claim is well justifiable. In fact, for example, there is collective selection mechanism in Toyota: new routine (e.g., multi-task job assignment along the process flow, task assignment for volume changes and productivity improvement, on-the-spot inspection by direct workers, assembly line stop cord and so on) could not be adopted without the consent from the shop floor supervisors to the factory managers, and they even have a right, to some extent, to do screening them. This suggests that the function does not confine a firm to have entrepreneur, but some group in a firm can fulfill its function as an entrepreneur. Therefore, I treat the entrepreneur as an entity, which takes a function of entrepreneur, whichever it is an sole entrepreneur or not.

6. Strategic Nature of Alliances

At last we are ready to consider how to locate alliances within the revised framework. In the discussion up to this point, it has become clear that the one of the most important sources of competitive advantages is to exploit factor markets disequilibrium, which are brought about by unique entrepreneurial perception. To treat the advantages as such, we must keep in mind that the category of resources that the entrepreneur must take into consideration may not be limited only to the resources a firm possesses. The resources outside the firm also fall under this category.

As the evidence from the real world suggests, for instance, most innovation is carried out not only by new combinations of resources inside the firm, but also combinations ranging from inside to outside the firm with alliances. In this connection, we must also revise our view of capabilities, not to confine their function to cooperate and coordinates resources inside a firm, but to extend its application to those of outside the firm for accelerate the open innovation through alliances. In the RBV the emphasis is on how to sustain rare resources over the long term, and these resources and capabilities are accumulated inside the firm, it is unable to explain the process whereby firms combine resources outside the firm. The RBV regards a firm as if it is an autonomous entity, and the competitive advantages of the firm are generated by the combination of the heterogeneous resources inside the firm, thus there is no room for any advantages stemming from the alliances.

Of course, we understand that some scholar says it is a misunderstanding to think that the RBV does not acknowledge the value of (relations with) outsiders to the firm. A careful re-reading of Barney (1991) will reveal he also implied social relations and social capital, like alliances, in his definition of resources. However, what we really wanted to say is the RBV is relatively make little of the role of the network (embedded) around the firm as the source of competitive advantage.

Alliances of the firm would be open up alternative ways for a better usage of resources. Alliances could bring the opportunities for the firm to modify the value of underestimated and/or overestimated resources they possessed, because the real value of any resources would be realized only after the combination of them with other resources, which are not confined inside the firm. The uniqueness, the heterogeneity of any resources, and the sources of competitive advantages come from the different combination of them, and the combination would be organized by the different perception of the entrepreneur. With these points in mind we can state that alliances are strategic when they are directed by the entrepreneur to adjust differentiation of resources' value through a unique combination of resources which distributed among the 'hierarchies'.

" We can state that alliances are strategic when they are directed by the entrepreneur to adjust differentiation of resources' value through a unique combination of resources which distributed among the 'hierarchies'."

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