To what extent is the Japanese government able to steer the nation's economy in the digital age?

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Abstract

The Japanese government-led post-war economic miracle is a well studied topic; consequently, Japan's approach to government-led economic development is one that many countries have tried to replicate. As the digital age questions some fundamentals of economic growth, it is critical to understand whether government-led industry development still works. This research addresses the question: to what extent is the Japanese government able to steer the nation's economy in the digital age?

Theoretically, the thesis makes use of an approach influenced by Benson's (1975) Inter-organizational Network (ION) approach, resource dependency approaches (Pfeffer & Salancik 1978) and the sensemaking perspective (Weick 1995). The data was collected during three years fieldwork in Japan, combining documentary analysis with interviews with leading industry and government figures. Through making sense of interview-based data, a qualitative case study of the mobile telecommunications industry was constructed. I constructed scenarios that provided differing plausible views of government involvement. These scenarios focused on the role of government in influencing key resources necessary to the Japan mobile telecommunications industry, control of which might enable firms to achieve the attainment of an optimum market position. The purpose of these scenarios was to highlight different accounts of various key resources. The key resources that emerged through the data analysis are *amakudari*, technology standard and radio frequency spectrum.

Various hypotheses have been advanced to account for the relation between government involvement and the development of the Japanese economy, ranging from the view of Porter, Takeuchi and Sakakibara (2000) that government intervention is a sign of market failure to the views of Johnson (1982) that government involvement is essential to Japanese economic development, with the more modulated views of Tsuru (1993) falling between these two extremes. However, these hypotheses do not address the dynamics of government involvement and industrial

development, i.e. ION relationship, resource dependency and level of competition, that form the unique contribution that is the extension and innovation of this thesis. Further, the globalization and digitalization in the 21st century creates a need to take a fresh look at government's role in industrial development. The case study of the 3G digital economy provides an obvious and highly current testing ground for evaluating these different hypotheses. The findings show that the direction of the nation's 3G mobile industry was derived through communication and negotiated sensemaking between the Japanese government and industry stakeholders. The implication is that a healthy circuit of sensemaking between government and industry stakeholders could enhance industrial development.

Key words: government involvement, resources, inter-organizational network, competition, industry development, *amakudari*, technology standard, radio frequency spectrum, narratives, sensemaking, scenarios, mobile telecommunications

Chapter One – Introduction

Japan's mobile telecommunications industry is amongst the most advanced in the world. I began my thesis work with a series of questions about its emergence and success that were only loosely formulated; as the thesis developed these questions began to solidify into the following broad questions: What role have pure market forces played in this success? Is the success attributable to some aspects of Japanese culture? Are the practices that have driven this successful development a replication of the post-war economic miracle? To what extent did the Japanese government play a role in the success of 3G mobile? If yes, what did they do? How did other industry stakeholders respond to the government's involvement[1]?

In posing and trying to answer these questions, I was clearly influenced by a diverse body of literature related to Japanese economic development. There are various theories and hypotheses about how the Japanese government is involved in industry development; for instance, Johnson (1982), Porter, Takeuchi & Sakakibara (2000) and Tsuru (1993). Moreover, I had already read and been influenced by what I consider to be a deeply thought-out framework for addressing government and interorganizational relations: this was the political economy of organizations framework of Kenneth Benson (1975). I noted that the existing theoretical accounts of Japanese economic development did not explain the interorganizational network (ION) relationship among the firms involved and between the firms and the government, the central concern of the ION framework. The ION among the firms involved is the domain in

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1 Special thanks and acknowledgement to Mr. Tetsuo Kurisawa, who shared with me in 2002 that, in Japan, government involvementism is a more appropriate description than government interventionism.

which resource dependence and competition exist. Rather than focus on either firms or industry policy one has to look at their interaction in the ION.

The basic research question that I was exploring began to crystallize: to what extent is the Japanese government able to steer the nation's economy in the digital age? The research that I conducted to answer this question is based on data collected during fieldwork in Japan and through interviews with leading industry and government figures. Through making sense of an interview-based qualitative case study of the mobile telecommunications industry, scenarios were created to provide a plausible view of government involvement enacted through influencing key resources necessary to firms in Japan's mobile telecommunications industry and their attainment of an optimum market position. The key resources that emerged through the data analysis are *amakudari*, technology standard and radio frequency spectrum.

The findings show that the direction of development the nation's 3G mobile industry was derived through communication and negotiated sensemaking between the Japanese government and industry stakeholders. By applying the ION framework, as well as the resource dependency and sensemaking perspectives, this research created a new theoretical perspective for looking at government involvement in industry development. So that government and business people can benefit from this research I have sought to write an easily explicable narrative account of how the Japanese government and mobile telecommunications stakeholders communicate and negotiate sensemaking. The findings of this research promote the idea that a healthy circuit of sensemaking between government and industry stakeholders will enhance industrial development.

Chapter Two – Background

1. Introduction

This chapter outlines the current situation in the field of Japanese political economic and industrial development, as well as addresses the development of theories that attempt to explain the forces driving Japan's post-war economic development. It addresses briefly: industrial context; government; industrial policy; industrial development and performance; Japan's post-war economic development, and the domain and analytical framework of this research. Through this consideration of the context of Japan's economic growth in the post-war era, my research question is to what extent is the Japanese government able to steer the nation's economy in the digital age? The research focus is on the industrial development of the mobile telecommunications industry in Japan.

The general context of national policy and legislation, as well as specific industrial policy, influence industrial development through shaping the capacity of individual organizations to reap intended or desirable collective outcome. Thus, it is important to understand how the dynamics of government policy which actually act on organizations and/or structure the industries within which the organizations exist. The study of the influence of national policy on industry has been the subject of significant attention in research in organizational studies, as this key environmental influence can have wide-ranging social, economic and political ramifications for industry and be the basis of success or failure of organizations in the affected industry. For example, notable studies have been made of how government policy had an impact on the bureaucratization of US industry (Baron, Dobbin & Jennings 1986), how policy affects competition and entrepreneurial behavior (Dobbin & Dowd 1997), and relationship between government intervention and competitiveness of focal industries in Japan (Porter, Takeuchi & Sakakibara 2000)

As the Japanese economic bubble burst in the early 1990s, it seemed that the credibility of the Japanese government, in terms of its industrial development, had vanished (Gao 2001; Porter, Takeuchi & Sakakibara 2000). It appeared that the nexus between the Japanese government's intervention in industry, and economic success, had gone past its use-by date, and that the recent strategies of the Japanese government had not adapted, evolved or been re-invented to cope with accelerating changes in market and technology developments. The Japanese government did not seem to have the capability to react and respond adequately to the paradigm shifts in the macro economic and international competitive environment, and the changing and higher expectations of industry. Also, Japanese management did not respond adequately to emerging shorter-term views of technology and economic returns, changing shareholders expectations and the dynamics of faster business cycles that did not allow for the long-term adaptation and quality perfection of processes and procedures that had been the hallmark of Japan's competitiveness in the past. The ability of the Japanese government to adapt and/or compensate for these changes, based on their long-standing industrial framework(s) and vertical (*keiretsu*) organizational models, seemed to observers, such as Porter, Takeuchi & Sakakibara (2000), to have been lost.

Evident empirical questions concerning the relation between government and firms, which addressed these changing dynamics in a contemporary industrial arena, were clearly in need of answering; thus, this research takes the emergence of the digital age and the mobile telecommunications sector, in particular, as a natural laboratory to study the extent to which the Japanese government is capable of steering industrial development in the 21st century, a digital age.

2. Government

Government is one of the most important institutions with which all organizations have to interact. Government, as a body holding geographical jurisdiction, has the authority to enact legislation, which

bounds the activities of all organizations within its state sphere. Government can exert its influence on industry or the economy in at least two broad ways. First, government can exercise influence in the macro-economic environment through monetary policy, e.g. interest rates and money supply, and through fiscal policy, i.e. government budgeting. Second, it can formulate and implement interventions into the micro-economic environment, through influencing such aspects of an organization's activities and viability as the supply and demand for credit, through variable interest rate policies; profits may be subject to more or less income tax; the competitive environment may impose entry barriers, such as esoteric standards and/or import duties; the government may institute preferred supply arrangements to local companies, use export grants and industry assistance, as well as create foreign investment and ownership restrictions. Thus, the government is able to create and/or manipulate the environment within which organizations exist, and shape the ambient conditions for organizations to grow in a controlled and protected environment. Of course, historically, comparatively, and politically, different governments will possess and use these capabilities differentially.

3. Industrial Policy

Government industrial policy is the 'application of government resources and influence to industrial affairs' (Magaziner & Hout 1980, p. 1). Johnson defined industrial policy as 'a summary term for the activities of governments that are intended to develop or retrench various industries in a national economy to maintain global competitiveness...[and]...it is first of all an attitude, and only then a matter of technique' (Johnson 1982, p. 7). Industrial policy not only mirrors a nation's priority in industrial development, but also reflects how a government intends to exert its influence upon these industries. Thus, industrial policy is industry specific policy aiming at influencing the industry as a whole towards the government's intended or desirable outcome. Different governments might

have industrial policy with different characteristics: for example, the US tends to be broadly non-interventionist, while the Peoples Republic of China tends to be more interventionist. Nevertheless, such characteristics of individual governments might change from time to time and from issue to issue: the US government has been very interventionist of late in protecting areas such as the domestic steel industry or ensuring that vital ports infrastructure does not enter into Middle Eastern ownership; China liberalized its Internet restrictions somewhat for journalists during the Beijing 2008 Olympic Games.

In general, government does not have an isolated industrial policy for a specific industry; rather it orchestrates the relevant environment of an industrial field to facilitate the implementation of that industrial policy. Such a relevant industrial field includes related industries. No single industry is an island; all industries exist in economic systems in which industries are dependent on and affecting other industries in certain ways. Furthermore, as globalization emerges, these economic systems are expanding beyond geographical and physical boundaries. Industrial policy may be expressed in terms of voluntary adoption by enterprises, through an incentive system of investment, for instance. The government may provide special concessions for an industry's R&D, import taxes or special export subsidies. On the other hand, the government might impose mandatory requirements or restrictions on an industry; for example, free-to-air broadcasting companies may be required to broadcast a certain number of hours of national program content during a particular period or hours of the day. The government exercises its authority by regulating the industries to serve its own desirable ends, in policy terms.

4. Industrial Development

Porter (1980) defined industry as the group of firms producing products or services that are close substitutes for each another. Industrial development refers to the level of advancement of a particular industry. It is the collective level of performance of the companies within an industry

or industrial sector. It could be affected by either horizontal and/or vertical structure in the industry. Horizontal structure refers to the level of competition within the industry, while vertical structure refers to the efficiency of the supply chain for the industry. Economic efficiency is manifest in the productivity of resource utilization in an industry. Competition can promote industrial development by driving the participants in the industry to be more efficient in resource utilization. The environment within which an industry operates is vital for its development. If the environment is favorable for competition and efficient operation, an industry may flourish, as individual participating organizations are able to operate effectively and efficiently; thus, the collective performance and/or advancement of the industry should be enhanced.

Industrial development is the mechanism through which organizations can be most advantaged or disadvantaged by government policies, legislation, regulation, and interventionist activities, i.e. creating a favorable or unfavorable environment for industries. Governments formulate strategies and plans to build the countries' competitiveness by creating and providing favorable conditions for local companies to survive and/or thrive in the local market in their respective industries (Porter 1990). This can be, and often is, extended to creating an environment which will facilitate superior, and usually protected, exports in those industries that are favored. Sometimes, it even extends to bilateral agreements between countries to offset the sale of one industry sector's products for another in the reciprocal country. Such a situation can be used very effectively to generate exports and/or open up the market in a controlled manner.

The government may protect a market or a technology, or insist on employment of local country citizens for the favored industries. For example, the US government uses its economic power to open up overseas protected markets to US products. The US has economically forced Japan to accept a certain level of telecommunications equipment from US manufacturers as a bilateral arrangement for Japanese car exports to the US. Otherwise, the US would raise the import duties on

such items and make them unattractive in the US market. The manifestation of barriers to entry is evident in the telecommunications industry, by way of countries adopting or creating multiple standards for various equipment, that, in general, are quite different for Europe, the US and Japan. Very high market entry barriers can be created that, in general, protect the local industry and/or force technology partnerships where cross-border companies combine through joint ventures (JV), or some similar organizational arrangement, to develop and supply products with foreign, non-native, standards based equipment. This is particularly important in the information technology sector, which is crucial to contemporary economic growth, as highlighted by the Japanese government "e-Japan"[2] initiative (MPHPT 2000). This "e-Japan" initiative, was evolved into "u-Japan"[3] initiative, which stresses ubiquitous coverage and usage of the Internet in Japan (MIC 2004).

The use of information technology started in the late 1980s, particularly with 'new packaged-software solutions, lap-top computers, mobile communications, and the use of the Internet [which are] some of the ways in which US companies began to redefine best practice and dramatically shift the productivity frontier' (Porter, Takeuchi & Sakakibara 2000, p. 80). Telecommunications is a significant industry in most countries and this industry generates and supports many other industries; thus, it is a prime

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[2] In January 2001, the Japanese government announced a "e-Japan" strategy to solve the Digital Divide issues in Japan, after Japanese Government formulated a basic policy framework for IT strategies in November, 2000. With this line, the IT Strategy Council adopted the goal of making Japan the world's most advanced IT nations within five years by: (1) building an ultra high-speed Internet network and providing constant Internet access at the earliest date possible, (2) establishing rules on e-commerce, (3) implementing an e-government, and (4) nurturing high-quality human resources for the new era. (MPHPT 2000)

[3] In December 2004, the MIC announced a "u-Japan" policy with the aim of achieving a "ubiquitous network society" in which anything and anyone can easily access networks and freely transmit information from anywhere at any time by 2010. (MIC 2004)

target for national industrial policy and development. At the same time, seeing that the services generated by telecommunications providers are so critical to the national economy, in terms of business growth for high end enterprise, as well as small and medium enterprises (SMEs), most governments introduce strong industrial development policies and regulation to make the services competitive and to act as an enabler to facilitate the country's economic growth, making it more economically attractive for local and global businesses. The emergence of the digital age makes the development of a country's telecommunications industry even more vital to the country's economic and technological development.

In general, critical industries such as telecommunications have a similar historical background of initial government ownership and infrastructure build. As a national economy develops, often the telecommunications industry is deregulated, competition is introduced, and eventually the incumbent government-owned telecommunications organization is privatized. However, due to the critical role of telecommunications in economic development, it is common for the government to implement strong legislative regulations on both the industry and the key players within the industry. Due to the nature of the development of the industry, from monopolistic to competitive, there is a legacy of asymmetric legislation, particularly in respect to the previously government-owned telecommunications organization.

5. Japan's post-war economic development

The phenomenal post-war economic development that took place in Japan is often referred to as a "miracle" (Johnson 1982). By definition, a miracle is '1 an extraordinary event attributed to some supernatural agency; 2a any remarkable occurrence; [2]b a remarkable development in some specific area...' (*Oxford Dictionary*). In other words, the Japanese miracle was attributed to extraordinary visible and/or invisible forces. Many scholars from different disciplines were attracted to study this phenomenon, some of whom traced recent developments (e.g Vogel

1979; Reischauer 1990; Van Wolferen 1989; Haley 1992; Patrick & Rosovsky 1976;, Pempel 1998, and Nakamura 1995). One of the most controversial reasons attributed for the occurrence of the miracle has been the dominant role of the Japanese government in the post-war economic development of the nation. Specifically, the focus is usually on how the government influenced the business environment, the industrial structure and business practices during the post-war era. The following two sections give an overview of the Japanese government and the government-business relationship.

6. The Miracle Workers

6.1 The Japanese Government and the Business Sector

A consideration of the whole regime of the Japanese government is beyond the scope of this chapter; thus, I shall concentrate only on providing an introduction to relevant aspects of the Japanese government's background and characteristics for consideration in this section.

Since the *Meiji* Restoration, the Japanese government has adopted a strong interventionist approach to Japan's economic and industrial development. The *Meiji* government took the economic development of Japan as a means to an end: that of defending Japan from being humiliated by foreign powers. The fall of the *Tokugawa Shogunate* was due to its inability to defend Japan against the unfair treaties imposed by Western countries (Nakane & Oishi 1990). Thus, the primary goal of the *Meiji* government was the development of capabilities to foster the economic growth and strength of Japan, as reflected in the *Meiji* slogan of "rich country, strong army".

According to Eccleston (1989), the *Meiji* government had been performing an active role in Japan's industrial development since their ascension to power in 1868. Because of the virtual non-existence of private investors and investment capital, the *Meiji* government itself ventured into mining,

military production, railways, shipbuilding and textile industries. It subsequently sold all but the military establishments to chosen private enterprises, the *zaibatsu*[4], to lessen its debts. The *zaibatsu* became the recipients of government's purchasing contracts and were used as an instrument to implement state policy through seeking to integrate profit with loyalty. Thus, a stronger relationship between the government and the business sectors, the *zaibatsu* in particular, was further cultivated. Japanese government policy, from the 1880s, was to develop 'relations of mutual dependence with the *zaibatsu* in particular to avoid antagonistic confrontation over the state regulation of market force' (Eccleston 1989, p. 109).

One of the common practices of post-war Japan was that bureaucrats and corporate personnel were recruited from a narrow range of elite universities. For example, in powerful ministries such as the Ministry of Finance and the Ministry of Industry and International Trade most of the bureaucrats were recruited from the University of Tokyo, which stressed nationalist thoughts. Such recruitment practices produced a group of bureaucrats with a similar pedigree who shared strong nationalist sentiments (Eccleston 1989; Johnson 1982). Further, it generated a strong old-boy network, not only within the bureaucracy but also between the bureaucracy and the business sector (Schaede 1995).

As graduates from the same class moved along similar bureaucratic paths in the government, at the time one of the classmates became a minister, existing senior officials from earlier student cohorts would resign from their

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[4] *Zaibatsu* (財閥) is a Japanese term referring to powerful business conglomerates, each *zaibatsu* was owned by a single family. The major *zaibatsu* were *Mitsui*, *Mitsubishi*, *Sumimoto*, and *Yasuda*. The *zaibatsu* had powerful influence and control over significant parts of the Japanese economy and national policy, from the Meiji period until the end of the Pacific War. The *zaibatsu* were abolished in 1945 and 1946. After 1947, numerous companies formerly controlled by *zaibatsu* came together as *keiretsu*.

posts to join the private sector (Taira & Wada 1987), thus creating space for contemporaries of the minister. Such behavior is a peculiarly Japanese practice whereby bureaucrats ensure that there is maintained an absolute seniority on the part of the minister. These former bureaucrats perform an important role in being able to have easy access to the ministry, thus keeping connected to it, and being able to influence government decision-making (Eccleston 1989; Taira & Wada 1987). In sum, the government-business relationship in Japan has been close since the *Meiji* era, and was extended through the post-war era by practices such as these.

Although the ruling party had little power to change the personnel comprising the stable bureaucrats in the Japanese government, some senior bureaucrats retire early and enter into politics in the Diet. As well as the movement of bureaucrats into politics, there is an important mechanism in creating close business-government ties called *amakudari*. *Amakudari* is the Japanese business practice of companies employing early retired senior bureaucrats in their forties or fifties as senior executives (Eccleston 1989). Hence, a cooperative culture and network environment was nurtured among the bureaucrats, the political parties and businessmen in Japan (Eccleston 1989).

An environment of inter-personal networking allowed businesses to maintain a very close relationship with the government and the political parties. The political parties relied heavily on funding provided by *zaibatsu* for their electoral campaigns (Waswo 1996). Consequently, the government created a favorable environment for *zaibatsu*, a situation which, in return, helped the government to achieve its economic objectives for the nation.

It has been well documented that Japanese businessmen and government officials share a sense of the importance of coordinated national development and generally adapted an expectation of government intervention in the course of achieving this goal (Magaziner & Hout 1980).

The development of this attitude could be traced back to the early industrialization of Japan in the *Meiji* period (Sohn 1998).

Japan's phenomenal post-war economic development has attracted attention from scholars drawn from a spectrum of disciplines, which they have used to try and understand the reasons for this success, and to develop theory to explain it. The following two sections introduce theories created by American scholars in the field of social sciences and the third section introduces a Japanese economic scholar, all of whom have attempted to explain the phenomenal post-war economic development of Japan. Reviewing this range of material provides a contrast: looking from outside Japan inwards, compared with reflecting from within Japan to explain the post-war economic miracle.

6.2 Johnson's model of the Japanese miracle

In *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975*, Chalmers Johnson (1982) surveyed the Japanese government's role in the Japanese miracle. Johnson's book provides an analysis of the government's role in the collaboration between the government and big business, which he claimed to be the central attribute of the Japanese economic system (Johnson 1982). He researched the history of personnel movements and chronicled events in Japanese government that led to decisions on specific industrial policy, industry structure, industrial development, and subsequent economic outcomes. The central assumption made by Johnson is that the Japanese government played an important role in the Japanese miracle; thus Johnson's research attempted to provide a thorough description of *how* the government, and the Ministry of International Trade and Industry (MITI) in particular, exerted positive input into the Japanese miracle. Johnson focused on the period of phenomenal economic success in Japan, which occurred between 1962 and 1975, when the average per annum rate of economic growth was double digit. Also he identified this period as a landmark of industrial policy and government involvement in Japanese business.

Johnson surveyed the development of Japanese political institutions from 1925 to 1975, focusing on the interaction and intervention that occurred among them and with the business sector. Having done this he created a hypothesis stressing the dominant role of the government in the Japanese post-war economic miracle. Johnson researched back to the pre-First World War era to find justifications for the root of nationalist bureaucrats; the development of the relationship between the government and the business sector; the intentions behind industrial policy during 1962-1975, and also the implementation of such policy.

Johnson started from hypothesis outlined above, and used it to criticize and disconfirm some of the rival hypotheses that emphasized factors from macro-economic and socioeconomic perspectives which were advanced as explanations of the miracle by Western schools of thought. These rival accounts focused on national-character (Benedict 1946) as a causal explanation (Vogel 1979) ; some proposed as a supposition that there had been no-miracle (Katz 1998; Weinstein 2004), while others proposed that the reasons for the miracle were unique structural features of Japan, as well as the free rider hypothesis, which saw Japan's low defense expenditure, preferential import treatment from the US, and low cost transfer of technology from the US (Duus 1998; Reischauer 1990) as the principal causes of the post-war economic success. From Johnson's perspective, these forces alone would not have been able to deliver the 'miracle' (Johnson 1982).

6.2.1 Disconfirmed hypothesis

6.2.1.1 Macro-economic and socioeconomic perspectives

The macro-economic and socioeconomic argument advanced by (Goto 1977) proposed that the Japanese government had used Keynesian macroeconomic policy successfully to manage and generate the post-war phenomenal economic performance. Keynesianism had its genesis in the 1920s and 1930s and claimed that interventions by the government to expand the aggregate demand of the nation would enhance national

income. Aggregate demand could be expanded by increasing the government's own expenditure, for example, spending on public infrastructure, and/or by cutting taxes, which would encourage consumers' spending (Sloman 2001). Thus, Keynesian policy, if implemented, would influence the level of output by monetary and fiscal policy that manipulated levels of demand.

Johnson rejected this argument, on the basis of his finding that Japanese government involvement was much broader than occurring just in the areas covered by classic Keynesian economic policy. For example, the Japanese government manipulated the import and export exchange rate during the post-war era to increase the demand for Japanese made products (Johnson 1982). Johnson also argued that the Japanese government did more than increasing aggregate demand through increasing the government's own expenditure and/or by cutting taxes, to generate the economic miracle. As such the Keynesian explanation fails to provide a sustainable hypothesis with respect to the essence of the Japanese government's involvement in economic planning during the post-war period.

6.2.1.2 National-character of cooperation

The national-character of cultural consensus, particularly cooperation, has been used as a hypothesis by Vogel (1979) to explain economic success in Japan. These national cultural arguments attribute Japan's economic success to the remarkable capability of the Japanese to agree with each another and to work together to achieve common objectives and goals. The hypothesis asserts that important actors in economic development, such as government bureaucrats, ruling political parties and business leaders, were able to reach consensus regarding the primacy of economic objectives for the nation as a whole and were able to agree mutually on the methods to achieve the objectives.

Johnson (1982) claimed that 'cultural consensus and a capacity to cooperate as explanations for the miracle' (p. 8) were overly generalized

as potential causal factors for growth. There were tensions within the government and between the government and business sector, in philosophy, overall objectives, and methods, in pursuing the nation's economic development. For instance, during the post-war economic development even the most fundamental principles of the emergency measures needed to be taken to rectify the economy were subject to antagonistic debates among the bureaucrats. Conflicts were based as much on political and bureaucratic differences as on genuine differences over policy.

The lack of cooperation created tensions, the result of which was extensive interference by the government to force cooperation and impose its economic initiatives. It is established in Johnson's (1982) research that the government had deliberately stimulated cooperation among the economic participants rather than it being actually 'natural'. Johnson's findings show that the Japanese government's bureaucracies, for instance MITI, had to exercise coercion to force various government ministries and business entities into specific arrangements (Johnson 1982).

One of the most well known examples of an attempt to force cooperation, one that failed, was in the automobile industry (Johnson 1982). MITI tried to restructure the Japanese automobile industry into three core sectors in the early 1960s, comprising two or three firms in each sector. In one sector, MITI officials wanted to restructure volume car production to consolidate production in Toyota, Nissan and one other and to merge all existing volume car producers into one of these three units. However, MITI could not bring about the cooperation and all the mergers that it desired. To further exacerbate this situation, in 1963, and in contrary to the spirit of cooperation and the plan, Honda, with a strong reputation in the manufacture of motorcycles, announced that it was diversifying into car production. MITI tried unsuccessfully to stop Honda, and, when it failed, Suzuki, Daihatsu, Fuji and Matsuda followed Honda into the volume car production business.

It is self-evident when one looks at the detailed empirical picture of how industry policies were shaped that cooperation was not a national characteristic. Further, Johnson (1982)found that cooperation did not happen during most of the first half of his study (1925 to 1950), thus the notion of the national character of cooperation is flawed because of the inability of this so-called characteristic to manifest itself during a crucial period under consideration.

6.2.1.3 No-miracle

Many economic analysts interpreted the outstanding performance of Japan's post-war economic growth as nothing more than the result of normal market forces, the whole world experienced unprecedented growth rate in the 1950s and 1960s (Duus 1998). It was argued that Japanese economic performance developed due to the actions and effort of private individuals and enterprises responding to the opportunities provided in free markets for commodities and labor. This situation occurred during the worldwide boom in 1950-51, as many countries stockpiled raw materials and other supplies, fearing a full-scale conflict might erupt in the light of the Korean conflict. Consequently, it is argued, during the Korean War boom a massive demand occurred for Japanese manufactured goods and exports, which Japanese firms were in a strong position to supply as they had spare industrial plants and equipment, and could draw abundant and cheap labor from the countryside. Weinstein (2004) argued that Japan, as a defeated country in World War II, had an abnormally low base line for measuring economic growth, thus the grow rate did not reflect a miracle but was merely a decade of recovery.

Patrick (1977) argued that 'while the government has been supportive' (p. 239), the main role played by the Japanese government during the post-war era was to create an environment for economic growth. However, Patrick conceded that normal market forces could not explain the 40 percent plus of output growth and half of the productivity growth of the Japanese post-war economic growth (Johnson 1982). According to

Johnson's research data, even though there were business opportunities during the post-Second World War period, as well as during the Korean War, firms in Japan did not have sufficient capital to capture the business opportunities that arose. It was the Japanese government that enabled firms to capture business opportunities by providing them with the needed capital.

The main vehicle for the circulation of capital that was used by the post-war government was the Japan Development Bank, which was created in 1951. Its main purpose was to provide capital to key industries at low interest rates to finance the purchase of new, advanced machinery and equipment. There were also a number of tax concessions for higher investment in industry. These capital injections at low interest rates and the tax concessions, which laid the foundations for Japan's economic miracle, were, from a conventional neo-classical perspective, contrary to normal market practices and could be seen as interfering with market forces. In summary, the Japanese government, through orchestrated policy and administrative guidance, created a pseudo-market economy that was anti-free market in nature and it was this that produced the exceptional outcomes. Therefore, the no-miracle hypothesis is unfounded.

6.2.1.4 Unique-structural feature

From the perspective of an argument stressing Japan's unique-structural features, it has been hypothesized that the influence of the "three sacred treasures" that were uniquely Japanese institutions could be seen as the reason for the post-war exponential economic growth. The unique institutions glossed as the three sacred treasures were constituted by lifetime employment, the seniority wages system, and enterprise unionism (Haruo 1980). It is claimed that these provided special economic advantage during post-war Japan, i.e. Japanese firms were able to obtain great labor commitment, lose fewer days to strikes, allowing innovation to occur more easily, and making it much easier to introduce better quality

control and, in general, produce more of the right goods sooner than their international competitors (Johnson 1982).

Johnson (1982) agreed that the three sacred treasures presented Japan with special economic advantages and said that they were among the important elements that enabled the improvement of Japanese post-war productivity. However, he stressed the fact that there had not been a systematic or well-formulated relationship established between economic growth and the three sacred treasures. The institutions of the three sacred treasures were a result of situational factors and the need to improve Japanese workers' productivity. Therefore, Johnson (1982) argued that the three sacred treasures were not the cause or driver of the phenomenal post-war economic growth. Johnson nonetheless agreed that the Japanese government worked hard at engineering these institutions to produce outstanding post-war economic growth. However, these institutions should not be seen as unique, naturally occurring institutional features of Japan – they were clearly fabricated as social constructions in the post-war era (Clegg 1990).

Johnson (1982) also claimed that, from an institutional perspective, there were other unique institutions in Japan; for example, the personal savings system, the distribution system, the *keiretsu*, government controlled financial institutions, and the low degree of influence exerted by shareholders, all of which Johnson considered more sacred and more influential in post-war economic development than the three sacred treasures. These combined institutions constituted a system that no individual or agency ever planned in its minutiae which has developed over time from many *ad hoc* responses to, or unintended consequences of, Japan's late development (Anderson 1974) and the pro-growth policies of the government. Taken together as a system, these constitute a formidable set of institutions for promoting economic growth. To sum up, the unique-institutions of the three sacred treasures explanation does not go far enough and therefore fails as anything more than a partial explanation.

6.2.1.5 Free ride

The free ride theory argues that Japan's post-war alliance with the US was the cause of Japan's exponential post-war economic growth (Duus 1998; Reischauer 1990). Three forms of free ride have been claimed: (1) lack of defense expenditure, (2) ready access to the major export market of the US, and (3) relatively cheap transfers of technology (Duus 1998; Reischauer 1990). Thus, either any single form of these free rides or a combination of them enabled Japan's remarkable economic development.

There is no direct evidence showing that the lack of defense expenditure could enhance a nation's GNP growth. On the contrary, during the same high-speed growth period, the cases of South Korea and Taiwan can be cited as examples of countries that were spending a higher percentage of their GNPs on defense expenditure, yet they achieved an even more spectacular economic result than Japan during this period (Johnson 1982). Therefore, it can be argued strongly that the lack of necessity for defense spending does not constitute a free ride.

During the initial post-war era, it was an established fact that the domestic market, not the export market, was the major consumer of Japanese products (Tsuru 1993). Therefore, the Japanese domestic market was the major fuel for economic growth and Japan initially had a low dependence on exports, even though they had preferential access to the US market. Comparatively speaking, during this period, Japan was less export dependent than other industrialized countries (Tsuru 1993); hence exports were not a major driving force of the post-war economic growth of Japan.

Japan imported virtually all the technology for its basic and high growth industries during the post-war era. Therefore, Japan received the benefits of high technology without the high sunk costs of R&D. However, Johnson (1982) argued that the importation of technology was a selective and extremely complex process; there was no free flow of technology into Japan as such. Moreover, MITI, working with the private sectors, controlled the formulation and execution of the importation of technology,

through industrial policy. The government played an important role in pricing bargaining, selecting and promoting importation of technology, contrary to the notion of a free ride.

In sum, these so-called free ride notions either individually or collectively do not explain Japan's rapid postwar economic growth.

6.2.2 *Johnson's argument: The role of the developmental state in the economic miracle*

Johnson (1982) stressed the dominant role of the developmental state in the economic miracle. A developmental state is characterized by setting precise social and economic goals, including what industries ought to exist, and what industries should retire. He argued that all governments intervene to influence their economies for various reasons; for instance, industrial safety and consumer protection, or to prevent monopolization. Thus, the focus of his study is not on whether the Japanese government intervened in postwar economic development, but on how and for what purpose the government intervened.

Johnson's study showed that the Ministry of International Trade and Industry (MITI) managed post-war industrial development in Japan by adjusting competition within individual strategic industries and by allocation of investment among the players in these industries, through the implementation of "administrative guidance". Administrative guidance refers to the legal authority of the ministries in the Japanese government to issue directives, requests, warnings, suggestions and encouragement to business enterprises or participating parties within a particular ministry's jurisdiction (Henderson 1975). Nevertheless, the power of the administrative guidance comes from government-business relationships that have been established since the 1930s. Respect for government, as well as the ministries' traditional nationalist approach to economic development and their control of investment capital have also been significant, in addition to various informal pressures that the ministries can bring to bear (Henderson 1975, p. 266).

The administrative guidance empowered by the government putting non-free trade tools in the hands of the economic bureaucrats. These tools included the authority and power to control overall foreign exchange and importation of technology, to choose industries for development, to dispense preferential financing, tax breaks and protection from foreign competition, to lower the costs of the chosen industries, and to order the creation of cartels and bank-based industrial conglomerates. These tools gave the bureaucrats the power to supervise competition as well.

Through administrative guidance, the ministries imposed various requirements on business, so as to achieve the preferred or planned outcome for economic and industrial development. For example, during the recession of 1965, MITI issued administrative guidance to coordinate investment through cooperative discussion. Financiers and industrialists were brought together to agree on how much each was going to invest in what kind of plants and equipment and to encourage promotion of mergers among medium and small enterprises (Johnson 1982). Thus, excessive competition was eliminated by government-facilitated communication and coordination among organizations. As MITI had indirect, but effective, control over the Japan Development Bank, which was the major source of capital fund during the post-war era, MITI controlled the flow of funds to the targeted industries and to the firms which followed administrative guidance. In other words, MITI exercised its power to promote industrial and economic development through intentional industrial structural change and growth.

In conclusion, Johnson's (1982) findings show that during the period of his study, the Japan government bureaucracy was a dominant force in Japan, and the first priority of the Japanese government was economic development. The government, MITI in particular, used administrative guidance as the major instrument to achieve the intended economic goals. Furthermore, the Japanese government was able to manage Japan's industrial structure to meet the changing economic environment and hence, generated the post-war economic miracle.

6.3 *Porter, Takeuchi and Sakakibara's argument*

In *Can Japan Compete?* Michael Porter, Hirotaka Takeuchi and Mariko Sakakibara (2000) extend the work done on Porter's (1990) *The Competitive Advantage of Nations* by addressing an incidental finding, that there exists a duality of a competitive and an uncompetitive Japan. Porter et al. (2000) critically investigated current Japanese economic performance from strategic management and economic perspectives. They used the global market shares of the Japanese product in particular industries as the proxy measurement for their competitiveness. Porter et al. (2000) conducted in-depth case studies of twenty competitively successful, and seven unsuccessful, industries, which formed the basis of this analysis. They used Japan's world export share in the 1990s as the indicator for identifying competitively successful industries. There is no definition given for unsuccessful industries; however, these industries are positioned as failures, apparently based on the lack of exports. It is intriguing to contrast this with the definition of competitiveness as used by Porter et al., where in the same analysis they state that 'while export share per se does not define competitiveness at the national level, the pattern of export share changes reveals important signs about the health of competitive vitality and productivity improvement in the economy' (Porter, Takeuchi & Sakakibara 2000, p. 10).

For the twenty-seven focused industries, Porter et al. (2000) analyzed government policies on market entry, rivalry, operational subsidies, technology, suppliers and demand, industry by industry. Also they looked at Honda, the key players in the games industry, e.g. Nintendo, Sega and Sony, and four relatively new, emerging and high performance companies, e.g. Nidec Corp., Rohm, Kyoen and Shimano. Porter et al.'s analysis sought to demonstrate that competitiveness is not only based on operational effectiveness but that it also requires strategic focus.

Porter et al. (2000) examined and subsequently rejected the dominant role of the government model proposed by Johnson (1982), as well as the role

of Japanese management, as explanations for the phenomenal industrial development in Japan. Porter et al.'s findings, by analyzing the successfully competitive and unsuccessful companies, discovered that in general the more the government has intervened in industry, the less competitive is the industry. They insisted that the role of the government is to create favorable microeconomic business environments, which facilitate flourishing competition and business operations, and not to intervene in industrial development, which will have a negative influence on competition and will ultimately adversely affect corporate and national economic performance.

6.3.1 Disconfirmed model

6.3.1.1 The Japanese government model

Porter et al. (2000) summarized the building blocks of the Japanese government model as comprising (1) activist, central government with a stable bureaucracy (most of all MITI); (2) targeting of priority industries to enhance economic growth; (3) aggressive promotion of exports; (4) extensive guidance, approval requirement, and regulations; (5) selective protection of the home market; (6) restrictions on foreign direct investment; (7) lax antitrust enforcement; (8) government-led industry restructuring; (9) official sanctioning of cartels; (10) highly regulated financial markets and limited corporate governance; (11) government-sponsored cooperative R&D projects; and (12) sound macroeconomic policies. Most of these building blocks are taken from the research done by Johnson (1982) in the late 1970s and early 1980s, which was based on information on economic growth during the post-war period up to 1975.

Based on current industrial performance in Japan, Porter et al. (2000) argued that the Japanese government has not been successful or effective in sustaining and/or enhancing the competitiveness of Japanese industries; rather, that idiosyncratic strategy and innovation within particular industries and companies were the reasons behind the economic prowess of the successful industries in Japan. Porter et al.

maintained that the Japanese government did stimulate early demand for selected industries, such as fax machines and robot manufacturing, and triggered innovation through setting stringent standards in energy consumption. But, this market stimulation was not sustainable because it lacked strategic focus. Also, Porter et al. argued that 'the true test of the Japanese government model is whether its application discriminates between competitive and uncompetitive industries' (Porter, Takeuchi & Sakakibara 2000, p. 44). The results of Porter et al.'s research does not support the proposition that the Japanese government model was consistently present in the competitive industries.

Porter et al.'s (2000) overall analysis shows that the government has exerted intervention but that in general this does not enhance the sustainable competitiveness of the industries. On the contrary, Porter et al. stated that, in general, government intervention actually has a negative impact on the competitiveness of the industries in Japan. Thus, in the light of hindsight, Porter et al. rejected the Japanese government model as an explanation for the Japanese economic miracle.

6.3.1.2 The role of Japanese management – the "corporate model"

Porter et al. (2000) referred to the role of Japanese management as the "corporate model" which stresses high quality, low cost and lean production; produces a wide range of products; implements permanent employment; possesses strong inter-corporate networks; develops long-term goals; uses internal diversification as a means to grow high-growth industries, and has a close relationship with government. The Japanese corporate model does enhance operational effectiveness. However, according to Porter et al. (2000) the model leads to: absence of short-term focus and the neglect of shareholder value; unhealthy return on investor's funds, and a "me-too" mentality for delivered products. In real terms the Japanese corporate model creates uncompetitive business practices, and most of all, it lacks strategic focus. Thus, Porter et al. claimed that these

Japanese management practices did not enhance the sustainable competitiveness of Japanese companies, rather they dragged Japanese companies into markets where operational effectiveness and innovation, once normalized, left price as the only competitive variable, which is an antecedent of low profitability.

Japanese management systems may underscore continuous improvements in operational effectiveness, in terms of cost and quality; however, operational effectiveness is not a sustainable competitive advantage in its own right. Porter et al. suggested that since Western companies have learnt from their Japanese counterparts to improve their operational effectiveness, operational effectiveness no long provides advantage to Japanese industries over their competitors. The authors also pointed out that due to the extensive sharing of information among business participants within an industry, they gravitate towards competitive convergence, i.e. all companies are serving all types of customers by offering the same products. This practice leads to competition based on price only, and as a result, a poor return on equity and profitability. Lack of focus on profitability is a chronic syndrome of Japanese business. They attribute this low profitability to the absence of strategic focus, which does not allow companies to differentiate themselves and address focused market segments. Once the international competitors matched the Japanese operational effectiveness, their lack of strategic focus hindered Japanese industries competitiveness, Porter et al. (2000) argued.

6.3.2 Porter et al.'s "Prescription to Fix Japan"

In the absence of any sustainable model based on contemporary explanations for the Japanese economic miracle, Porter et al. (2000) applied Porter's (1990) diamond theory, and investigated the microeconomic business environment, as a conceptual framework to explain the elements that create the competitiveness of any Japanese industry, and to provide a "prescription to fix Japan" (Porter, Takeuchi & Sakakibara 2000, p. 16).

There are four elements that make up the diamond theory in the Japanese context: these are (1) access to specialized inputs, i.e. factor (input) condition (2) Japanese home demand, i.e. demand conditions; (3) local Japanese rivalry, i.e. context for firm strategy and rivalry; and (4) related and supporting industries. Porter et al.'s (2000) findings indicate that when the Japanese government creates an environment with a desirable level of the four elements in the diamond theory, the embedded industries will be successful. When the government protects an industry from competition by creating a false economy, the industry tends to be unsuccessful.

In conclusion, Porter et al. (2000) argued that they have disconfirmed the hypotheses of models that stress the role of government and models of the unique role of Japanese management, and have established that the government's role should be to improve the micro-business environment for productivity and competition but not to be directly involved in the competitive process.

Having looked at how two American scholars, Johnson (1982) and Porter et al. (2000), retrospectively and as outsiders, theorized post-war economic development in Japan, the following section reviews what a Japanese scholar, Shigeto Tsuru, who was at the time an insider, observed, and how he interpreted the Japanese government's role during the process of the nation's post-war economic development.

6.4 Shigeto Tsuru, an insider's view

Shigeto Tsuru[5] was one of Japan's most eminent economists, former president of Hitotsubashi University, who has had an active and significant participation in Japanese economic policy. For instance, during the post-war period he was a participant in the Economic Stabilization Board, the

predecessor of the Economic Planning Agency. In *Japan's Capitalism: Creative defeat and beyond,* Tsuru not only ventured a definitive work on the post-war economic development of Japan, he also 'related the subject matter to the evolution of Japanese capitalism in its institutional characteristics' (p. xi).

Tsuru (1993), with first hand experience and deep involvement in the post-war economic development process, provides an insightful economic view of the miracle. Tsuru's work does not theorize what caused the Japanese post-war economic miracle but rather it explains the miracle from an economic and historic perspective. As described in the forward of this book by the late eminent Harvard Professor John Kenneth Galbraith, Tsuru has 'performed the very highest level of historiography in marshalling of economic (and political) fact and its organization into a continuing and broad account, [and] has provided a calm and detached analysis on both private sector achievement and public policy' (Tsuru, 1993: ix). Tsuru interweaved economic data, historical events and his personal observation to offer a holistic analysis on the economic miracle.

Johnson's (1982) and Porter et al.'s (2000) research formulated theories to explain the miracle from an outsider perspective, whereas Tsuru's (1993) work provides an embedded account of the happening of the miracle. He presented the historical events from various aspects, i.e. the domestic and the international political and economic environment, and he postulated fundamental questions that could help explain the economic miracle, and set out to answer the following questions:

> (1) what were the major sources of effective demand which warranted the high rate of growth? (2) What was the role played by the government by way of simulating growth? (3) Was there a significant shift in industrial structure? If so, how was it brought about? (4) What was the fate of the erstwhile *zaibatsu* structure

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[5] Tsuru Shigeto (都留重人, 1912-2006).

> and the subsequent evolution of business organizations? (5) What was the impact of the single exchange rate, set in April 1949, on the country's external economic relations?, and so on. We must now turn to these problems in an attempt to provide a much fuller explanation of the "miracle" of rapid growth in the post-war Japan. (Tsuru 1993, p. 73)

Tsuru provided a detailed account of what the Japanese government did during the post-war era, considering a number of factors in addition to the most discussed aspects of administrative guidance. Tsuru summarized the essence of post-war administrative guidance in two stages:

> The first stage is likened to "treading on wheat nurseries" (*mugi-fumi*) which is the practice in the wheat field in Japan of strengthening young wheat plants by treading upon overgrown roots. The second stage is likened to providing of "mountain shelters" (*yamagoya*) which, if known in advance that they exist, are likely to have the effect of inducing mountain-climbers to become more adventurous than otherwise. (Tsuru 1993, p. 97)

According to Tsuru (1993), the Japanese government used investment coordination to implement its administrative guidance. In the steel industry, in the stage of *mugi-fumi*, the government coordinated the implementation of the "Rationalization Investment Plan", setting the aggregated target production capacity and its distribution among the competing firms through coordinated discussions among bureaucrats and industrial actors. In the second stage of *yamagoya,* by proposing a merger of the two biggest firms, Yamata and Fuji, the government sought to avoid the danger of excessive competition in the industry through coordinating cutbacks in operation throughout the industry. During the period from 1950 to 1974, the production of the steel industry grew 27 times, while its exports grew by 77 times. This is an example of how Tsuru enriched his account of economic development by interweaving economic data, historical events, and his personal observation to offer a holistic analysis. Tsuru described the intervention of the government administrative guidance as paternalistic, one which strives to 'strike a happy balance between competition at home and government support for sales abroad raising its productivity markedly in the course of events through innovations and the

scale of economy while improving the quality as well' (Tsuru 1993, p. 96). Tsuru also gave details of how the government was involved in economic development in terms of reclamation of factory sites, special tax-relief measures for industries, low-interest-rate policy, temporization of the trade-inflow and capital-inflow liberalization, and subsidies for water and electricity. He claimed that the Japanese government's effort in creating a favorable operating environment for industries enabled and enhanced industrial development.

To sum up, one of the major differences among these three scholars' approach was that the American academics were observers whereas Tsuru was an actor in the events and activities that manifested the miracle. Tsuru, as an actor during the post-war economic development period, has personally observed that the Japanese government both directly intervened or manipulated the targeted industries and firms, as claimed by Johnson (1982) and created a favorable business environment for firms to operate in, as Porter et al. (2000) suggested. Tsuru presented a balanced view, stating that Japanese government intervention was a positive influence and created a favorable environment in which Japanese companies could be extremely successful, based on operational efficiency in the form of low price and high quality. Tsuru did not go so far as to state that the Japanese government practiced extensive intervention; however, he highlighted that the nature of Japanese government involvement was very strong and deliberate and focused on achieving certain results.

7. Further research needed

Johnson (1982), Porter et al. (2000), and Tsuru (1993) attempted to explain how the Japanese post-war economic miracle occurred with special emphasis on the involvement of the Japanese government, prevailing economic conditions, and management practices. They all established that companies were responsible for the production of goods and services necessary for economic recovery and growth, and it was the actions of these firms that were fundamentally responsible for the

phenomenal output and business success, defined as the "miracle". However, they did not explain how the interorganizational forces relating the major economic actors, the companies and government, were interacting to achieve the miracle.

Neither Johnson's (1982), Porter et al.'s (2000), nor Tsuru's (1983) work has been conducted at a level where one could investigate how organizations, the fundamental building blocks of economic recovery and growth, have reacted to, or been influenced by, government policy. In particular, they did not look at how the organizations' responded to government intervention, a set of responses that subsequently yielded collective industrial development and competitiveness. Thus, theoretically, there is a gap, which needs to be investigated at an organizational level to gain a comprehensive understanding of how government influence takes place in the Japanese business context.

Porter et al. (2000) stated that the true basis for competition is profitability and shareholder value, not growth and market share which were the main drivers for the Japanese government and the basis of government policies and practices that organizations embraced. Operational efficiencies provided the basis for short term improvements and comparative competitive advantage. However, the lack of strategy and a truly market driven competitive environment could not sustain the competitive position. Therefore, although government intervention had short term benefits, it created, in the fullness of time, a counter competitive environment that lead to the demise of many Japanese companies and their market competitiveness and position.

The Porter et al.'s (2000) account is in tension with the views of Johnson (1982) and others who have hailed the policies and practices of the Japanese government as instrumental in Japan's post-war economic miracle. Johnson (1982), who first codified the Japanese government model in his book, *MITI and the Japanese Miracle,* has squarely put the accountability, (blame as outlined by Porter et al.), for the Japanese

miracle on the shoulders of the government. Johnson (1982), in contrast to Porter et al. (2000), did not have the wisdom of hindsight, i.e. sensemaking, when he wrote his book in 1982. At this time economists and governments and industries and organizations all over the world were in awe of the miracle that Japan had achieved and of the fact that the Japanese government shone out as the originator and driver of changes creating an economic engine for tremendously successful industrial growth, one that was capable of re-inventing Japan.

It may also be the case that Johnson (1982) concentrated only on selected industries and selected companies within these industries to explain the miracle, thus prejudicing the sample. Or was it truly the case that the Japanese government created the right competitive environment and that those Japanese organizations whose culture could not truly embrace and adapt to the competitive environment and create a sustainable competitive advantage through the early favored environment set up by the government, disappeared? This postulation would explain the miracle window, as well as the longer term demise of Japan's leading position in selected industries. It would also explain the basis for the tension between Porter et al's view and Johnson's view on the role of the government. However, it does not in any definitive way explain the gaps that are present between Porter et al and Johnson's views.

A theoretical orientation is needed to frame the research problem (Silverman 2000) to articulate and analyze this gap. The present research will be based on the concepts embedded in resource dependence theory (Pfeffer & Salancik 1978), Benson's model (1975) and competitive strategy (Porter 1980), as will be elaborated in the following chapter. This will enable analysis of how, if there is any effect, government policy and regulation influences the relationship among firms of an industry to produce a desired outcome.

Chapter Three – Theoretical Orientation

1. Unit of analysis

The aim of the present study is to understand how national policy works in the digital age and whether or not the empirical analysis of a specific and highly significant case study, the introduction of the third generation mobile technology in Japan, lends more support to the findings, argument and/or explanation provided by one or other of Johnson (1982), Porter et al. (2000) or Tsuru (1993). To make a comparison among these three perspectives requires an analytical framework that is not any one of Johnson's (1982), Porter et al.'s (2000), or Tsuru's (1993), one which is capable of forming analysis at the organizational level, and is clearly interorganizational in its focus.

The present study situates itself in the realm of organizational theory; the approach taken is to understand how the government exerts influence on organizations, the actions of which result in a collective effect in terms of industrial development. The level of analysis is the interorganizational network (Benson 1975). The first dimension of the interorganizational network is the network between organizations within the same industry. They are in the same layer of the industry and they are competitors in the same market. The second dimension of the interorganizational network is that which exists between an organization and key agencies in its environment, e.g. a government ministry. The government heavily influences the macrostructure of the industry, where the organizations exist and function. The government and organizations interact as governing and governed organizations respectively. However, government relies on the organizations in generating economic activity to create the nation's economic vitality.

Firms within an industry form an interorganizational network and have different power based on their size, financial strength, personal contacts, market share, technology and authority. This power affords them varying

levels of executable influence on competitors' behavior and decision-making. Therefore, the domain of the analysis is the interorganizational network where the dynamics of political economy take place. The following section addresses the theoretical forces holding and interacting within the interorganizational network.

2. Analytical perspective: resource dependence

The theoretical perspective adopted for the research draws on resource dependence theory, rooted in the conceptualization of organizations as a 'system': in particular, it draws on what Bertalanffy (1956) terms 'open-systems' theory. Bertalanffy (1956) conceptualized that closed system theory cannot apply to 'open systems', which characterize living entities, including individuals, groups and organizations. The crux of Bertalanffy's concept is that organizations as 'open-systems' are *dependent* on their environments for various *resources* which are essential for their existence, survival and growth (Spencer 1994). Organization theories have developed the importance of the environment for an organization. For instance, Levine and White (1961) argued that exchange or reciprocity is the force behind interorganizational structure. Katz and Kahn (1978) asserted that in an unstable and uncertain environment firms might attempt to manage their organization-environment relationships through mechanisms such as merger, to achieve increased stability and certainty. Yuchtman and Seashore (1967) claimed that resource acquisition is the fundamental decision-making orientation of business operations. Thompson (1967) identified that organizations are not autonomous entities; they have to depend on other entities that are beyond the control of the focal organization.

Pfeffer and Salancik (1978), working within the tradition established by Thompson (1967), constructed a comprehensive thesis that they termed the resource dependence perspective, a perspective that further developed open systems theory by enquiring into how organizations manage their environment through managing demand, altering

organizational interdependence, negotiating with other organizations and actors in their environment, and structuring environments in which to operate. Also, the resource dependence model focuses on interorganizational efforts to gain power and control over essential resources while minimizing threats to organizational autonomy (Cummings 1984), with autonomy being defined by Burt (1980) as the ability to pursue and realize interests without constraint from other actors in the social system.

In sum, the resource dependence perspective suggests that organizations are dependent on their environment for inputs that are essential for their functioning and which cannot be internally generated and, because resources are often scarce, organizations tend to compete for them (Goes & Park 1997). The resource dependence perspective examines at firm level the organizational phenomenon, and focuses on the interaction between the firm and the constraint and control exerted by its environment (Pfeffer 1982).

Organizations in different positions in an interorganizational network have different dimensions of power with which to negotiate and act, due to the asymmetric possession of resources within such networks. Organizations controlling scarce resources in a network will gain power by manipulating the resource flow within the network. Therefore, a resource dependency perspective enables a study of the dynamics of interorganizational interaction, in terms of the industrial level.

In the present research, the resource dependence perspective is used to examine whether and how the Japanese government manipulated industrial development through control over resources vital to a particular industry. Gao (2001) argued that direct state control of resource allocation and strategic resource allocation enabled Japanese post-war economic development. Thus, from this perspective, the Japanese government has been seen to have a history of controlling resources to promote industrial development during the post-war era (Gao 2001; Johnson 1982; Tsuru

1993). Johnson's (1982) model, Porter et al.'s (2000) theory and Tsuru's (1993) work will be inspected through the lens of the resource dependence perspective, to examine government intervention in industry, i.e. in terms of manipulating resources allocation, and the outcomes achieved.

Hakansson and Johanson (1988) characterized an industrial network as a process of interaction involving mutual and conflicting interests, and social aspects, as well as the exchange of instrumental resources. Thus, resource dependence perspectives provide a domain for analyzing networks where competition and cooperation co-exist. Competition, labeled as the invisible hand by Smith (1937), generates economic efficiency by enabling firms to optimally allocate scare resources. A firm realizing such efficiency will gain an advantageous position in an industry, because efficiency will enable the firm to outperform its competitors (Porter 1985). However, pure competition is a zero-sum game in an industrial context, where a gain to one firm is a loss to another (Jarillo 1988). In contrast, cooperation occurs when people or groups act together in a coordinated way to pursue shared goals, enjoy an activity, or simply further their relationship (Argyle 1991, p. 4). Cooperation usually involves not only the coordination of activities but also the sharing of the benefits that emerge from the cooperation (Deutsch 1993). A certain degree of cooperation will give collaborative advantage to competing firms, with the goal of deriving mutual benefit (Borys & Jemison 1989). An example of mutual benefit is market expansion by segmentation and differentiation; thus cooperation would not be a zero-sum game.

Pursuing a balance between competition and cooperation among industrial players seems to be a conflicting situation. However, by looking beyond the apparent conflict and embracing the co-existence of cooperation and competition within an industry, a new paradigm may emerge. For example, in this study, the phenomenon of cooperation is predicted to exist in the highly competitive mobile telecommunications industry, because of the mandatory inter-carrier relationships and service connectivity, the nature of

the customers, the sharing of finite resources, e.g. radio frequency spectrum and mobile transmitting sites.

Government is considered as one of the most important elements in the environment. The effects of government policy on the competitive position of firms represent, in turn, important determinants of the firms' performance (Shaffer, 1995). Government policy can alter the amount of resources flowing into a network by altering the size of markets and demand for products in various ways, i.e. through government spending and changes in tax rates. Industrial policy is especially relevant to the analysis of networks and industry performance, because it exerts an impact on the targeted industry's operating environment directly.

The domain which the analysis will explore is the interorganizational network, in which the political dynamics of public policy with respect to managing aspects of the economy take place; the research argues that this interorganizational network is held together by resource dependencies. Therefore, Benson's (1975) conception of the interorganizational network as a political economy framework is most appropriate for researching this domain and supplies the key conceptual elements necessary for answering the research question: to what extent is the Japanese government able to steer the nation's economy in the digital age?

3. Analytical framework: Benson's theoretical framework

In *Interorganizational Network as a Political Economy*, Benson (1975) offers a two-dimensional political economic theoretical framework for analysis of an interorganizational network (ION) and its environment. The underlying theoretical mechanism is resource dependence and the governing discipline is political economy, with the central assumption being that the main orientation of executives' decision-making is resource acquisition for the operation; resources having been defined as money and

authority, which provides an excellent theoretical framework for determining, analyzing and understanding the gap that I wish to investigate, because it represents a coherent but independent model against which data can be cross-checked to see what support is offered for each of the three theoretical arguments which I examined, Johnson (1982) , Poter at el. (2000) ,and Tsuru (1993), with respect to the Japanese political economy.

In this framework the basic unit of analysis is the network of organizations, integrated by the resource dependencies that exist among them. The underlying assumption and framework focus of the model derives from Yuchtman and Seashore's (1967) view of acquisition and defense of an adequate supply of resources as the predominant concerns of organization decision-makers.

According Benson (1975), organizations may derive power from the centrality of their functions within a network, which depend on the internal network structure. Further the organizations' level of power depends on their linkage to a larger social organization, for example government. The centrality of their function may enhance the bargaining power of an organization within its network, while linkage to the larger organization may enable an organization to control resource flows within a network, via external forces. Government can manipulate the ION relationship or affect areas such as the functioning, position of the organizations, and efficiency of the organizations, by influencing the resources flow and/or balance within the ION.

Based on empirical research on government agencies, Benson (1975) used the concept of equilibrium for analysis of sentiments and cooperative interactions, which form a superstructure. When participant organizations are engaged in highly coordinated, cooperative interactions based on normative consensus and mutual respect, an ION is equilibrated. The equilibrium model comprises four equilibrium components: (1) domain consensus, (2) ideological consensus, (3) positive evaluation, and (4) work

coordination. Benson, Kunce, Thompson and Allen's (1973) research indicates that these components tend to vary in the same direction, that is, an increase in one component tends to relate to increases in the others, and a decrease in one component tends to be related to decreases in the others. The political economic forces embedded in the network govern this dynamic.

Benson's (1975) hypothesis is that unless there is an effect exerted by variables outside the four equilibrium components, the interaction among these components may produce circular processes of equilibration, moving the network toward or away from equilibrium. The external variables causing the development of an imbalanced system within a network could be lack of resources, i.e. money and/or authority, and mandate coordination, i.e. government-set guidelines in the health industry with which all affiliated and associated organizations or bodies have to work together to comply as required by legislation.

Benson's (1975) model provides a perspective and an analytical framework for conducting systematic research on how government policy or intervention affects industry. Theoretically, it does so through exerting an influence on the interorganizational relationship within an industry, based on the properties of the resources dependence perspective. The perspective captures the relationships among firms (interorganizational network) which exist and operate within the same realm of societal organization or macrostructure and the dynamic relationship among these firms and their environment (Benson 1975). Thus, this model provides a theoretical framework with which to examine whether and how a government influences industrial performance through manipulation of the interorganizational relationship that exists in the respective industry.

Hereafter, when I refer to 'Benson's model' I am defining it as a comprehensive model comprised of the theoretical framework and the equilibrium components within ION, as distinguished from 'Benson's framework' which is the two-dimensional theoretical framework articulated

by Benson in *Interorganizational Network as a Political Economy* (Benson 1975).

The current research explores the extent to which government is able to influence resource dependence in the ION in order to influence the industrial development of the mobile telecommunications sector. For example, there might be tension between the government's intervention and the power possessed by one or more of the firms in an ION, or it could be that the phenomenon of resource dependence within an ION exists beyond the control of government. While Benson's framework is used as the theoretical framework for the present research, a creative and open-minded approach has been taken in conducting the research.

In summary, Benson's framework provides a comprehensive analytical framework for the research. However, it needs to be expanded and adopted to accommodate the business context. The element of competitive strategy (Porter, 1980) will be introduced as the dynamic of the ION in place of the equilibrium components in Benson's (1975) model .

4. Dynamics: competitive strategy

In the book *Competitive Strategy: Techniques for Analyzing Industries and Competitor,* Porter (1980) identified five forces that drive industry competition. They are (1) threat of new entrants, (2) bargaining power of suppliers, (3) bargaining power of buyers, (4) threat of substitute products or services, and (5) rivalry among existing firms. Porter (1980) stated that government not only can affect or control entry into industries via regulation; it can potentially influence many if not all aspect of industry structure both directly and indirectly.

Government as a supplier or buyer can influence industry competition through the policies it adopts (Porter 1980, p. 28). For instance, US government seems to adopt an employment protection policy, where, for instance, it tries to discourage corporate organizations from moving employment overseas by imposing the requirement that Federal

government contractors have to locate their call centers in the US. From a resource dependence perspective, these forces could be affected by administrative measures such as setting high threshold to enter into business, e.g. high license fee.

5. Summary

Figure 1. Strategic political economy model depicts a summary of the theoretical orientation of the present research.

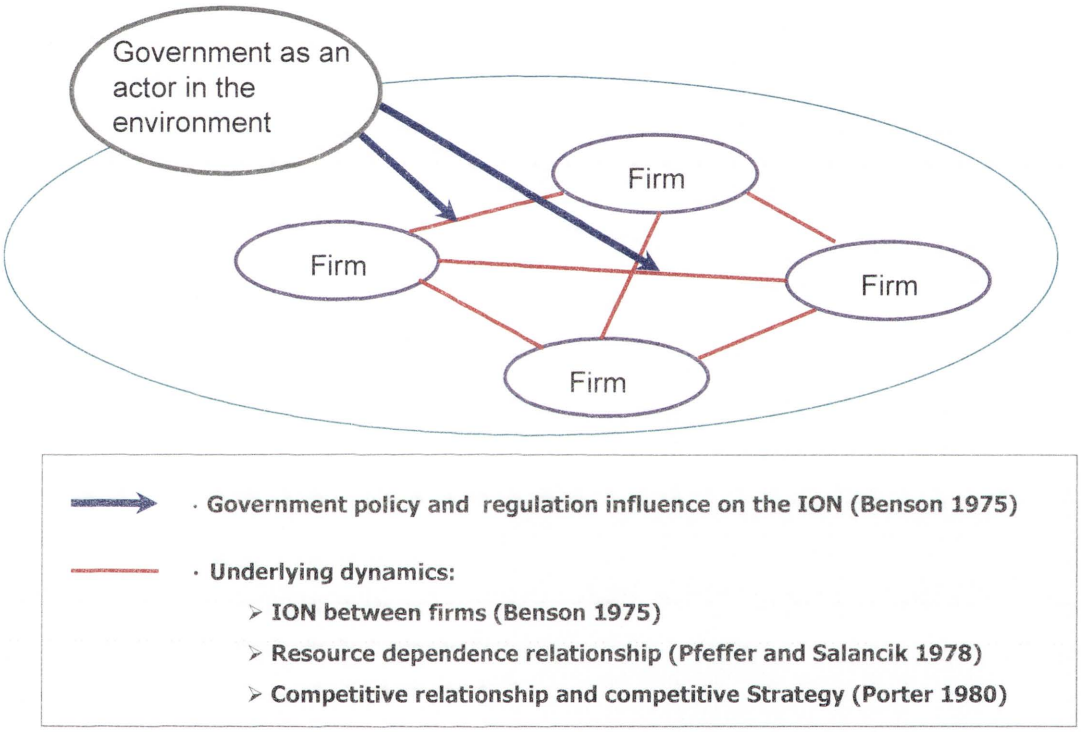

Figure 1. Strategic political economy model

In the Japanese context, which is the setting for the research, industry policy is defined as:

> [The] totality of government policies undertaken to change the allocation of resources among industries from what it would be otherwise, or to intervene in the industrial organization within a certain individual industry, with an intention to enhance the country's economic welfare if and when unrestricted functioning of the competitive market mechanism is found to fail in achieving that end. (Okuno-Fujiwara & Suzumura 1985, p. 3)

An explicit assumption of the present research is that Japanese industrial policy will have an impact upon the resource dependence dynamics within and between organizations in particular industries, i.e. government policy exerts influence on ION of industries. Looking at how a resource dependence perspective is embedded in Japanese industrial policy, it is appropriate to apply this perspective in studying the influence government has on organizations, in order to generate their intended results. Resources allocation and balance, which exist in ION dimension, are the underlying dynamics of competition.

During the post-war period of industrial development in Japan, the government had, by Johnson's (1982) account, invoked a fairly sophisticated system of interventionist economic policies to promote industrial development, and hence foster the nation's overall economy. Such policies have benefited from cooperative responses by the private sector. The government managed malfunctioning industries through an extensive range of measures, including administrative guidance, the government developed and generated the cooperation and coordination needed for economic development (Johnson 1982).

Mergers among firms were promoted by MITI with the intention of changing the positions of firms within their respective networks so that, as the size of the firms changed, the power position changed. Hence, the political economic forces within the networks changed. The Japanese government had major success in steering the post-war economic recovery and development through implementation of policies to reduce excessive competition within particular industries (Johnson 1982; Tsuru 1993), which changed the dynamics of ION of the relevant industries.

Given the definition of industrial policy stated above and the close ties of business and the government (Taira & Wada 1987), it is expected that the Japanese government would continue to exert influence over industry, particularly in terms of resource allocation and level of competition Thus, the government will continue their effort to advance industrial development

in Japan (Makino 1999), aiming at industrial efficiency gains through increased competition within the mobile telecommunications sector.

7. The research question

The research is motivated by the need to establish and then analyze a theoretical gap that exists with respect to explaining the ION relationship between government and organizations. It is intended to achieve this objective by answering the research question:

> To what extent is the Japanese government able to steer the nation's economy in the digital age? The research focus is on the industrial development of the mobile telecommunications industry in Japan.

The thesis will develop a theoretical model that is capable of explaining and predicting the dynamics between government actions and organizational behavior. The value of this model will be that it analyses the ways in which corporations and governments seek to develop appropriate practices, procedures and processes to obtain a more robust and sustainable business model. It will seek to identify the central power dynamics at work in this political economy.

Chapter Four – Hypotheses

1. Generating hypotheses from Johnson

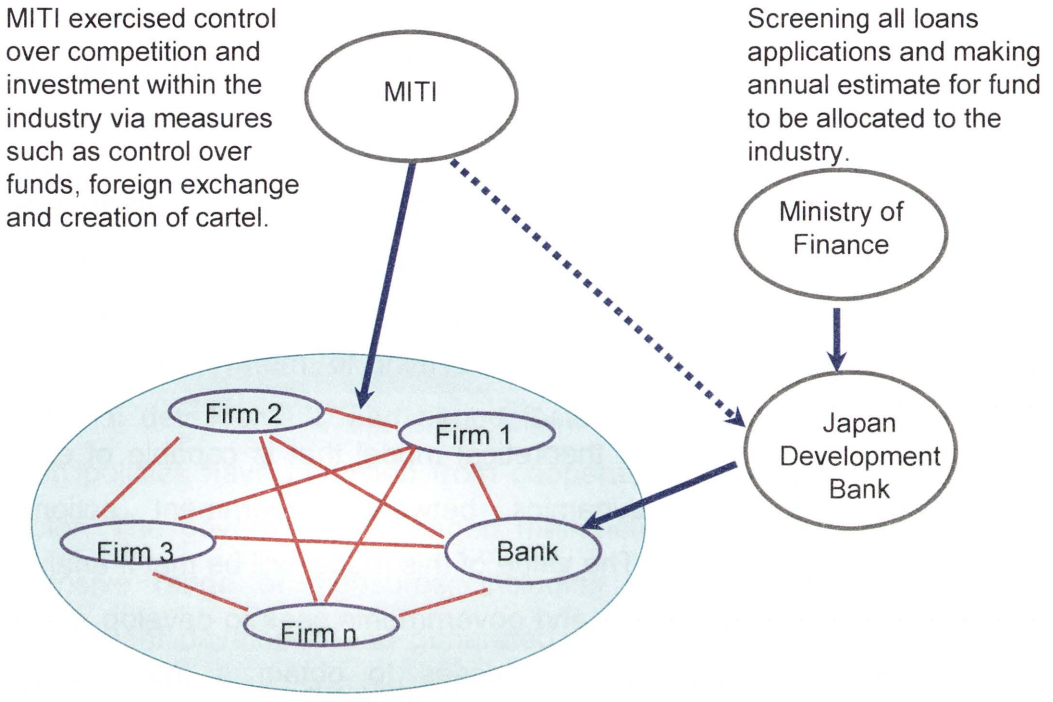

Figure 2. Johnson's (1982) government dominance model

Figure 2. Johnson's (1982) government dominance model illustrates government's role in industrial development in the post-war era. According to Johnson's (1982) theory, and extrapolating from it, one would expect the Japanese government to seek to influence the mobile telecommunications industry in order to make it more likely that it would play a designated role. Such role has been iterated by the Japanese government in the 'u-Japan' plan (MIC 2004). Also, from this perspective, one would expect the government to enhance the efficiency and effectiveness of the industry, which would affect the overall productivity and competitiveness of Japan. Thus, one would expect to observe, in support of this hypothesis, that the Japanese government would inject

resources into the mobile telecommunications industry to enable development of the industry; the recipients of such resources would be selected mobile players. Hence, success in the industry would be government-guided, in line with Johnson's thesis. It would also be expected that the Japanese government would facilitate communications among the major players of the industry for the purpose of steering the industry in accord with the u-Japan plan, a government desired direction.

Due to the underlying mechanism of resource dependency and political economy, the mobile players would have to embrace the government's goal as part of their operational goals; thus individual firms would have to play their designated role in the industry to achieve the collective goal that the government has for the mobile industry. Furthermore, the Japanese government, through selected initiatives would also manipulate the players in the industry.

Hypothesis 1a: The Japanese government intended to enhance the industrial performance of the mobile telecommunications industry through direct intervention.

By injecting resources into selected mobile players and/or manipulating the resource dependence relationship among the players, the positions of these players within the interorganizational network of the mobile telecommunications industry would be affected, thus the dynamics within the interorganizational network (ION) would also be affected. If the Japanese government has a designated role for each of the selected firms in the industry, it is likely that there would be minimum dispute over the domain of each firm. The Japanese government might promote ideological consensus in terms of technological interoperability among industry players to enhance overall industrial performance. The Japanese government would seek to dictate the role of each player and the role-relationship between players.

Hypothesis 1b: The Japanese government's direct intervention in the mobile telecommunications industry would affect the resource dependence relationship within the ION, and would have a positive effect on the industrial performance.

2. Generating hypotheses from Porter et al.

Porter et al.'s (2000) theory indicates that the Japanese government would create a competitive business environment for firms to compete within the domestic market first, then allow the competitive advantages of the industry to grow over time to facilitate global market entry and dominance, similar to the operational efficiencies of lower price and higher quality during the Japanese post-war economic miracle era. This argument is based on Porter's (1990) theory of "competition diamond" as shown in **Error! Reference source not found.**.

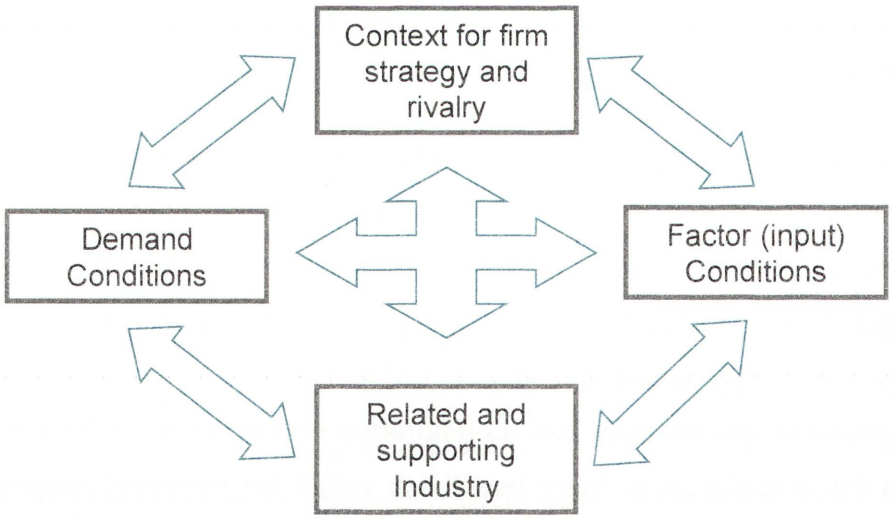

Figure 3. Porter's (1990) "Competitiveness Diamond"

A competitive environment would mean that there was a high level of competition in the industry. In such an environment, firms would be actively trying to take over customers and/or market share from their competitors through more cost effective operation and organization,

offering better price and/or value of service, product innovation, innovative marketing strategy and better service quality. Therefore, there would be a low level of domain consensus, as firms were actively trying to take over each another's market share and/or create or address niche markets. There would be low level of ideological consensus, as firms would seek to compete through their own strategies. There may or may not be a high level of positive evaluation among firms. Firms may view competitors' performance positively because their competitors' better performance would become the new benchmark from which to develop their strategy as well as a basis to increase performance. For example, if an industry player has successfully introduced a new technology or service to the market, this new technology or service would become a new standard of technology or service in the industry. On the other hand, work co-ordination among firms would depend on the firms' strategy and the potential cost and benefit could be realized by firms.

Hypothesis 2: The Japanese government would indirectly influence or intervene in the industry to enhance industrial performance through enhancing domestic market conditions, providing access to supporting industry, factor/input condition and context for firm's strategy and rivalry, to create a competitive environment.

3. Generating hypotheses from Tsuru

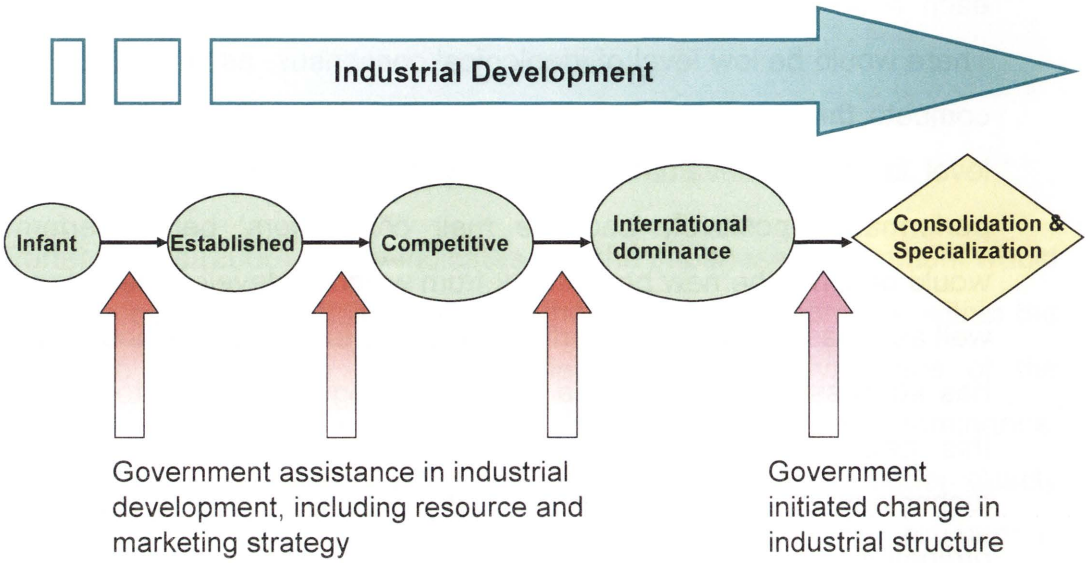

Figure 4. Tsuru's (1993) model

According to Tsuru's (1993) explanation of the role of the Japanese government in the post-war high-growth period, the government played a vital role in coordinating investment programs in major industries. This is illustrated in Figure 4. Tsuru's (1993) model. Thus, Tsuru's (1993) explanation is very similar to Johnson's (1982) model; both authors claimed that during the post-war era the Japanese government influenced industrial development through investment coordination and communication to promote cooperation within and without targeted industries. The Japanese government helped to avoid excessive competition in the domestic market, with both authors claiming that the Japanese government was able to manage domestic competition to a point where there was intense domestic competition to breed industrial export competitiveness.

Based on Tsuru's (1993) theory, one would expect to observe that the Japanese government would be closely involved in the development of a

targeted industry, in which the government considers assistance is needed to promote industrial development. The Japanese government would play a coordinating role in the targeted industry, as it did in the post-war era, through coordinating investment programs to control the size and production capacity of major firms, and level of competition in the targeted industries.

Hypothesis 3: There would be a phase-by-phase (or step-by-step) directive from the Japanese government regarding industry development, and the targeted industry would grow phase by phase according to the directives from the government.

These are the hypotheses that drove the research. In the following chapter I will elaborate the methodology that I have developed to address these hypotheses.

Chapter Five – Methodology

1. Research context

The research examines the extent to which the Japanese government is able to steer the nation's economy in the digital age. The research focus is on the industrial development of the mobile telecommunications industry in Japan. The mobile telecommunications sector is the fastest growing telecommunications sector, not only in Japan, but also in other countries. The researchcovers a period of 10 years from 1994 to 2003. 1994 is an important year for the mobile telecommunications industry in Japan, because in that year Japanese government deregulated the mobile handset ownership market. Also, during the period from 1994 to March 2007, mobile phone subscribers in Japan increased from 4.3 million to 101.7 millions (Soumu, 2007). Apart from the huge growth in the subscriber base, during this period Japan's mobile telecommunications industry went through other significant changes, such as the number of mobile telecommunications services carriers reducing from more than seven to three. The industry moved from a proprietary technology standard to an international standard, and this enabled Japan to catch up with other developed countries in terms of Internet penetration rate.

The mobile telecommunications industry provides an appealing context for research into the government's role in steering industrial development. It is a reasonably self-contained and clearly circumscribed industry, as well as an innovative institutional field. It provides a sound context in which to test the differing hypotheses derived from the main theories, which have previously been elaborated.

2. Methodology

The approach adopted by this research is a case study based on inductive qualitative research (Yin 1984), which enables an in-depth qualitative study that taps into knowledge and experience concerning what

the government has been trying to do, and illuminates both the extent and the means through which government policy and regulation affects the ION relationship among the mobile telecommunications companies. Using a case study provides an ideal methodology for holistic and in-depth investigation (Feagin, Orum & Sjoberg 1991). The research is guided by a grounded theory approach (Glazer and Strauss 1968) and driven by the data and cues collected from sources such as the literature review, interviews, structured and unstructured conversations with key players in the industry, and first-hand experience and observation in the industry, as well as close scrutiny of newspapers and official websites. The research has been a process of discovery, uncovering a story that emerged from my research question in an approach that enabled me to make sense of the reality in a step-by-step manner.

3. The Process

An overview of the process taken in this research is followed by detailed discussion of what, how, and why each of the actions is taken in this process.

Overview

The methodology used in this research provides an integrated approach. I conducted a literature review on the key aspects of the research topic, searching for and identifying an appropriate theoretical framework which would enable study of the research topic in a meaningful perspective. I identified gaps in existing theories about the research topics and formulated hypotheses with a view to addressing the gaps. Once the hypotheses were generated I entered into an interview phase where I used the hypotheses to generate questions, answers to which I thought would illuminate the research question. I used these interview questions to find out the different stories about what key stakeholders saw as the reality of the situation, from the informants' point of view: the focus was on the type and manner of Japanese government involvement in the development of

the mobile telecommunications industry. Based on the interview transcripts, I created narratives.

While repeatedly reading the transcripts and writing the narratives, I identified the three key resources which are critical to the mobile telecommunications industry in Japan. I conducted literature reviews on each of these resources and created data analysis which combined elements drawn from this literature with the narrative to give accounts of each of the focal resources in relation to the research question. Slices of narrative relevant to each of the resources are used to create an account that makes sense of the reality of government involvement in the mobile telecommunications industry. I have conceptualized the relationship between government involvement in the mobile industry and the level of competition in terms of a bell-shaped relationship, with the underlying ION dynamics. My analysis focuses on three scenarios located at different points along the bell-shaped curve. From these scenarios, and the results from the preceding steps, I make sense of the role of government involvement in the process of mobile telecommunications industry development in Japan. These scenarios are guided in their construction by the following principles:

- Being faithful to the themes which emerged from the data and the data analysis.
- Using government involvement as the key driver in the scenarios (McKiernan 2008).
- Considering the focal resources across the range of government involvement and created plausible outcomes in terms of ION dynamics and level of competition.

I lived in Japan from January 2002 to May 2005, working to conduct an ethnography of the industry, all the while enhancing my Japanese language skills (acquiring Level 1 Japanese Proficiency in December 2004). From 2001 to May 2005, I worked as a business consultant for a

consultancy firm whose main focus is on the IT and telecommunications industry in Australia and Japan. During my stay in Japan and beyond, apart from the formal interviews that I have conducted, I have had the privilege of talking to people working in different aspects of the telecommunications industry, both inside Japan and overseas. With these activities, I immersed myself in the country and culture and embedded myself in the telecommunications industry; it was this process of deep immersion that enabled me to make sense of my research.

I completed my field work in Japan and moved to Hong Kong in May 2005. From September 2005, I started working in the finance department of a regional mobile telecommunications operator in Hong Kong, my intended career development. Prior to commencing this research I was interested in working in the mobile telecommunications industry, mainly because of its importance in the modern business and its role as a key part of a 'modern' connected life-style as well as the complex and dynamic nature of the industry as a field for innovation – both social and technological. Beyond my expectations, working in this regional mobile telecommunications operator enabled me to gain further first-hand in-depth understanding and knowledge about the mobile telecommunications industry. Up to now, I have participated, in various ways, in interesting projects such as 3G license bidding and technology swap from CDMA to GSM. These experiences are highly relevant to my research, and enabled me to make better sense of my data and the literature.

I have summarized these actions in the research process schematic shown in Figure 5. The process of this research.

Figure 5. The process of this research

The process is presented as actions executed in a sequential order; however, the whole process was, in fact, a process of interactive data analysis. From the very initial stages, where I was contemplating doing the research, I trained myself to constantly think where is the data, how should I gather the data and how should I analysis it. I found myself constantly going back to various actions to look for new understanding and new cues; for example, I kept revisiting the narratives in parallel with writing up the data analysis as well as reviewing the discussion and conclusion. Further, throughout the whole process, I acquired new cues and enlightenment from talking to experts in the mobile telecommunications industry and from various literatures and from reading the latest news about the industry.

Action 1: Literature review on research background

My research interest is concerned with how government policy affects a nation's industrial development. Knowing that this research will be a long project, I understood that it is critical to choose an area of study in which I am genuinely interested. Before I started this research, I was planning to move to Japan and live and work there for few years, an intention that arose out of my personal interests and, as I am interested in a career in the mobile telecommunications industry, I therefore chose to focus my research on the Japanese government's influence over industry development in the new economy of the mobile telecommunications industry.

I conducted a review of the existing literature about how the Japanese government has influenced the nation's economy, to become familiar with the Japanese government's involvement in the nation's post-war economic development. I started with work produced by authoritative scholars such as Chalmers Johnson (1983), Michael Porter et al. (2000) and Shigeto Tsuru (1993) to shed light on the research topic from a social science perspective. This enabled me to acquire an adequate understanding of the existing scholarly work in the area of the research topic and enable me to identify gaps in the existing literature (Silverman 2000).

From the literature reviewed, I identified that neither Johnson's (1982), Porter et al.'s (2000), nor Tsuru's (1993) work, which I subsequently discovered, examined how organizations responded to government intervention and how a set of responses was created that subsequently yielded collective industrial development or competitiveness. Thus, I had discovered a gap, on which I could focused my research in order to fill in the gap. I investigated the gap at an organizational level to gain a comprehensive understanding of how government's influence takes place in the Japanese business context.

Action 2: Theoretical orientation

There is a large range of theoretical orientations available in the arena of social science; finding an appropriate theoretical orientation for research enables one to develop a clear focus on those aspects which matter and to create a consistent perspective throughout the research and the thesis. Without a consistent perspective, it would be impossible to perform holistic sensemaking of the research. I have identified as my key perspectives resource dependence theory (Greenwood 2008; Pfeffer & Salancik 1978) and a focus on ION relationships (Benson 1975) among the industry stakeholders as the appropriate arena for this research. Using these perspectives enables me to examine how and in what ways the Japanese government influenced the mobile telecommunications industry, and how this affected the resource balance in the ION relationship and the underlying dynamics for competition.

The research is focused on the need to establish and analyze the theoretical gap, identified in Action 1, literature review, in explaining the ION relationship between government and organizations. To examine this gap, I chose to investigate Japanese government involvement in a particular industry, the effect on the ION and the resource dependencies involved in the dynamics of the industry. To address these phenomena, I framed my research question:

> To what extent is the Japanese government able to steer the nation's economy in the digital age? The research focus is on the industrial development related to the mobile telecommunications sector.

This research question became a solid goal and direction for the research and a basis from which to formulate hypotheses.

Action 3: Hypotheses

I used the chosen theoretical orientation and research literature in the field to generate hypotheses. These hypotheses are based on each of the chosen major scholar's theory, as listed below.

Hypotheses based on Johnson's (1983) theory

Hypothesis 1a: The Japanese government intended to enhance the industrial performance of the mobile telecommunications industry through direct intervention.

Hypothesis 1b: The Japanese government's direct intervention in the mobile telecommunications industry would affect the resource dependence relationship within the ION, and would have a positive effect on the industrial performance.

Hypothesis based on Porter et al.'s (2000) theory

Hypothesis 2: The Japanese government would indirectly influence or intervene in the industry to enhance industrial performance through enhancing domestic market conditions, providing access to supporting industry, factor/input condition and context for a firm's strategy and rivalry, to create a competitive environment.

Hypothesis based on Tsuru's (1993) theory

Hypothesis 3: There would be a phase by phase (or step by step) directive from the Japanese government regarding industry development, and the targeted industry would grow phase by phase according to the directives from the government.

These hypotheses were used to suggest explanations for interpreting data related to the multiple phenomena of possible relationship between government involvement, ION, resource dependency and industry level development. These hypotheses were used to frame my fieldwork.

Action 4: Interview questions

I aimed to gather interview data which enabled me to look for 'facts' about the world (Silverman 2001), in particular the mobile telecommunications industry in Japan. To gather in-depth understanding about government involvement in the mobile telecommunications industry and what its effects

are, I crafted draft interview questions. These inaugural interview questions were designed to explore the hypotheses and were used as a springboard for developing and finalizing the interview questions; these inaugural questions are listed in Appendix A – Interview questions, and the final interview questions are listed in Appendix B – Final Interview Question. This final set of questions was a product of repeated re-work and pilot interviews.

The process was a slow learning curve; for instance, it was not until I tried the draft interview questions out on my acquaintances, that I realized that no formal social science language should be used in the interview questions. Inadvertently, this situation had crept in from my immersion in the literature, sometimes in ways that I had become so accustomed for taking-for-granted. I subsequently revised the questions and used this revised set of interview questions as a basis for conducting unstructured interviews in which I asked all informants the same questions, not using a limited set of response categories but rather using the interviews in a way that was designed to lead to open-ended answers (Fontana & Frey 2005).

Action 5: Interviews

1. Interviews with industry stakeholders

Interviews were conducted to gain a view of what industry participants think about where the industry had come from, in order to identify where the industry is now, and where the industry might be going. Interview questions were designed that were based on the theoretical orientation of the research, to gain data with which to craft empirically-based accounts and scenarios about how the government telecommunications bureau influences the industry ION. Another aim of conducting interviews with industry stakeholders was to gain insight into the policy and regulation of the telecommunications industry in Japan.

2. *Sampling*

Purposive sampling is used in the present research because it allows the research to determine the sample (Silverman, 2000): in this case the research has as its objective tapping into experience and knowledge about the process of government influence in the ION of the mobile telecommunications sector. Selection of interviewees was based on the candidates' experience and involvement in the subject matter.

My target sample was senior personnel in the mobile telecommunications carriers in Japan, and senior personnel in the telecommunications regulatory bureau of the Ministry of Post, Home Policy and Telecommunications (MPHPT)[6] and Ministry of Economics, Trade and Industry (METI)[7], as well as senior executives in the mobile telecommunications industry. MPHPT is able to exert direct influence on the mobile telecommunications sector through regulation and legislation. METI influences the industry by indirect influence over the mobile handset manufacturing industry in Japan, which is critical to the mobile carriers, and represents the government's major influence over the sector. Senior executives in the industry provide a story about the other side of the coin. The six informants, whose interviews have been transcribed and written in narrative format, are comprised of a balanced number of government officers and industry executives. Thus, stories from different perspectives could be obtained from different rooms as in the Tamara story-telling (Boje 2001). All informants are native Japanese. The backgrounds of the informants are detailed in Table 1.

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[6] MPHPT has been renamed as Ministry of Internal Affair and Communications (MIC), I used MPHPT and MIC interchangeably in this thesis, according to the informant and timing of the relevant context.

[7] MITI has been renamed as Ministry of Economics, Trade and Industry (METI), I used MITI and METI interchangeably in this thesis, according to the informant and timing of the relevant context.

Table 1. Summary of informants' background

Background of informant	Level of duty	Language of answer	Source of Introduction	Pseudonyms adopted in this research
Ministry of Internal Affairs and Communications (MIC)	Senior Executive	Japanese	Business associate	Mr. Suzuki
MIC	Executive	English	Research supervisor	Mr. Sato
Ministry of Economy, Trade and Industry (METI)	Executive	Japanese and English	Research supervisor	Mr. Ishida
Mobile carrier	Senior executive	English	Research supervisor	Mr. Kimura
Mobile carrier	Senior executive	Japanese	Business associate	Mr. Fujino
Telecommunications expert	Senior executive	Japanese and English	Business associate	Mr. Mori

3. *Obtaining contacts and finding informants*

Through my research supervisor and my personal contacts in Japan, I obtained initial introduction to potential informants. All informants, after being introduced, accepted my invitation for interview. I tried to cold-contact other potential informants by e-mail, such as company executives and authoritative figures in the mobile telecommunications industry. However, the success rate was zero. It is understandable that senior executives in the business sector and government bureaus in Japan would hardly entertain an unknown PhD student from Australia, in a country where Australian universities do not have a strong presence. I am privileged to have been introduced to high level personnel in both the government sector and the private sector in the mobile telecommunications industry. Once an initial introduction was given and invitation for interview was accepted, from my observation, the interviewees, knowing that the interviews were for a PhD research, were

very helpful in giving an account of what they knew in relation to the research questions.

4. Interview preparation

To prepare for the interview, I first set up the meetings with two weeks to one month's notice. Once the meeting was confirmed, I sent out the list of interview questions along with a synopsis and my personal résumé. The synopsis primed the interviewees with background information about my research. I was advised by a senior Japanese colleague that a personal résumé is helpful for the interviewees to feel more comfortable because it enables them to become familiar with the person that they will be dealing with and provides them some information about my background interests in their industry in advance of the meeting.

Phone conversations and e-mails with personal assistants of the interviewees, were conducted to determine whether there would be a need for an interpreter to attend the interview. In the cases where an interpreter was used, I had to adjust the length of answer time for questions based on time required for interpretation.

5. Conducting interviews

In general the venue and time of the interview was determined by the informants, and one hour was allocated for the interview. Before the interview commenced, I outlined to the informant that their identity would not be disclosed. I then asked for permission to tape the interview with digital recorder and to take notes by hand. All of my informants were comfortable with me to taking notes, and more than half of the informants gave permission to tape the interviews. Two informants answered all the questions in English; one informant brought along his personal interpreter to the interview and he answered all questions in the Japanese language; other informants answered questions in mixed Japanese with English.

Based on the preset interview questions, I started the interview. The interview process was interactive and I followed the flow by asking follow-

up questions based on the response of the informant. However, I maintained a non-influencing role throughout the interviews (Fontana & Frey 2005) by not expressing my personal view on the research topic. The interviews which were taped tended to be richer in terms of better interaction, as I could focus on the flow of the conversation, knowing the conversation was being taped. Interviews were only taped where informants agreed in advance.

Limitations

Time was a limitation as I had only one hour to conduct the interviews with no recourse to follow-ups. Language was also a limitation, because informants might not be able to fully understand the questions which were asked in English and consequently the answer given by the informants might not be fully answering my question. Also, the sample of informants chosen for this research was sometimes guided by accessibility to the relevant people.

Action 6: Transcriptions

The process of transcription of the tapes was challenging. It was not a straight-forward transcription process, because it involved language interpretation. Due to resource constraints, I had to perform Japanese/English interpretation for the transcription. Except for two tapes, I had to transcribe mixed Japanese and English language answers into written English, in the context of the questions. It was mandatory for me to revisit the tapes many times to improve the transcription (Silverman 2001) and interpretation. In general, this process was sufficiently demanding that it took at least 8 hours to transcribe one hour of recorded tape.

Initially, I considered using a computer program to perform qualitative data analysis. According to Seale (2001), the major advantages of computer-assisted analysis of qualitative data (CAQDAS) are (1) enabling analysis of large volumes of data, (2) improving the rigor of analysis, allowing one to count phenomena and search for deviant cases, (3) facilitating team

research such as development of consistent coding schemes, and (4) helping formulate sampling decisions. However, based on the characteristics of my research and my desired direction of data analysis, I chose not to use CAQDAS. This decision was based on the following grounds: (1) my research is a case study based analysis, with a relatively small volume of data, and my research direction was based on the analysis of this small volume; (2) English is not the informants' native language, the transcripts involved language interpretation, and my data analysis was not as mechanical as looking for repeated words; I also had to look for repeated context, which would not be gleaned through a CAQDAS approach; (3) this research is not a team research process, there is no need for "'nter-rater reliability' (Seale 2001), for developing a consistent data analysis throughout the research; and (4) I used theoretical sampling which was based on the introductions that I obtained.

The research interview involves addressing the complicated situation of the mobile telecommunications industry as well as familiarity with technical language and jargon. Literal translation of some of these terms, taken out of context, might lead the research into confusion. I have acquired Level 1 Japanese Proficiency during the research, which enables me to read, write, listen and converse in the Japanese language. I have a comprehensive understanding of the context and objective of the research and a solid grounding in the mobile telecommunications industry. These understandings, coupled with my Japanese language skills, placed me in a very good position to perform interpretation of the Japanese interviews for my research.

I sent the transcript to the respective informants for confirmation of the content. This ensured the correctness of the transcripts.

Limitation

My transcription did not cover non-verbal form of communication, such as facial expression. Due to resource constraints no backward translation was done on the transcripts. I did need to exercise my best bona fide

judgment in interpreting the interview. I did not transcribe incomplete and less relevant interviews and non-interview type of conversations which I had with a large number of telecommunications experts.

Action 7: Narratives

The action of creating narratives emerged as the best way to capture the depth of knowledge gained from the interviews and to help the readers to comprehend the interview result. Therefore, I chose to present the interview results in a narrative format. Based on each of the individual transcripts, I wrote the narratives as if I was the informant telling their respective stories in plain English about how the Japanese government involvement had an impact on the development of the mobile telecommunications industry in Japan. These were created as narratives through using my sense of understanding of the context and language to produce a coherent story-telling account of the informants' comments (Boje 2001).

I faithfully transformed the transcripts into narratives by repeatedly reading the transcripts and revisiting the tapes, and arranging the text into flowing stories. I did not subjectively construct the narratives but rather distilled them from the interview conversations to record faithfully the different points of view expressed. Technology descriptions and some mobile telecommunications concepts were elaborated to clarify the meaning and help describe the context and the environment in which the interviewees occurred. I did not develop an authoritative voice (Chase 2005) in the narratives. Moreover, I consider these narratives as joint productions of my informants and I (Chase 2005); the contents of the narratives were provided by the informants, while I re-presented these contents (Rhodes 2001) as stories with flows and elaboration in terms of technology jargons and context.

Limitation

As I re-presented the interview results in narratives, there were risks of misrepresenting the informants' views; also, this process involved a range of complex issues such as voice, representation and interpretive authority (Chase 2005). I mitigated these risks by exercising self-discipline, diligence and seeking understanding of technical terms and concepts through literature and expert guidance, during the process of writing narratives.

Action 8: Identifying key resources

Based on the repeated reading of the narratives and obtaining cues from the literature, several themes emerged and three of these, *amakudari,* technology standard, and frequency spectrum, were identified as key to the mobile telecommunications industry. These resources, which emerged from the data, proved crucial to understanding how the unfolding of the data enabled me to address the research question. After identifying these key resources in the mobile telecommunications industry as forming the focal themes for the research, I then proceeded to undertake in-depth research and analysis of how these resources were marshaled by the Japanese government, how they affected ION and influenced the level of competition in the mobile telecommunications industry. It was critical to identify key themes with which to limit the scope of the research; without restricting the scope to three focal themes, I would not have been able to finish my research within the required timeframe.

Action 9: Literature review on identified resources

After identifying *amakudari,* technology standard, and frequency spectrum as my focal themes, I entered into a substantial literature review of these themes that had emerged from the data.

In the arena of social science, there is a wide range of literature on *amakudari,* some on scholars' work topic related to technology standard, and hardly any literature on frequency spectrum. However, to address the

research question, I had no choice but to gain in-depth meaning and significance of technology standard and frequency spectrum in the mobile telecommunications industry. Understanding these two themes involved grasping many technical terms and concepts. I was required to invest a lot of time and patience to search for literature and learn to read literature from other disciplines, such as economics and technical specialists. It was challenging. However, through this process I gained understanding of the importance of these focal themes for the mobile telecommunications industry and the role of the Japanese government in mobilizing resources related to these themes to achieve their objectives; this literature review of the themes identified and their associated resources proved critical for the data analysis.

Action 10: Data analysis

At this point in my research, I had three focal themes pointing to related resources and a research question to answer. I made sense of my data by conducting analysis in a step-by-step process. I executed an in-depth analysis on each of the focal resources. Based on the literature review on the focal resources, I address three questions: (1) whether the focal resource is critical to the industry, (2) what is the role of the focal resource in the mobile telecommunications industry, and (3) how does the Japanese government mobilize the focal resource to achieve their objectives. I consulted both the literature and the interview based narratives in addressing these three questions. I re-read the whole set of narratives many times during this process to ensure that I was not missing important cues in the narrative or quoting the narrative out of context.

Action 11: The scenarios

A conceptual picture of the relationship between level of government involvement and level of competition emerged from my research around early 2005. During the interview phase, it was apparent to me that the relationships between government involvement and level of competition could be represented by a bell-shaped curve.

I used the technique of scenario planning which enables a systematic analysis of the key drivers of contextual change (McKiernan 2008) to make a focused analysis. The key driver in my research is government involvement; the contextual change is manifested in terms of focal resources allocation, ION relationships and level of competition. The three research themes pointed me towards the focal resources, which were put through the lens of the scenarios, and examined at a low, high and optimal level of government involvement.

The result showed a relationship between government involvement, lack thereof, and competition. Sensemaking emerged as the underlying process used to rationalize and explain the phenomena of ION effect, level of competition, and industry development. I used ideal-type narrative (Weber 1949) to construct the scenarios, the aim of which was to provide plausible accounts of government involvement and relationship with the ION, the level of competition and industry level development, in terms of the different hypotheses about these relations. The scenarios are not a historical account of what happened in the industry.

Action 12: Conclusion

In the conclusion, I holistically and critically viewed the literature reviews, hypotheses, data analysis and scenarios, and made sense of the entire research. To achieve this I retrospectively made sense of each of the areas individually and collectively. The key approach was to be reflexive about what I was making sense of, the research question, and critically evaluating whether the research question was adequately addressed. Viewing the research holistically enabled me to create a new wave of thinking and add to the body of knowledge in relation to the relationship of government involvement and industry level development.

4. Overall Limitations

This research has several limitations. First, I concentrate on one sector of the telecommunications industry in Japan. The telecommunications

industry is an important but also a peculiar industry: it is characterized by the existence of a previously mature monopoly and it is a sector that has had asymmetric legislation of the industry. Second, because of cultural differences, I might not have been able to fully comprehend the data obtained through interviews with native Japanese speakers. However, this limitation was largely mitigated by triangulation of my understanding with an extensive literature review based on the cues gained from the interviews. Finally, lack of opportunity to execute a feedback process with interviews: I commenced the fieldwork in Japan as a visitor and a temporary resident from January 2002 until May 2005; after this point there was no recourse to re-visit the interviewees for further discussions.

5. Ethical Issues

Ethical considerations of informed consent, right to privacy, and protection from harm (Fontana & Frey 2005) were addressed throughout the interviews. Informants were well-informed about my research objective by means of my research synopsis and the interview questions were sent to them prior to the interviews. I obtained acknowledgement from them of consent. Informants' identities were not revealed in the thesis, all names are pseudonyms, and this helped to protect informants from potential criticism arising from their points of view. Data obtained from interviews were designated and classified as confidential and stored in a secured location and will be used for data analysis purposes only.

Since the research involved human research an application for formal ethics approval was filed with Human Research Ethics Committee (HREC) of University of Technology, Sydney (UTS). This was done after the design of interview questions.

6. Summary

From the beginning of my research, I knew that I was going to do qualitative research; I had the vision of studying the interorganizational network, government involvement and industry development, and knew

that literature review, interviews, creating narratives and data analysis were the steps required. As described in this chapter, the methodology was well-planned and well-structured, which enabled the meaningful in-depth data analysis and the creation of plausible accounts for the research. Indeed, the process of developing the methodology was a sensemaking process. As Stewart Clegg (Clegg, Kornberger & Pitsis 2008) articulated it, sensemaking can be compared with driving, 'as you drive you interpret and try to make sense of other road users and pedestrians' intentions and behaviors, as well as of all the traffic signs around you. You are constantly making sense of a mass of detail, data and interpretation' (p. 18) In my case, I embrace this analogy and extend it to include the personal energy and control factors, where I compare my research to riding a bicycle! As a metaphor this emphasized that I needed to peddle continuously to exert energy throughout the entire research journey. I needed continuously to interpret and try to make sense of the data, the literature and other clues in and around my research. As I made sense of the data, I found myself exploring an unfamiliar landscape while traveling uphill. I encountered dead-ends where I needed to do U-turns, look for new clues, and find new paths. Along this journey, I reached several vantage points, from which I could make sense of the data and create plausible accounts which addressed various aspects of my research question.

Chapter Six – Narratives

1. Introduction

In this chapter, transcripts from the interviews, as attached in Appendix C, have been transformed into the form of narratives, in such a way as to ensure that there would be no modification in terms of the interviewees' meaning and (presumed) intent. Technology descriptions and some mobile telecommunications concepts were elaborated to clarify the meaning and help describing the context and the environment in which the interviews occurred.

The interviews took place between September 2004 and February 2005. At that time, Vodafone had already acquired J-Phone. J-Phone was formed in 1999 through the merger of Digital Phone Group (DPG, 3 local companies) and Digital TU-KA Group (DTG, 6 local companies, note that it is not TU-KA). Digital Phone Group was originally founded in 1991 as the mobile phone division of Japan Telecom. Japan Telecom owned a stake of 45.1% in J-Phone. In October 2001, Vodafone increased its share in Japan Telecom and J-Phone to 66.7% and 69.7% respectively. Vodafone thus acquired a controlling stake in J-Phone. On October 1, 2003 the name of the company and the service brand was officially changed to Vodafone. In the narratives, the story-teller refers to J-Phone as the entity or business prior to Vodafone's acquisition, and to Vodafone as the entity after the acquisition.

These narratives originated from senior executives and officials who hold or held positions in the mobile telecommunications industry and/or related government bureaus. They provided stories from a cross-section of the organizations that are the subject of this research. This mirrors Boje's (2001) Tamara of storytelling, through the interviews, I obtained stories from informants in different rooms. Pseudonyms have been used in the transcripts in Appendix C and in the narrative to protect the identities of the interviewees.

Narrative 1 – Mr. Kimura

Mobile carrier, senior executive

September 2004

There are two types of government ministries in Japan. The first type of ministry is the Telecommunications Ministry (which has changed its name to MPHPT). Their policy and goal is to stimulate the industry to generate more social benefit, but in many case, this is not necessarily effective. The Telecommunications Ministry determines how to regulate the rules inside the industry and how to regulate the big players to prevent them from becoming too powerful; this is the regulatory type of policy that it engages in.

The second type of ministry is METI, whose policy is to nurture and develop new industries and increase GNP. For example, in the automobile industry, the government did not advise Toyota to limit their growth because their growth would damage other companies' – competitors – growth. On the contrary, the government encouraged Toyota's growth, and praised them for their achievements and encouraged them to continue their expansion. The strong results of Toyota were used by the government to encourage companies such as Nissan and Honda to follow in Toyota's footsteps. The accepted and encouraged policy of the government is to make the top company in the industry stronger and then the total competitiveness of the industry will be enhanced.

In the developing state of an industry, if the regulatory body discourages the growth of powerful players, than all economic relations in that industry will be distorted. For example, in 1997, if the US government had stopped Microsoft's stellar growth, then we would not enjoy the current Microsoft software.

Many academics have tried to analyze the Japanese success in the 1960s and 1970s. My view is that the regulatory type of policy is most effective when an industry has matured. It does not necessarily work effectively in

the developing stage of an industry. Our nation's success is because of METI's policy and approach to nurture the big players and enhance them to be more competitive and realize stronger growth rather than through regulating the industries.

The approach of these two policies worked well before the IT revolution which took place in the late 1990s. After 1996 –1997, this approach failed because the IT industry is complex and cuts across all industries. In other words the IT industry cannot be identified as a single industry as in the former model. Thanks to the complexity of the IT industry and to the speed of technological development, the government could not keep up, so effective regulation was not possible in this high velocity industry. This situation was very beneficial for NTT Docomo to be able to more forward unfettered by regulation.

I recall that in the 1990s, the MPHPT had no regulation in place for the new Internet services, such as NTT Docomo i-mode, which we launched in 1999. Within 5 years, NTT Docomo covered one third of the Japanese population with 42 million subscribers. And thanks to this rapid growth, the government couldn't effectively intervene in this activity, which allowed NTT Docomo to achieve such a great result. During this time, METI tried to enhance other companies in the IT industry to become stronger. The METI's approach was to nurture the IT Industry by providing subsidies to some specific companies and providing support on how to set up schools and programs to nourish programmers, which has proven to be unsuccessful. This traditional METI approach did not work due to the inability of METI to keep pace with such a dynamic industry. In practice, both regulatory types of policy and enhancement policies couldn't work for the same reason of high velocity growth in the IT industry. The government's impact was neutral as they neither intervened nor stopped any company growth.

In 1999, it was well known that Japan was behind the developed world, in terms of IT penetration and PC penetration rates. The media identified that

the dominance of NTT was the cause of this situation. In my view this is not correct. Look at Japan now; we are the most advanced IT country in the world. This is due to NTT Docomo's i-mode services and to Mr. Son, CEO of Softbank, who started Yahoo Broadband around three years ago. Thanks to Mr. Son, the cost of broadband services in Japan was driven down rapidly and dramatically. Now, Japan offers the cheapest broadband services in the world, and we are very advanced in mobile, broadband and PC technology and penetration.

A major contribution from the government was to introduce ADSL and allow Yahoo Broadband, a new player, to immediately offer ADSL services. Mr. Son used ADSL technology, and the government to force NTT to open their dominant network to the new entrants. As the result, the government allowed free market forces to drive the ADSL industry.

In the mobile telecommunications industry, a carrier depends on many critical resources. In the 'Voice Age', as I call it, before the 'Multi-media Age', the only real dependent resource was the vendor, whom we depended on for manufacturing telecommunications handsets and base stations.

Now, in the Multi-media Age, for services like i-mode, we not only depend on the vendor, but we heavily depend on the content providers, IT solution providers and the internet backbone providers. Because without them, we cannot generate our traffic, or the subscriber cannot use the rich content on the internet. Now we depend on the IT industry people. Without their resources, we cannot do our business. We are depending on more external resources than in the past as we have moved from the Voice Age into the Multi-media Age.

It is my vision and my company's vision to cover all aspects of human life by mobile phones. We have covered one third of Japan's population with mobile handsets already, and we are now searching for new ways of fostering growth. This is why NTT Docomo installed an IC card into our customers' mobile handsets, so our customers can pay money using the

'wallet' phone at convenient stores. By offering this service, NTT Docomo is now depending on much wider industries, including the distribution, vending machine and transportation networks. Companies such as ANA and JAL have already decided to adopt this technology for validation at boarding gate entrances; we are now also depending on the airline companies.

Interconnection charges are only applicable when a subscriber makes a call from a cellular phone to a fixed line network. But most subscribers make cellular to cellular calls. NTT Docomo is setting up its own backbone, for cellular to cellular phone, we are not paying any interconnect charge. I see NTT Docomo as the biggest competitor of NTT East and NTT West, because our number of subscribers grows at their expense.

Radio frequency is a very important resource. Even though NTT Docomo has 56% of the subscriber market share, the government allocates the same frequency band width to all mobile carriers. KDDI is spoiled in this respect. This highlights the critical resource of human connection. In my view, KDDI has achieved corporate and commercial advantage in the frequency band width allocation, through their chairman, who was the former top person (director general) in the Telecommunications Ministry. This is a kind of Japanese custom, known as *amakudari,* where ex-bureaucrats join corporations. We welcome them, even though they are not necessarily creating any value to the company. In KDDI's case there have definitely been some beneficial results from this custom.

There is strong competition in the Japan mobile telecommunications industry, which is much more intensive than in the European market. European people think NTT Docomo is in a strong competitive position as we have 56% of the subscriber market share and we are a dominant player. However, in reality the competitive situation in the European market is easier than the Japanese market. The reason is very simple; in Japan we have a population of 127 million, which is big enough to support

three to four operators. These operators are not only competing on differentiated service but also on using different underlying technology systems to compete with each another. This is a different situation than in other Asian countries, where every mobile operator is using GSM; there is no competition between systems.

For the 2G, we use PDC network, which is the Japanese standard. For 3G, we are using UMTS, our competitors are using CDMA, so even in the system layer, we are competing with each another. That's why the competition is very intense.

I recall that after NTT Docomo was set up in 1992, there was not much competition up to 1994. During this period, consumers had to rent a cellular handset from NTT Docomo. In 1994, the regulation changed, the mobile service end-users could buy and own their mobile handsets, from any operators such as NTT Docomo and KDD. Then the demand for mobile phones exploded; in 1999 there were 25 million mobile subscribers.

Between 1994 and 1999, the first five years of new regulation, the operators competed for the voice phone business, which is happening in the Asian countries right now. The major strategy for the mobile operators was to move the voice demand from the fixed network to the mobile network.

During 1997, 1998 and 1999, the Japan mobile operators shared the same strategy of moving fixed network voice customers to their mobile networks. The business catch-cry was trying to keep subscribers by subsidizing mobile handsets; they were selling mobile handsets for as low as JPY 1. In the late 1990s we started to think about how to differentiate ourselves from other mobile operators. We started the i-mode service by embedding the Internet function and IT technology into the mobile phone handset. In 1999, we started i-mode; other operators delayed providing the same kind of service.

From 1999 to 2004 and beyond is the Multi-media Age, where there is increased competition. NTT Docomo changed the direction and the whole industry tried to put additional value, beyond the voice capability, into the phone and the service. For example, by embedding the finger printer authentication in mobile handsets we introduced secured access to mobile services, this allowed us to offer value added services such as e-wallet. These value added services have been the competitive engine to drive the industry for the past five years.

The government has assisted the mobile services industry and influenced its development, especially in areas of standardization of network technology. Standardization occurs among operators and manufacturers and the network and spectrum allocation and all network layer aspects.

The mobile carriers are changing to *de facto* standard: au[8] is changing from WAP to i-mode now. WAP technology was a great failure, which I predicted seven years ago. HTML is the de facto standard and from the content provider point of view, there is no difference now.

If the government had standardized the technology for application layer, some five to seven years ago, there would have been no revolution in the application layer. The government would have mandated all operators to adopt WAP, which was the dominant technology at the time, albeit a terrible technology.

Since the application layer is now strongly influenced by the IT *de facto* standard used in the Internet industry, we should follow this IT *de facto* standard. In the IT industry, there is no intervention from the government influencing the IT technology to be used. The government is however active in decreeing standards which are better for the network layer.

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[8] *au is the brand name of KDDI's mobile service.*

Consistency at the network layer facilitates capabilities such as roaming and connection between networks.

At this moment, there has been no obvious effect of legislation or policies to help open up the Japanese mobile market and access scarce resources by mobile carriers. However, the legislation regarding foreign ownership has allowed companies such as Vodafone to enter the Japanese mobile market.

It seems that the 3G technology used by Vodafone Japan will be the technology used in Vodafone Europe, and therefore Vodafone will have synergy with their overseas operators. This is in contrast with the 2G mobile technology, where Vodafone doesn't have any synergy, because they are using different systems.

From a competitive point of view, Vodafone will be able to challenge i-mode, the most advanced technology at this moment, as they acquire synergy through their overseas 3G operations. This threat has forced NTT Docomo to go overseas and create i-mode alliances with telecommunications carriers such as Telstra, the dominant carrier in Australia, to grow the economies of scale. Our current i-mode partners group consists of eight operators covering fourteen countries, which has an aggregated base of more than 60 million customers. Our alliance customer base is bigger than our number of subscribers in Japan.

In my view, the government regulatory body, MPHPT, exerts the most influence on the mobile telecommunications industry. They are very influential and have the power to set the rules. For example, they decided to introduce Mobile Number Portability (MNP) in 2006, which is very influential on the relationship among the operators; and this year, suddenly they have stated that the GPS function is very important and by 2007 or 2008, all the major mobile phone companies should have GPS capability for emergency incidents to help people. I can't say that the MPHPT influence is always contributory to the industry growth. I am not sure whether this GPS requirement will be a mandate, because in the US, the

government issued the same kind of requirement, but did not enforce it. The US government required all operators in US to support either GPS or cell-base location. It was requested that by summer last year everybody have this capability, but this has not happened. So, we see the MPHPT's request as a kind of guideline, but we have to do some work, because we cannot neglect the government's request.

The KDDI has already embedded the GPS function in their high-end phone, but not so many people are using it. From the NTT Docomo point of view, the R&D cost to provide this GPS system is not too high and even though the GPS function is not a money generating service, we are obliged to provide this capability.

In the mobile industry, the most important business performance factor is retention of the existing subscribers. How to lower churn rate and how to acquire new subscribers are key focuses of mobile carriers. We are competing with each another very intensely; as a result, we are gaining and losing customers every month. I predict that the volume of churn-in and churn-out would be much bigger after the government introducing MNP in 2006, because the volatility of the market will be affected by the lower barrier for subscribers to switch between carriers.

We are trying our best to be competitive; however, it is too early to be confident that NTT Docomo will be a winner after the introduction of MNP. Every year the situation changes, and therefore nobody can stay on top for an extended period of five or ten years. Two years ago, Vodafone celebrated their big success with sha-mail, but now, they are a loser. If you look at the current Japanese situation, the media is celebrating KDDI's winning, but four years ago, KDDI was a big loser. Three years ago, 'au' lost a lot of their subscribers because they were in the process of switching their system from 2G to 3G. NTT Docomo had a hard time last year while switching our customers from 2G to 3G service. We started 3G three years ago, and the main service take up took place this year, after the introduction of the 900 series handsets. The 900 series handsets

introduced the fingerprint security system which reflected the need for people to protect their privacy. This is especially important as a mobile phone is becoming an e-wallet and now the finger print authentication is becoming more important.

NTT Docomo is trying to win in the long-run, because short-run doesn't necessarily mean profitability in the medium to long-run. KDDI's growth in the past 5-6 years reflects this.

Japan Fair Trade Commission (FTC) is responsible for the legislation for all competition, for all industries. And as of last year, FTC is, once again, independent from the ministry. I believe the FTC are doing very well regarding their major objective of promoting competition, however they can do better and become more powerful. I think that they are gradually getting stronger and will take away some responsibility from the MPHPT and other ministries as well. However, their human resources are limited.

There are big disputes between FTC and MPHPT. Inside the government, the FTC is stating to MPHPT that it is their responsibility to check the dominance of the market. But at the same time, MPHPT is saying that NTT Docomo is too big and MPHPT have to regulate areas that can curb NTT Docomo dominance. Inside the government, there is tension between these government agencies and there are a lot of discussions regarding which policies should be done by FTC, and which policies should be done by MPHPT.

Narrative 2 – Mr. Ishida

METI, senior officer

September 2004

The industry structure for 3G and 4G mobiles in Japan has two components; the carrier business which is under the regime of MPHPT, and the handset business which is under the regime of METI. MPHPT's main concern for the carrier business is to create a favorable environment for mobile services penetration. The major aspects that MPHPT focuses on are security, connectivity and spectrum. Where as, METI's focus for the mobile handset business is to strengthen the handset industry which is a consumer industry. Our current priority in the handset development is on the semi-conductor chips and the flat panel displays. The mobile industry is moving up in importance within METI.

One of the differences between MPHPT and METI is that MPHPT uses regulation with enforcement. Whereas METI uses connection, dialogue, daily market information, investment companies, analysts and insider information. METI cannot order companies to do anything, but helps them to catch up with daily market information and offer free of charge consultation to companies. METI does not control the handset industry, but helps this industry to develop.

None of the Japanese mobile handset companies is among the top mobile handset companies in the world. One of the reasons for this is the mobile technology used in Japan is not compatible with other mobile standards in the world. Also the Japanese mobile handset companies are struggling after the dot-com bubble burst, and their cash and profitability declined. Therefore, they were lacking cash for R&D and marketing activities. So METI sees this as a favorable time to promote mergers and acquisitions (M&A) in the mobile handset industry. We want to reduce the number of handset manufacturers from ten to three, and we are aiming to have these companies become strong enough to enter into the European markets.

A recent example of M&A promoted by METI is in the LCD industry, where a joint venture was formed by Matsushita, Toshiba and Hitachi which took two years in the making. These players in the LCD industry benefit from the M&A, which is promoted and supported by the METI. These companies also benefit from METI's free of charge consultancy.

In Japan, there are three main mobile carriers, NTT Docomo, KDDI and Vodafone; these carriers have their specific mobile handset suppliers. NTT Docomo has mobile handsets supplied from NEC, Panasonic, Fujitsu and Mitsubishi. All of these handset manufacturers, in their own right, have strong ties with NTT Docomo. KDDI has mobile handsets supplied from Sharp and Toshiba. Toshiba is very strong in chipsets. Vodafone has mobile handsets supplied from Sharp and Sony Ericsson. Sharp is very strong in LCDs. In the mobile handset industry, chipset and operating system are basic technology; it is on the application layer where the differentiation happens.

Mobile handsets are very advanced in Japan. However, the industrial structure is disadvantageous to the mobile handset manufacturers seeking to develop and sell their products to overseas markets. Over the last ten years the competition in the mobile handset industry has declined, which has weakened the industry. It is because the handset makers are too close to NTT Docomo, they concentrate on producing products after receiving orders from NTT Docomo. NTT Docomo actually allocates the quantity of handsets to be ordered among the handset makers. This business model creates an environment where companies do not have any hunger for expanding their market overseas. Therefore the handset companies do not have the capability to create products for markets outside of Japan. They also lack marketing knowledge to develop mobile handset business in overseas markets. NEC is the only company, which has the desire to address the overseas markets.

METI provides financial assistance in the form of R&D subsidies, which nurtures and influences the telecommunications industry. For example,

there is a USD 25 million subsidies in R&D for a router project. METI is subsidizing NEC and Hitachi's new router joint venture. This will be a three year project commencing in 2004 and will be finished in 2007. We want to see Japanese companies making reliable and safe routers.

In the mobile telecommunications industry, the most critical resource that a carrier has to depend on the government to supply is radio frequency. The most significant policies and regulations affecting the relationships between the mobile telecommunications companies are also related to radio frequency. In the mobile business, volume of business depends on the volume of frequency available to be used by a carrier. So specific policies and regulation apply to radio frequency usage and allocation will affect the relationships among the mobile telecommunications companies. The allocation of radio frequency is under the control of MPHPT. Therefore, Radio Frequency Division and Land Mobile Communication Division of the Telecommunications Bureau in MPHPT are the government divisions that exert the most influence on the mobile telecommunications industry.

There might be a power game in MPHPT where the opaque decision-making process regarding frequency allocation takes place. Maybe there is rule, but the final decision is very unclear. The industry is also dependent on ICs, chipsets, displays and software, and human resources from software companies and other organizations.

NTT Docomo is a very powerful company with more than 200,000 employees, and has a strong influence over MPHPT. For example, the new tax to be imposed on Internet Protocol wireless phone (IPWP) might be from NTT Docomo. However, NTT Docomo is not really being favored by MPHPT.

The existing mobile carrier customers' monthly payment is around JPY8,000 to JPY10,000. The operators of IPWP (i.e. 802.11 a, b and g)

services might use a fixed price model. For IPWP, the charge might be around JPY5,000 per month. IPWP might be available around 2006-2007 and the carrier business model has to be changed, to face the competition from IPWP. METI is to promote this new industry and there will be a new tax imposed by MPHPT on IPWP.

There is too much competition in the handset industry, but not enough competition among the mobile carriers. Ten years ago, there were more mobile carriers than today, now there are only three, NTT Docomo, KDDI au, consider Tu-ka is operated by KDDI as well, and Vodafone. Maybe this is due to market forces rather than government induced structural change.

The regulation change in respect to limitation of foreign ownership in the telecommunications market has helped to open up the Japanese mobile market. Nonetheless, there has not been much effect on competition and the availability of resources due to the entrance of Vodafone, a foreign owned entity.

Competition and market domination will be decided by market efficiencies. However, if the combined market share of foreign carriers is too large, it might touch the national security issue. Telecommunications is a key industry and essential for an independent country. Due to national security reasons, the state has to make sure that our conversations over the phone would not be tapped into. It is an unacceptable situation to not have a Japanese company in the telecommunications industry.

The Japan Fair Trade Commission (JFTC) does have influence on the mobile telecommunications market, but it has limited power. The JFTC has a very small number of human resources and a very small budget. The result of the Japan Fair Trade Commission becoming independent (again) of MPHPT in April 2003 will have no change on the mobile industry. However, in 2003, a person with strong political power has been appointed as the CEO of JFTC. The new CEO has strong drive to do something new. We (METI and JFTC) are going to attack Microsoft. We would like to stop the spreading of Windows into consumer products. However, it does not

necessarily mean that it has to be a Japanese company to try to create alternatives.

There is strong influence on the industry through *amakudari*, the movement of people between senior positions in the bureaus and mobile carriers. There are over 30 former METI bureaucrats in the mobile carrier and handset companies. Sony Ericsson is a company that is an exception from *amakudari*.

Amakudari depends on negotiation between the human resource (HR) division of the ministry and the company. At the company request, the HR division of METI will provide a list of candidates. It is up to the division director to arrange or promote the arrangement. The final decision will be made by the HR, however, normally; the HR will follow the division's recommendation. Foreign companies also ask for *amakudari*, for example, IBM has requested for *amakudari* for a long time. Our Prime Ministry Mr. Koizumi wants to lower the number of *amakudari* over the next 5 years.

There are three levels of staffing in the ministry: director; middle; and without degree. In the case of a level one Director, by the time one of the staff from the same year achieves the top job, there will be nineteen people leaving the ministry, some of them may join the industry through *amakudari*.

Narrative 3 – Mr. Suzuki

MIC, senior executive

September 2004

The Japanese government has introduced competition through three layers: infrastructure layer, platform layer and application layer. A long time ago, when the Japanese government considered regulation on the telecommunications industry, we focused on the infrastructure layer. This was because the infrastructure layer was the core of the telecommunications industry and the provision of the voice service was the major telecommunications business. There is ubiquitous fixed line infrastructure in Japan, and there was no real change in the fixed line business, until the introduction of the ADSL technology, which enables broadband Internet services provided via fixed-lines.

In 1985, new regulation/deregulation was introduced, which allows new telecommunications operators to access the fixed-line infrastructure. Note, NTT retained the sole control over the last-mile. Since the new regulation/deregulation, the fixed-line telecommunications industry has moved from monopoly to semi-monopoly. The major difference between the fixed-line and the mobile telecommunications sector is that mobile services requires radio frequency. Radio frequency is an essential resource in the mobile telecommunications sector. There is limited competition in the mobile sector, due to the limited amount of frequency that is available to be apportioned to the mobile operators. This is not the case for fixed-line infrastructure which is not dependent on radio frequency bandwidth availability.

In Japan, the mobile handset quality is very high. Multiple services can be used via a mobile handset, i.e. voice, data, picture and image services which are provided through the mobile network. There are different mobile services delivery platforms in Japan, i.e. i-mode, ezweb and Vodafone Live!. They are competing against each another.

It is the government's responsibility to create an environment for competition and open up the monopoly network. There is also an e-Japan initiative which uses regulation to enable the construction of a ubiquitous IP world where applications can be developed in an open environment.

The Japanese government allows wholesale models in the mobile telecommunications sector, and Mobile virtual network operators (MVNO) can offer mobile services. For example, Nippon Tsushin intends to offer services on DDI Pocket's PHS network, which is currently under negotiations. However, it seems that there is no good business model for the Nippon Tsushin to operate as an MVNO, also, there are some technical obstacles in actualizing the wholesale model.

The lack of a wholesale model is partly due to the mobile handset-dependent business model[9]. In Japan, if an MVNO wants to resell mobile services, it has to sort out the handset issue, as a particular mobile service wholesaler has its own technology and own particular handsets. This involves a huge investment to realize an MVNO business model.

There are five factors determining the competition environment in the mobile services sector. The first is market expansion. Ten years ago, the fixed-line telecommunications business was very profitable, but there was not much profit in the mobile business. It was not expected that mobile business would become such a big business. Therefore, the government allowed NTT Docomo to decide the mobile service price level, NTT Docomo set a high price for their mobile services.

Second is the right to determine pricing level. Now, mobile operators have the right to set pricing level with no need to obtain approval from the

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9 The Japanese mobile industry is characterized by a number of networks which have exclusive accessed through handset which are designed for that network, and that are not usable on other networks. This has created a handset-dependent business model.

Telecommunications Bureau. This creates an environment where carriers can create new services and offer them to their customers at acceptable and profitable prices. Although they can set their own pricing, they must be conscious of the impact of their pricing in the market where other carriers can also quickly change their pricing.

Third is the introduction of the mobile number portability (MNP) system by the government. In one and half to two years, the government will introduce mobile number portability in Japan; mobile service customers will be able to change their mobile service providers while keeping their original mobile numbers. For mobile customers, it has been a hassle to change mobile service providers, as they cannot take their existing number with them. This lack of number portability makes it very problematic to change mobile service providers.

Fourth is the introduction of mobile service flat rate charges. With flat rate charge billing in Japan, the mobile service charges are now deterministic, affordable and relatively less expensive than in the past. It is very convenient to use the multiple services provided by mobile service providers, and as consumers use more of the services, they pay more, which leads to high mobile average revenue per user (ARPU) in Japan. Although the overall mobile service price is high in Japan, penetration rate of mobile telecommunications is very high. The relationship between flat rate charges and usage is the same in the fixed-line market, when 10 yen (or now 8.5 yen) per three minutes is cheap, and the service is convenient, that's why consumers use more of the fixed-line service.

Fifth is the entrance of new players. Initially, NTT Docomo was the monopoly in the mobile service sector; but now in addition to NTT Docomo, there are au, Tu-ka and Vodafone in this market. Due to the limited availability of radio spectrum, the earliest time another player, Softbank, can join the mobile telecommunications sector is in 2006.

Narrative 4 – Mr. Sato

MPHPT, senior officer

September 2004

In 1994, the MPHPT introduced the Customer Owned and Maintained (COAM) system legislation and mobile handsets could be purchased by consumers. Since then there has been more competition in the mobile industry. However, this competition was not contained within the mobile telecommunications industry, it had been cross-sector competition, i.e. wireless services from operators such as NTT Docomo, KDDI, J-Phone and Cellular were not only competing among themselves, but also competing with the fixed-line telephone service. In 1998 or 1999 the number of mobile subscribers had overtaken the number of fixed-line subscribers.

Today there are 80 million mobile subscribers and 60 million fixed-line subscribers in Japan. The fixed-line market is matured, which does not include the ADSL services market. If you are qualifying competition in the telecommunications market by the number of players in the industry, compared to ADSL, where there are a lot of players, there are fewer players in the mobile sector, and thus the competitive pressure in the mobile sector is not so high. However, there are other factors affecting the competitiveness in the mobile market, such as technological competition. If a company can introduce new technology, new services, and/or improve quality of the service, it can gain competitive advantage. There is competition between NTT Docomo, KDDI and J-Phone. J-Phone started an innovative *sha*-mail service a few years ago, which created a competitive lead for J-Phone and changed the competitive landscape in the mobile industry. Although there is competition through technology in the 2G mobile services market, the next major horizon of competition is 3G mobile service. KDDI au has launched their 3G service CDMA 2000 and NTT Docomo has launched FOMA, and the rivalry is quite strong.

The government is providing financial assistance from the national budget for fundamental research in the mobile telecommunications industry. However, there are strict rules on funded research; only fundamental research is eligible for funding. There is no government funding for research on applications in the mobile telecommunications industry.

The government supports competition through determining the technical standards. We have our ex-vice minister as the head of ITU right now, and we try to get the most advantage from his position. It is a technological strategy, and our ministry is part of it. There are many stakeholders in this strategy, e.g. METI and the Ministry of Education, it is a corporate effort to serve the strategy. There is competition for technology standards, particularly competition for becoming the de facto standard. For example, Cisco's technology and their ubiquity have set the de facto standard for their industry. The nature of competition has changed, and it is very complicated and dynamic. Because of this we can't directly assist and help one company's R&D. We need to care about what is going on in the market. There is no protectionism from the government, because there is a natural geographical boundary for the mobile carriers in the telecommunications industry.

I think J-Phone was doing quite well in terms of competition in the mobile services market in Japan. In terms of frequency being allocated by MPHPT, J-Phone has 1.5GHz band while NTT Docomo and KDDI au have 800MHz band. Historically, there is some technology advantage of 800MHz band over 1.5GHz for voice transmission, also the 800MHz technology had advantages over 1.5GHz in the service transparency and higher availability and performance in high density building areas, such as most cities in Japan. So, from the beginning, J-Phone had some disadvantages. However, J-Phone overcame this temporary technological disadvantage by introducing innovative value-added services such as the *sha*-mail service, this pioneering photo transmission service, complemented by their successful promotional campaign, attracted significant number of new customers and helped retained existing

customers. This forced other mobile service operators to offer photo transmission service, and this service became a de facto application in Japan.

The most critical resource in the mobile telecommunications industry is radio frequency. MPHPT has a policy to find more frequency and to make it available to the mobile operators, this is a technology driven process. We are actively looking for new technology to slice up the new frequency band for the mobile operators. If the government can make more frequency available to the mobile service operators, they will have the capability to provide more bandwidth demanding services. The government is looking to technological development to achieve greater frequency availability.

In Japan, in terms of 3G, MPHPT allocates the frequency, which is different from Europe, where the government auctions the frequency. I think the auction system kills competition because only the companies which can afford the frequency can get into the business. I believe that the EU is trying to make inter-countries competition rather than intra-country competition.

The Telecommunications Business Bureau of the MPHPT, in particular the Radio Division and the Service Tariff Division, are the most influential government bureaus for the mobile telecommunications industry in Japan. The Telecommunications Business Bureau is responsible for the regulatory environment of the mobile service industry. This bureau, under the prime minister's instruction, is now restructuring this regulatory environment. It is the radio division's responsibility to find new technology for better utilization of scarce Radio Spectrum. Besides MPHPT, METI is also influential in the mobile service business, because it is in charge of the mobile handset industry.

In the past, the government exerted significant control over this industry. But now, this situation has changed, the government wants competition

and development in the industry, so that we can gain international competitive advantage.

There are at least three policies from the government that affect the relationship among the mobile service operators. They are interconnection charges, service tariffs and consumer protection.

Interconnection charges directly affect the profitability of each mobile operator. The interconnection charge has been deregulated in 2001. Prior to this deregulation, NTT Docomo was required to submit an interconnection tariff, which was not applicable to KDDI and Vodafone. Now, interconnection charge is based on business negotiations between carriers.

Before 1997, every charge needed to get tariff approval from MPHPT. There was one tariff for one carrier for both charges[10] and contract, based on a government instigated tariff calculation.

In 1997, the tariff was deregulated, except for mobile charges. In 2001, there was full deregulation of the tariff. There is no longer any need for mobile operators to file to the government to obtain approval; the operators need to merely notify the government about their changes in tariff. In 2003, there is no more regulation on tariff. There is no meeting for tariff anymore.

Consumer protection by the government is becoming more and more important and prominent. Now the mobile operators have seriously to consider the consumer's requirement. Now, because of the government consumer protection policy, the influence chain is from the consumer to the government then to the operators.

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[10] *In Japan, for the mobile telecom industry, charge is referring to payment such as charge for termination of service.*

From a technical perspective, Vodafone's entering into the mobile sector in Japan and becoming the only foreign owned mobile carrier did not really affect the relationship among the carriers. However, there might be some impact on the informal communication between J-Phone/Vodafone and the government. This is because we are not good at communicating in English. It could be a problem if Vodafone's VP could not speak Japanese. Sometimes, particularly, the senior government officials prefer not to have an interpreter in a conversation, it slows down the conversation and affects the tempo of the conversation. It is Vodafone's issue as it is their responsibility to maintain proper communication with the government. They could hire a Japanese president for their subsidiary in Japan. It took Vodafone many years, but finally, they did hire a Japanese ex-executive from NTT Docomo. In my opinion this move from Vodafone was late as they had suffered a decline of sales. Look at Toyota. When Toyota goes overseas, after two to three years, they would hire local people, such as Americans in American plants. If there is a Japanese president in a plant located in American, it is too distinctive. Toyota hires Americans who understand Toyota's philosophy. In my opinion this should be better for both the factory performance and the workers.

In terms of the government determining a dominant carrier position, for fixed-line business, the calculation is simple facility-based share, e.g. NTT East has more than 50% subscriber lines in one prefecture, then NTT East's facility for network in that prefecture will be designated as the dominant network. In mobile, there is no physical limit or boundary, because it is intangible. It is in the air, it works as far as the operator has the radio frequency band. Therefore, it is quite difficult for the government to determine what would be the dominant power in the mobile industry. We have introduced the concept of substantial market power (SMP) and related regulation in 2001, and the government, has now created free competition in the mobile industry.

The government has a special calculation method in Japan to determine SMP: Market Share multiplied (X) by the % of total sales. For example, if

NTT Docomo has 60% market share and earns JPY4 billion revenue out of the JPY10 billion in a market: 60% X (4/10) = 24% (does not have SMP). If the result is >25%, the operator will be designated as the dominant operator.

In the mobile industry, the existing dominant players are NTT Docomo and Okinawa Cellular (that is Tu-ka in Okinawa). Okinawa Cellular is doing very well in Okinawa. Because of their size, unfortunately, they have triggered their dominant player designation. This means that Okinawa Cellular has to submit interconnection tariff as also required by other dominant players such as NTT East and NTT West, which is the only requirement for a dominant play. Unlike the dominant fixed-line NTT East and NTT West operators, which need to get approval from the ministry on their interconnection charge, the dominant mobile carrier needs only to notify the government and disclose the tariff. Also the dominant mobile carrier needs to provide equal treatment to all carriers, which include fixed-line and mobile carriers.

This government regulation is not very strong, because, even if there is no such regulation, the dominant carrier will be conscious of the government's intention and provide equal treatment to other carriers. The exception is the NTT Group, that's why the government has the rule for NTT Group, including NTT East, NTT West and NTT Communications. For NTT Docomo, it is OK. NTT Docomo has 9 major subsidiaries in Japan, e.g. NTT Docomo Holding, NTT Docomo Central, NTT Docomo Kansai. There are government rules on inter-activities among the NTT Docomo subsidiaries. These rules are not as strong as the ones for NTT East, NTT West and NTT Communications; the government rules over NTT Docomo focus on treatment of consumer information and some financial arrangements.

The government considers NTT Docomo as nine companies when we apply the policy of dominant mobile operator. On an operational level, they are nine companies; they have to submit nine separate financial reports

and subscriber data to the ministry. The rationale is that they don't co-exist in one prefecture, for example, in Tokyo, only NTT Docomo Central is operational, and in Osaka, NTT Docomo Kansai is in charge of Osaka. So the calculation goes prefecture by prefecture, there are forty-seven prefectures in Japan. We do one calculation for each area. NTT Docomo is winning in all areas except Okinawa. Therefore, NTT Docomo Hakkaido is the dominant mobile operator in the Hakkaido area, and NTT Docomo Central is the dominant mobile operator in the Central area.

Recently, Softbank's president, Mr. Son, has made a comment in the media that he will not accept ex-bureaucrats for a hundred years. It is quite a comment. It is the social system in Japan and there is history for this social system. This *amakudari* system helps prevent bribery, especially in the later year of a bureaucrat's career. The system works pretty well when the economy is growing. After we accomplished the economic growth, the society itself has to change, but *amakudari* is one of the areas which didn't change.

Amakudari is kind of taboo, because if we discuss *amakudari*, we have to discuss our salary, which is a taboo subject. It is the company which pays the ex-bureaucrat, but there is also a consumer perception issue. For example, if a carrier employs an ex-bureaucrat, his/her salary comes from the phone charge paid by consumers. That's why the consumer might not like the practice of *amakudari*.

In the US, people can move from university, to FCC, and to a telecommunications carrier. But there is strict rule in place for this type of people movement in Japan. Ex-bureaucrats cannot freely decide which company to work for immediately after their retirement from the government. For the first two years, they can only work in the public sector, such as an institute, research center (with public sector characteristics), or non-profit organization (NPO). After these two years, they can join any company they desire. *Amakudari* happens after the first two years of retirement. For example, the KDDI chairman, who was the

former vice-minister of Ministry of Telecommunications, worked in Data Communication Institution and two other institutes for two years before he joined KDDI as the chairman.

Mr. Ushio came to his position because he was good. He did a good job when he was the director general, then he was promoted to the vice-ministry position. He got a good reputation in Nagatacho area, where everybody knew and thought highly of him. Then KDDI appointed him as their chairman, two years after he had finished his career at the top position in the ministry. He still had some influence in the industry and ministry.

Mr. Ushio is still working with KDDI and comes back to the ministry to maintain top level communication with our senior executives. I believe that he and the ministry have frequent communication. This sort of communication helps both the ministry and the company. It is beneficial for the ministry in managing the industry as well.

We know the government rule, i.e. there is something which KDDI and the ministry should not disclose to each another; as long as both parties observe the rule, there is no harm for communication. We have to avoid distorting the government rule as well. Communication between the government and a company is crucial when a company is handling political issues. And at the same time, we have to observe the government rules. We certainly want to avoid the situation where the operators do not observe the government's rules, and then the market will be distorted and the consumers will be harmed.

I think there are a couple of ex-bureaucrats who joined J-Phone via *amakudari*. If now Vodafone asks the government to introduce a couple of ex-bureaucrats to help them to re-organize their company, we will co-operate with Vodafone provided that there are ex-bureaucrat(s) willing to do so. It is a simple business negotiation.

The whole process of *amakudari* needs to be initiated by Vodafone. Vodafone is different from J-Phone in a sense, because Vodafone is a western listed company, and they are very conscious about their business strategies and actions because these will affect their stock price. Vodafone exhibits a shareholder-oriented management style. If Vodafone considers that there is shareholder's value in *amakudari*, they might initiate the process; otherwise, they won't request *amakudari*. For example, if Vodafone understands and appreciates the benefit of *amakudari*, in terms of information, connection and knowledge, they will participate in it.

I think Vodafone has its own channel incentive model. For example, when you go to Big Camera, you pay JPY10,000 for a NTT Docomo FOMA handset, the market price of the handset is JPY40,000, NTT Docomo pays JPY30,000 to the channel, but Vodafone doesn't like this type of incentive model. Vodafone wants to get a good handset at the cheapest possible price. One of the reasons for Vodafone's poor business result might be Vodafone's lack of concern regarding aesthetics of mobile handsets, they were only focused on the cost analysis. However, Japanese consumers do care about how their handset looks; it is a Japanese characteristic to be conscious of our appearance. I don't think it is a bad corporate strategy, but the young Japanese, which were the majority of the target market, rejected the cheap handsets, and therefore the market rejected this strategy. It is a business competition level miscalculation from Vodafone.

Fair Trade Commission (FTC) is a stakeholder in the mobile telecommunications industry, because it has regulatory power over the industry. I welcome the regained independence of FTC, which was under the MPHPT prior to this change. It didn't look good when the FTC had regulatory power but was under the umbrella of the MPHPT. An independent FTC is the way it is supposed to be. The boundary between FTC and the MPHPT might be unclear to the outsiders, but it is very clear within these government agencies. I don't expect many things will be changed, but there will be a fight for boundary. Mr. Takeshima is now the chairman of FTC, he is an ambitious person. He is determined to expand

FTC's role in communications, but his ambitions have not been realized so far.

FTC's mission is to foster competition. MPHPT's mission is not competition, it is to increase benefits to society; we consider competition is a tool to increase benefits to the majority of the Japanese people. This explains why market share number is not our focus. In contrast, FTC always checks the market share numbers. For example, there are four cement companies, if two of them express their intentions for a merger, which will affect the competition dynamics in the market. Then FTC will express an opinion on the competitive situation with regard to the merger.

In the case of telecommunications industry, the government re-structured NTT into NTT East and NTT West. Prior to this restructuring, the fixed-line market was monopolized by NTT, while the mass consumers or users were content, we did not interfere with this monopoly. However, MPHPT would express our opinion to NTT's management about management issues or provision of services, if we thought that it would enhance the benefits to society. Therefore, the principle ideas of FTC and the ministry are different.

MPHPT considers competition as a tool for policy enhancement. In other words, as the competitive situation changes, we can use the change as a vehicle to formulate policy to regulate the competition. Our policy is to enhance the competitive environment base on how the society is benefiting from the current competition situation. We consider effect from all levels of competition, whether it be under competition or over competition. However, FTC only focuses and acts on the situation where there is too little competition. FTC and MPHPT will view competition from different perspectives.

Narrative 5 – Mr. Mori

Telecommunications industry veteran, executive consultant

September 2004

There are at least four critical resources in the mobile telecommunications industry, they are (1) infrastructure, i.e. the network; (2) radio spectrum; (3) mobile telephone number, i.e. carrier designated number; and (4) the right to set the tariff.

Infrastructure. The connecting infrastructure between fixed-line network and mobile networks is a resource. It is not feasible for all mobile carriers to build a nationwide network; therefore the government asks mobile carriers to connect to NTT's backbone network. This is called interconnection. This infrastructure is a resource shared among carriers. The interconnection between the networks is now based on business negotiations between carriers. They simply have to notify the MPHPT about the interconnection charge.

It is a good policy and regulation from the government to open up the NTT network to be used by other carriers. When carriers request NTT to provide usage of its network, MPHPT will help to facilitate the interconnection. The use or interconnection with NTT nationwide network is guaranteed by the government. In the past, NTT may have been slow at providing access to their network. However, because of the law suit pursued by Softbank, the standard time for establishing interconnection or allowing carrier to use NTT's network is now only two months in Japan.

Radio spectrum. When a company obtained a license to become a mobile operator, it will obtain radio spectrum as well. The licensing and allocation of radio spectrum are all controlled by the government.

Mobile telephone number. In the mobile telecommunications industry, the mobile telephone numbers to be used by NTT Docomo, KDDI au and Vodafone are determined and allocated by MPHPT. Telephone numbers

are a strategic and essential resource, and if a carrier cannot get enough allocation of telephone numbers, it cannot become a successful business. Telephone numbers are a limited resource and are currently owned and fixed to the existing carriers. When the government introduces the mobile number portability (MNP) system in 2006, I believe that there will be intensified competition in the mobile industry. The consumers when changing mobile carriers will be able to take their existing number with them. No longer will the telephone numbers belong to any particular carrier and the competitive advantage that was available through bulk ownership of telephone numbers will be negated. This government initiative of unlocking the allocated limited resource of telephone numbers will allow significant change and have a large influence on the competitive situation in the Japanese mobile industry.

Right to set tariff. When NTT Docomo was first created to provide mobile telecommunications service it was part of NTT. When NTT Docomo was separated from NTT, it was quite small, and it needed to invest a huge amount of money into equipment. Back then, the potential for mobile telecommunications business was an unknown. No one could estimate the incoming calls or outgoing calls volume. Therefore, the ministry allowed NTT Docomo to determine and set the tariff. I am not sure whether this capability should be called a resource, but it was a vital role played by NTT Docomo without government control. When other companies started offering mobile telecommunications services, permission from the telecommunications ministry was required for setting pricing or change of pricing. Recently, the ministry has deregulated setting tariffs. Mobile carriers are now required to notify the ministry about the change of their tariff. NTT Docomo has this same freedom as other mobile carriers. On the contrary, NTT East and NTT West still need to get permission from the government for changing their fixed-line tariff. While other fixed-line carriers are only required to notify the ministry about the change of their tariff. The right to set tariffs is only a beginning to the mobile industry. Even though the freedom of setting tariff is given to the carriers, there are only

limited new pricing strategies. For example, there is a new pricing strategy, double fixed price (flat rate) for data transmission offered by KDDI au. However, there is no competition in the main stream mobile voice revenue.

In Japan, there is freedom to select technology and there are multiple technical solutions in the mobile telecommunications industry. However, there might be interoperability problems among the mobile carriers. For example, the use of different frequency modulation such as WCDMA and CDMA, may be an issue.

Because there is no commonly used technical standard, there is competition among the carriers to use their own technology to differentiate their services, for example improve speed of transmission. If there is technology standard, all carriers will be using the same technology, things might be simpler, but as a consequence services differentiation could be less, e.g. the transmission speed might be slower.

I think the absence of restriction from the government on technical standards helped the mobile industry. For mobile carriers, they have the freedom to use whatever technology they like, that's why they developed their own technologies and there is a revolution in the mobile telecommunications technology in Japan.

I believe that from the user's perspective, currently, there is no price competition in the mobile telecommunications service industry in Japan. It is still very expensive to use mobile phones in Japan; the voice service is expensive. In the mobile industry, there is no forcing situation to drive down prices. In contrast, in the ADSL market, Mr. Son from Softbank is creating new services and driving down prices.

The history of ADSL in Japan is that initially NTT set a high price for ADSL services. However, after the government opened up the ADSL market, and Mr. Son from Softbank joined the competition in the ADSL market, he set a very low price for the services. Therefore, NTT needing to defend itself from Mr. Son's commercial attack also decreased their ADSL services

prices. Now for JPY1,980 per month, you can have an ADSL service, and the ADSL price in Japan is among the lowest in the world.

The government has given the mobile telecommunications industry the freedom to set tariffs, thus there is an existing environment for competition. However, in Japan, the competition is related to the Japanese way of thinking, and the carriers have a common practice of 'looking at each another's face'. MPHPT and the mobile carriers don't say much to each an other for fear of causing tension, but instead simply exchange information. In Japan, we don't want to stand out in a crowd., Therefore there is not yet drastic price competition in the mobile market as what Mr. Son did in the ADSL market.

Now, the situation in Japan has changed, Vodafone is a bit different, it is a UK company, but they are not doing much that is different than the Japanese mobile carriers to become a leader. I can envisage that when Mr. Son joins the mobile telecommunications industry, there will be a drastic decline in price. I think one of the reasons why Vodafone and other carriers did not start a price war is that there are now more than 80 millions mobile users in Japan, and the government has licensed only three carriers, NTT Docomo, KDDI au and Vodafone, are sharing the market. Vodafone currently has 18% market share, which is nearly a 18 million user base in Japan. Compared to the market in UK, Vodafone's customer base in Japan is very significant, and Vodafone's Average Revenue Per User (ARPU) in Japan is double of what they get in the UK. Vodafone might be content with what they have got in Japan. I think Vodafone will not start a price war because it might adversely affect their financial performance. Apart from Vodafone, neither NTT Docomo nor KDDI au has started a price war, and because they are keeping an eye on each another competitors' moves, this does not encourage any drastic price competition.

There are different aspects of competition in Japan, they are (1) infrastructure, or network coverage; (2) connectivity; (3) capacity or speed; and (4) application.

Coverage. For the past ten years, the Japanese mobile carriers invested heavily to make mobile services available everywhere in Japan. Maybe it is not 100% coverage yet, but consumers can use mobile phones almost everywhere in Japan. This is due to competition in coverage. It is quite different in the US, the country is vast, and it is the US carriers' business thinking that they would not build network coverage unless they can make money in the geographical area. In Japan, NTT Docomo is very conscious of the consumers, when consumers complain to NTT Docomo about the unavailability of their service, they will act on it. Although mobile carriers can tap into the NTT fixed-line nationwide network for call routing, they have to build their own nationwide base stations and antennas to make their service available. Japan is a high density and highly mobile country, people move around a lot. Therefore carriers are competing through rapidly building nationwide coverage.

Connectivity. Carriers not only get the users connected within their own network, but also enable their users to connect to users from other networks. There are merits among each carrier to entice their customers to stay within their networks and encourage their friend and family to also join their network. To this end, mobile carriers provide value-added services that are esoteric to their mobile services that are not necessary able to use through connection to other networks. This is a kind of customer lock-in strategy. Mobile carriers are using the issue of connectivity as a tool for competition. Currently, the C-mail service from KDDI au, which is equivalent to SMS, is contained as a service within the KDDI au mobile customers, these C-mails cannot be sent across to mobile customer on NTT Docomo and Vodafone networks.

Speed. Since the government introduced the 3G licenses, carriers have been competing on the basis of being able to transmit packets quicker with

their technology than the other carriers. The government allows the licensed 3G operators to decide on what technology that they will use to provide 3G services. Radio frequency bandwidth, which is controlled by MPHPT, is a major enabler of high speed data services.

Application. Mobile services applications are directly related to the level and extent of connectivity. In the beginning voice was the only application and mobile users could only be connected to the telephone network. But now mobile users can get connected to the Internet. This is because carriers wanted additional revenue streams through offering new applications to the consumers, and Internet was seen as a new wave of services. Therefore, it led to competition in the network level connectivity. In the past, the mobile handset had a small monitor and supported a slow transmission speed. However, carriers such as NTT Docomo developed new applications through i-mode, and now users can get high speed connection to the Internet through a feature-rich mobile handset. These capabilities form a basis for the consumers to use various value-added services and applications from their mobile services provider. These value-added services are bandwidth hungry and the government controls the allocation of the spectrum required to facilitate these services. Competition is driving the connectivity of mobile service to grow, from within the telephone network, to the Internet, and now getting connected to the TV network. Various mobile services applications are enabled with the expanding connectivity.

However, it is disappointing that there is absence of price competition.

As MPHPT introduces MNP, there will be a new element in the competition environment. Carriers will be competing for consumers who are on their competitors' networks. Competition is going to be very fierce. Needless to mention that if Softbank joins the industry, the competition will be further intensified.

Maybe the government's change on restriction on foreign ownership in mobile carriers did have an impact on opening up the mobile industry. In

Japan, there is an un-written rule that foreign carriers not to be granted radio spectrum. Therefore, only NTT Docomo, KDDI au and J-Phone were given radio spectrum. Vodafone is legally eligible to acquire J-Phone, which is under the relaxed foreign ownership regulation. Therefore, when Vodafone applied, the government had no reason not to grant the permission. Today, only notification is required for such acquisition, and such notification will be accepted by the government automatically, except for acquisition of NTT.

There are policies behind each of the resources that I mentioned earlier. I think the Business Policy Division of the Telecommunications Business Bureau is the most influential government body for the mobile telecommunications industry. They use regulation, human relation and communication to influence the industry.

There is *amakudari* in all carriers. There are ways where *amakudari* could be initiated. The first one is initiated by the ministry's administration department, which means a request to a company to take up *amakudari* is made by the government. The second one is initiated by a company; a request is made to the ministry for *amakudari*. The latter one is the usual way of initiating an *amakudari*.

All positions for *amakudari* are pre-determined, for example a finance director will come from the Ministry of Finance; an IT director will come from MPHPT. The grading of the outgoing bureaucrat determines the position of an *amakudari* in the receiving company. Each *amakudari* cycle is 2 to 4 years, when the ex-bureaucrat leaves a company, he/she will receive an early retirement fee, that's why they keep moving on. The government will take care of 3 cycles of *amakudari*. One of the benefits of *amakudari* is that a company can have good relationship and good communication with the government, where informal information could be exchanged.

Narrative 6 – Mr. Fujino

Mobile carrier, senior executive

February 2005

In the mobile industry in Japan, there were multiple carriers. In the Tokyo metropolitan area, at the peak of the market, there were 7 carriers. Now we have only three carriers in the Tokyo areas. Because of competition, some carriers have gone and some remain in the industry. Although competition is difficult to define, I believe that the mobile industry is one of the most competitive industries in Japan.

Competition has caused the number of carriers to decrease. This is due in part to the requirement of wireless companies for radio spectrum to operate their businesses, and the spectrum is a limited resource. The Japanese government sees spectrum as a valuable and controllable resource.

In the US, spectrum is allocated by auction and spectrum is bought and sold in the open market. I don't think it is successful in the US. We are aware of this type of spectrum management but we do not use this type of model in Japan.

The Japanese government tries to work out how to best utilize the spectrum resource and so it is not a pure free competition environment. Therefore the mobile service industry in Japan is currently in a controlled competition environment. Ten years ago, this was not the case, the operators offered PHS service, which uses different spectrum from what the 3G mobile operators are using today. Back then, the spectrum was sufficient. However, now the mobile operators need more spectrum.

In general the Japanese market is competitive in terms of freedom to join and leave the market. However, this is not the case for the mobile service industry which offers service to the public. As an essential service to the public, the mobile industry needed to be controlled and monitored. The

public will be confused and adversely affected, if a mobile service operator can freely join the industry today and leave tomorrow.

I can explain by using a metaphor, how the mobile services business operates by liking it to businesses being of two tribes; one is a farming tribe and the other is a hunting tribe. The mobile services market is not a world for the hunting tribe. It is a world for the farming tribe. Because spectrum is a limited resource, and is allocated to the mobile carrier, it is comparable to being given a fixed size of farm land that you work on. But it does not mean that all conditions have been pre-determined, you have to be creative and do a lot of work to compete with others so that you can have a better yield. There are often factors affecting competition and how you can effectively and efficiently use the land to create or yield the product.

There are people saying that there is no competition in such controlled conditions. If you subscribe to the thought that competition breeds a successful industry, then the mobile service industry in Japan reflects this by being the most advanced one in the world. If you only focus on the result of competition, by definition, the Japan mobile industry is successful. I believe even though the mobile service industry is in a controlled environment, there is competition among the carriers, which leads to the successful results.

As a result of competition in the last ten years, the tariff level for mobile services went down and technology evolution and advancement occurred. It is very often said that in Japan, mobile services tariffs are still high compared to worldwide standards. But when you compare the cost of mobile services to other expenses level in Japan, I don't think the tariff is particularly high. For example, it is expensive to rent space to put a base station in Japan. A roof top rental for a base station in Roppongi might cost several hundreds of thousands Yen per month. If you take all the factors into consideration, the cost and payment involved is well balanced.

The legislation in 1994 allowed consumers to purchase their own handset, and since then the mobile penetration rate in Japan has shown exponential growth. During the past ten years, the number of mobile operators has reduced from seven to three. It was known that Japan was behind other countries in terms of Japanese companies exporting mobile handsets, so the Telecommunications Ministry wanted to expand the handset market overseas through deregulating the Japanese mobile handset sales.

It is my feeling that currently, the competition is more fierce and intensive then 10 years ago as the mobile services market is getting saturated.

One of the reasons for the mobile handset business growth is that when considering the transition from 1G to 2G system, the customer needed a new handset. The earlier system was an analogue system and the market was monopolized by NTT.

The Japan government was faced with deregulating mobile handsets. Then the 2nd generation handset market was liberated at a time when new carriers /operators came into the market and commercial service offered on 2G network was about to be ready. Another option was to make all handsets free from spectrum. It was hard to judge which is better.

The Japanese government was faced with the decision of whether to deregulate mobile handsets. Deregulation of mobile handset means that mobile service users can purchase and own their mobile handset. If 1G analogue mobile customers had purchased their own analogue handsets, they would like to use their handsets as long as they could. It was believed that if this is the case, it would be hard for the customers to migrate to the 2G service. Therefore, both the government and the mobile carriers were hesitant to open up the sale of handsets market. However, after deliberation, we agreed that all handsets can to be owned by customers.

When we think about it now, the 1G handset issue was not going to be a big deal, as the market expansion for 2G is overwhelming. The 2G

handset is much better, smaller, battery life is longer and lighter. Therefore, customers would naturally migrate to 2G services. If the 2G handset technology had not been so advanced (i.e. 2G handset is smaller than 1G handset), the 1G handset ownership issue might have been problematic.

In 1994, a new handset was very expensive, it cost JPY 100,000. Some people thought that they are better off to have the carrier pay the cost of the handset and they pay the few thousand Yen per month for services. But eventually the handset cost went down significantly.

In my view, the migration from 2.5G to 3G is not slow compared to other countries. But, the current migration is more challenging then the migration 10 years ago, because it is more difficult to reduce tariffs now than in the past. When the migration to 2G was happening, the market was in an expansion stage. In addition, we had room to lower the prices and latitude from the government to reduce tariff. In terms of tariffs, 1G was high and 2G was getting cheaper, therefore there was a natural migration of customers from 1G to 2G mobile services.

In order to accelerate the migration from 2.5G to 3G, what we can do is to offer specific services which are only available on 3G. For example, services based on high speed data transmission such as image-telephony, TV and value-added content.

I see the need to migrate from 2G to 3G is very strong in Japan. When you look at the technology cycle, 3G is more cost efficient than 2G. That means there is room for equipment cost reduction and therefore mobile companies will spend money on R&D. There is technical challenge in 3G technology R&D; however, if the 3G is successful, we would be able to see cost reduction.

In the end the migration to 3G will be complete. During the 1G to 2G migration, the 1G customer base was small, but not now in the 2G to 3G migration, where the existing 2G customer base is big. If there is a total

migration from 2G to 3G within one year then mobile carriers would need to double their capacity. This is not possible so we need to control the speed of migration.

In the European market, the migration situation is easier than the one in Japan. They are having 2G services on the GSM network. They can add 3G service on to their existing network, bit by bit. And they have dual mode handset to support this. Therefore, it is possible for the European market to expand their capacity gradually.

In Japan, we are using PDC for 2G which is unique and completely different from 3G network. That means Japan mobile carriers need to have dual networks. And the Japan mobile carriers are not able to build new networks immediately. We have a challenge in Japan to handle the handicap between 2G and 3G mobile services.

Telecommunications Business Law in Japan was effective two to four years ago. Since then there is competition in the fixed line business. I don't think that there is any legislation or regulation in particular to open up the mobile industry.

I think the Japanese government is using the same approach in the mobile market that means they (government) first deregulate the fixed line market, to allow new entrants to join the market. Then the government applies the same approach in the mobile market.

The Japanese government gave away the 3G license to only NTT Docomo, KDDI au and J-Phone. By doing this they (the government) did control competition. The spectrum allocated to each of the three mobile carriers here is wider than those obtained by overseas carriers. That means carriers in Japan can offer higher speed services with better quality.

I think a monopoly in the mobile industry is not good. Because in a monopoly there is no competition and efficiency is not good. As there are more carriers, efficiency will be improved, but there should be optimum

point. However, it is hard to judge, the right number of mobile carriers and the spectrum break-up. As there are larger numbers of mobile carriers, the spectrum would need to be divided into smaller portions and there will be bandwidth wastage between the allocated frequency bands.

I don't think the relationship among the carriers has changed since the government legislation allowing foreign companies, such as Vodafone, to join the mobile industry.

But, when I look back the communication between the carriers has significantly reduced, since the government introduced anti-collusion and anti-monopoly legislations.

The communication between carriers in the past was informal, there was no specific rule for communicating, carriers came together to discuss the best way of doing things. We had no choice but to discuss issues which mutually affected each another. But with more anti-monopoly rules introduced by the government and fear of violating such rules, there is less and less communication between the carriers. Before the the introduction of such regulation, for example carriers didn't hesitate to come together to discuss how to deal with changing from 10-digit to 11-digit of dialing number. Such opportunities are fewer now.

I think less communication between/among the carriers is a disadvantage to the industry. There is now an association of electronic communication membership which is open for the carriers to join. In this telecommunications association, all fixed and mobile operators are eligible to become members. In this association there is a forum to discuss mobile specific problems and issues. But we need to be members of the committee or association to join the discussion.

There is some cooperation among the carriers, e.g. technology cooperation, however as outlined, the situation is very different now. We try to cooperate, for example the mobile number portability which is likely to be launched next year, which will require carriers to cooperate to make

this happen successfully. But on the other hand, we need to be careful about anti-monopoly law.

I think we need to be more open to cooperation than worry about the anti-monopoly law or anti-collusion law. At the end of the day, each carrier is connected to each another. Therefore, carriers need to connect to each another and cooperate to each another to make it work and provide quality service to the customers.

In terms of deregulation, the steps taken by MPHPT in 1994 in mobile handset ownership is important. Also, instead of the requirement of obtaining permission from the MPHPT to change tariffs, carriers are now required to file notification, in advance, to MPHPT. It is a good government initiative. It would be good if the government had introduced this regulation earlier in Japan which was done overseas many years ago. This sort of regulation does help carriers to grow.

For the fixed line business there is asymmetric legislation. In the mobile industry there are dominant carriers and there is no asymmetric legislation. This means that in a local area, if you have more than 30% of the market share, you will be deemed as a dominant carrier, and there will be government checking on you. This is not asymmetric, but it ends up that NTT Docomo is the dominant player, except for Okinawa Cellar. Okinawa Cellar is doing very well in Okinawa and they have more than 30% market share, but they have applied to the government for exemption from being a dominant carrier in Okinawa.

NTT Docomo has not received preferential treatment from the government owned NTT, in the interconnection regime. There was instruction from the government asking NTT and NTT Docomo to deal with other carriers fairly in terms of arranging interconnect, NTT and NTT Docomo followed such instruction.

MPHPT is ineffective in promoting industry level performance. In real terms MPHPT doesn't hurt, but they could have done things earlier than

they did. I think MPHPT delayed some of the legislation (de-regulation) intentionally. If things are done according to the carriers wish, there is not much value of the existence of the MPHPT. The Ministry's value for existence is manifested in their delayed realization of the carrier's requests. We (carriers) need to keep asking the Ministry to drive the deregulation faster.

It is difficult for the MPHPT to have an overall strategy direction for the mobile industry, because many people in the MPHPT are rotated / moved. This situation is common in the Japanese government and the carriers. In MPHPT people are rotated very often and people would stay in the mobile sector of the MPHPT for around 2 years. Senior people in MPHPT if they are high flyers, very likely, they will move within 2 years. Also in the carriers' people are moved a lot.

Competition is a difficult situation to consider. In general, the majority of people say that in terms of the competition environment, the more intensive/severe it is, the better it is. My assumption is that in the mobile business it is different; you need to invest a lot of money in infrastructure to become a viable mobile services provider. There are 3 carriers now. If there is a 4th and/or 5th entrant, they will think that they are going to be the winner. They would forecast higher market share than the one they will get. For example, 100% capacity is the most desirable and they might over-build capacity. The more carriers, the situation might be worse. And more capacity might be over-built. If the government intervened and increased the number of carriers the situation might be worse.

The situation we are currently in is low government involvement and medium-high competition. There is competition in the industry, but in the public perspective, there are few players and the industry is not very competitive. I believe the level of competition is going up. Because Softbank and other new entrants are looking to dominate the market.

If the assumption is that there is small investment to be made by each player, and then you might think the more players, the more serious the

competition is. When you come to the mobile business, which requires large initial investment and as we are moving from 2G to 3G service, carriers need to keep investing. The market will keep vitalizing itself. If there are too many carriers spending too much money, then there will be inefficiency. Competition might not be worthwhile in this situation.

Chapter Seven – Data Analysis

'Out of intense complexities intense simplicities emerge.'
– Winston Churchill

1. Introduction

My research question is 'to what extent is the Japanese government able to steer the nation's economy in the digital age?" The research focus is on the industrial development related to the mobile telecommunications sector. The theoretical orientation of this research uses the resource base perspective (Pfeffer & Salancik 1978) together with that of the interorganizational network (ION) approach (Benson 1975, p. 961). According to resource dependence theory, a resource is an element which is essential to a firm's survival; firms are dependent upon other firms in the resource dependence environment, and desire to ameliorate overdependence on other firms, and at the same time attempt to maximize other firms' dependence upon them (Greenwood 2008). There are two tiers of ION relationship in the resource environment (Benson 1975); one of the tiers is the interorganizational network among firms in an industry, which is comprised of the firms with business relationships such as competitors, partners, collaborators and suppliers; the other tier is the relationship between the firms in the industry and the actors in the industry's resource environment, such as the governing regulatory organization. In the current research, I focus on the essential resources for the mobile telecommunications industry; the dependency relationship within the two tiers of ION relationships in the mobile telecommunications industry, and the strategic actions taken by stakeholders in this ION to manage the resource dependency.

During my data collection in the Japanese mobile industry through interviews with industry stakeholders, I have identified several resources in the ION of the Japanese mobile telecommunications industry, and I have focused on the following three critical resources: *(1) amakudari, (2)*

technological standard; and *(3) frequency spectrum.* I have no intention of claiming that these three resources formed an exhaustive list of resources for the industry; rather they are distinctive and critical resources which emerged as such through the processes of my research.

In this chapter, I am going to elucidate, based on the narratives resulting from my primary research and in the light of the existing literature, first, why these are critical resources for the mobile carrier's survival, which fits the resource dependence analytical framework (Greenwood 2008); second, what the role of these resources is in the ION of the mobile telecommunications industry and third, how the Japanese government is involved in mobilizing these resources in the industry in order to achieve their objectives, which involve interaction between the bureaucrats and the mobile telecommunications carriers in terms of negotiation over the resources.

The chief relation involved in the interaction between bureaucrats and mobile telecommunications carriers is expressed in the concept of *amakudari*: this is the Japanese traditional practice of placing retired bureaucrats in private sectors. The term represents both a specific practice and the name given to those people who fill a specific role, such as ex-bureaucrats, who play an important role in industry development. Technology standards are a critical component and resource in the mobile telecommunications industry; they enable interoperability of equipment used in the mobile industry. Technology standards implemented at a global level have important implications for the competitiveness of any standards adopted by a particular mobile carrier.

Technology standards in the mobile telecommunications industry operate within a realm that is highly regulated by government. Radio frequency spectrum is a resource which belongs to government. Technically, any person or firm can use radio frequency spectrum; however, without a license, a right or an exemption granted by the government, the usage of radio frequency spectrum is illegal. Technology standards and frequency

spectrum are inter-twined resources, because frequency spectrum, allocated by the government, affects the choice of technology standard by a mobile telecommunications carrier. Government needs to be conscious of and needs to make available the frequency spectrum for the mobile telecommunications industry according to the economic viability and availability of technology standards.

These focal resources have attracted uneven interests from scholars in various disciplines. *Amakudari* attracts interests from studies of industry structure, Japanese studies, and political economy. Technology standards draw attention in areas such as the economics of network externalities, adoption of technology standards, and technology lock-in. The issues of frequency spectrum have attracted research and discussion of aspects such as spectrum allocation mechanisms, government's role in spectrum allocation, economics of spectrum allocation, and market structure and cost structure of the mobile telecommunications industry.

One result of the differing coverage and depth of these existing literatures on the three resources is that the thesis has to draw on data analyses from different academic disciplines and dimensions. In my research I have consolidated these diverse aspects and framed the analysis within the resource dependence perspective, in order to provide a holistic view of how the government steers the industry through its influence over critical resources and how ION is effected.

2. *Data analysis on amakudari*

In this section, I am going to discuss, in the light of the existing literature, why *amakudari* is identified as a critical resource, what is the role of *amakudari* in the industry, and how the Japanese government is involved in mobilizing *amakudari* in the industry in order to achieve its objectives.

While the phenomenon of *amakudari* is widely studied, there is no uniform definition of what it means (Grimes 2005). *Amakudari* is a Japanese phrase; its literal translation into English is "descent from heaven". The

term *amakudari* is used interchangeably as the process of, and also the collective name for, the group of ex-bureaucrats re-employed after their retirement from the government. *Amakudari* represents a practice, understanding and descriptive feature of the Japanese method of deploying retired bureaucrats in the private sector. In *The Reemployment of Retired Government Bureaucrats in Japanese Big Business*, Johnson (1974) pioneered a scholarly study on the phenomenon of amakudari. He explored the origin, practice and benefits of *amakudari.* In *Informal and Monetary Policy in Japan,* van Rixtel (2002) performed a thorough survey on a spectrum of scholarly works related to *amakudari* and presented a summary of how scholars differently defined the term. van Rixtel (2002) indicated that different definitions lead to different scopes and dimensions of research, and subsequently, different conclusions and theories. The dimensions of differences, in terms of definition and understanding of *amakudari*, include the motivation for *amakudari*, the nature and size of organizations that receive retired bureaucrats, the career path of the retired bureaucrats, and the benefits to and from the practice of *amakudari.*

My research focus is on the practice of *amakudari* used by the government and the organizations in the mobile industry, and is not concerned with the origination, the people or the process that make *amakudari* happen. The understanding of *amakudari* which I use in my analysis is that *amakudari* involves acceptance of ex-bureaucrats from the telecommunications ministry by mobile telecommunications corporations in Japan, and is used as a resource.

2.1 Literature review on amakudari

The phenomenon of *amakudari* has attracted attention from scholars from different disciplines. Johnson (1974), a political scientist, explored the reasons for government to push retired ex-bureaucrats into the private sector for reemployment. Calder (1989), a political scientist, studied and concluded that *amakudari* is driven by the smaller and weaker firms in the

market, and theorized the "pull" dynamic and the "equalization theory". van Rixtel (2002), an economist, researched the economic effect *amakudari* had on the banking industry in Japan. Japanese studies scholar Nakano (1998) explored the phenomenon of *amakudari* in the telecommunications ministry. Colignon and Usui (2001) theorized that there existed an "iron triangle" based power structure among Japanese politicians, bureaucrats and the private business sector. Schaede (1995) articulated the role and importance of "old boy" networks in the social relations of Japanese business, politics and bureaucracy.

2.1.1 Johnson's push" theory

Johnson (1974) identified *amakudari* as an institution establishing a resource based relationship between government and enterprise organizations. Johnson claimed that the phenomenon of *amakudari* was derived 'from a combination of the necessity of finding employment after retirement, the guarantee of career employment after initial acceptance, strict seniority by university graduating class, the predominance of Tokyo University graduates in all ministries, and the pressure of junior grades moving up the seniority ladder' (Johnson 1974, p. 961). Johnson identified government using *amakudari* as a positive policy to enhance the effectiveness of administrative guidance. Johnson (1974) stated that in the 1950s many business organizations desired and welcomed *amakudari*, because they saw *amakudari* as a vehicle for privileged access to government agencies responsible for investment funds and licenses. He collected evidence which showed that *amakudari* was a direct conduit between the government and the receiving organization; for instance, major steel companies had real time access to MITI decisions.

Based on Johnson's views, and in the light of resource dependence theory, *amakudari can* be considered, as a resource to the business organization, and a vehicle for accessing critical resources. Through ex-bureaucrats working in business organizations these organizations are able to gain access other essential resources for their operation. Johnson

(1974) claimed that *amakudari* exists via a push dynamic which is consistent with Nakano's view. However, Nakano (1988) illuminated a different perspective on what drives the push dynamic in *amakudari*.

2.1.2 Nakano's "spoil" for regulatory ministry

In *Becoming a Policy Ministry: The Organization and Amakudari of the Ministry of Posts and Telecommunications,* Nakano (1998) has suggested that '*amakudari* is a product of, rather than a means to, bureaucratic control over firms and that it works as "spoils" for the regulatory ministry' (p. 97), i.e. *amakudari* is a reward for the regulatory ministry.

Nakano (1998) agreed with Johnson's (1974) view of *amakudari* being a "push" phenomenon. However, Nakano stressed the reward basis rather than, as articulated by Johnson, the need for ex-bureaucrats' to be re-employed after their retirement. Nakano expanded on Johnson's "push" argument, stressing the need for administrative guidance due to lack of transparency of regulation and the contingent issues with situational regulation, making corporate behavior hard to police. He espoused that reward or "spoil" is the driving force for the *amakudari* phenomenon.

Nakano empathized with Calder's (1989) view of a "pull" dynamic initiated by the corporate world to explain *amakudari*. *Amakudari* ensures access to policy information, provides lobbying influence in the regulatory process and facilitates administration guidance. Again, Nakano stresses the "spoil" aspect as the driving force for corporations to engagement in *amakudari*.

Nakano (1998) took a further step than Schaede (1995) and Johnson (1974), and suggested that *amakudari* is the product of bureaucratic regulatory power much more than a means to it. In the case of MPT, '*amakudari* works as "spoils", a sort of dues firms have to pay to MPT, in recognition of the jurisdictional power position of the MPT' (Nakano 1998, p. 113). Nakano agreed with Schaede's (1995) model of "management of regulation" which combines the government-"push" and the firms "pull" duality. Nakano stated that Calder's (1989) "equalization" theory is not

supported by evidence from the telecommunications sector. However, he did agree with Calder's underlining argument that firms hire former officials to reduce the uncertainty of regulatory outcomes.

2.1.3 Calder's "pull' and "equalization" theory

In essence, Calder's (1989) argument is that *amakudari* is used by weaker firms to gain power and manipulate and induce predictability in their political environment. Corruption is a time-honored tool of those with weak political ties throughout the world. Smaller and weaker organizations have striven harder then their counterparts to influence the process of resource allocation by political means.

Calder stressed *amakudari* as a basic Japanese political phenomenon and understood it as aiding firms in manipulating their external environment. For example, the inflow of ex-bureaucrats to private firms increased, as inter-corporate rivalry intensified in the 1950s. Ex-bureaucrats play a significant role in representing the interest of various small firms and *amakudari* served as a valuable way of gaining an entrée with government that would otherwise be lacking. Calder explained how IBM used *amakudari* as an "equalization" device for improving its relationships with and access to information from the Japanese government. In the case of the telecommunications industry, Calder positioned *amakudari* as being used to garner government contracts for the retired bureaucrats' new employers.

Calder explained that the paramount function of most former government officials is providing information to their adopted organizations. In some cases, the primary role of former officials in their adopted firms is providing specific managerial expertise and broadening access to the decision-making process for groups which would otherwise lack such entrée. Calder stated that "push" as well as "pull" dynamics occur to a weaker firm in the *amakudari* phenomenon. "Equalization" functions appear to occur in areas of information gathering and making introductions on behalf of their firms. *Amakudari* plays an active role in ensuring that government

decisions are favorable to their firms in the areas such as licensing, investment guarantees and government contracts.

2.1.4 Colignon and Usui's "iron triangle"

Colignon and Usui's (2001) central argument is that Japanese politicians, bureaucrats and the private sector are bound in a cohesive and cooperative "iron triangle" association, which provides a power structure. In Japan, there is an understanding that inter-institutional cooperation produces the best outcomes, created by fusing linkages among politicians, bureaucrats and the private sector through formal and informal relationships.

In Colignon and Usui's (2001) work , several elements of *amakudari* networks were researched: they suggested that *amakudari* had a structural and resilient character for the Japanese political economy. They contended that *amakudari* provides an important mechanism of informal inter-institutional networks of cooperation through this "iron triangle". These informal networks are viewed as conduits of information and negotiation among politicians, bureaucrats and business people. These networks provide the structural substance of a power structure or "iron triangle", based on the relations among bureaucrats, political and business elites. Their analysis is consistent with Karel van Wolferen's (1989) view of the structural association of bureaucratic, political and business elites in an "iron triangle" and *amakudari's* role as ensuring smooth communication and 'the flow of information between bureaucracy and enterprises' (p.45).

Colignon and Usui's view is that *amakudari* provide one of the key ingredients in the glue of the "Japan, Inc." model. The Japan Inc model is a notion that power in Japan is concentrated in the hands of these three major groups: politicians, government and big business. Colignon and Usui highlighted the economic dependence of the private and public sectors, by providing evidence which supports the hypothesis that the resilience of *amakudari* represents elite cohesion, institutional integration and the strength of power structure. They claimed that the role of

amakudari in this institutional relationship is based on an understanding that an inherent part of the society constantly interacting with other forces in that society constitutes institutional cooperation. The private sector is dependent on the bureaucracy in areas such as licensing, regulation and policy information. Colignon and Usui conducted a survey on the pattern of *amakudari* and obtained empirical evidence to substantiate the presence of *amakudari* as an embedded mechanism of elite influence in Japanese society. Evidence of the dependency is based holistically on the networks of distribution of *amakudari*.

2.1.5 Schaede's "old boy" network

The nub of Schaede's (1995) argument is that retired government officials descend from heaven, *amakudari*, into the boardrooms of private corporations in a model of "management of regulation", one which explains the rationale for bureaucrats and private sector to interact in processes of formulating public and corporate strategies. Employment after retirement is a "second life" for the ex-bureaucrats and this "second life", as an old boy, draws heavily from their experience and personal relationships from their "first life" as bureaucrats. Schaede described *amakudari* as an institutional mechanism of re-employment. She espoused that the old boy phenomenon is an indicator of tight government-business relationships used as a primary tool, which serves as a proof of the complete economic guidance by the Japanese bureaucracy. She further explained how firms facing an external constraint that (1) influenced their competitive position within the industry and (2) who are controlled by the regulators have the strongest need for old boys. She stressed that *amakudari* is a managed process and functions under the administrative control of the National Personnel Authority of the government. Schaede stated that bureaucrats' post-retirement employment is arranged by the National Personnel Authority, normally as a two year placement, where the old boys earn a retirement stipend with each placement. Thus the old boy's lifetime income is dependent upon the National Personnel Authority, this mechanism

contributes a strong incentive for the old boys to act in the interest of the former employer, the administration.

Schaede proposed that a model of the "management of (non-transparent) regulation" offers a powerful explanation for the phenomenon of the *amakudari* old boys; this model is applicable to both government and business organizations. Her view on resource dependence theory is that (1), organizations depend on outside groups that control important inputs and/or resources, that is they are interdependent with the outside elements, with which they transact; and (2) organizations will develop strategies to manage their external constraints to make them less burdensome. She claimed that according to resource dependence theory, from a firm's perspective, regulation could be regarded as an external constraint on their business activities. Where there is more regulation in the business environment, a firm will spend more effort on managing the regulators, in terms of influencing the regulatory decision-making process, which is consistent with Pfeffer and Salancik's (1978) theory of firms' strategies for managing external constraints. From the government's perspective, they require a system to ensure compliance of the regulation. Thus old boys act as an intermediary (1) for the business organization to lobby for favorable regulation; and (2) for the regulator to monitor the existing regulation. Thus, Schaede contended that the primary strategy behind hiring a retired government official is to ensure direct access to information and to incumbent bureaucrats under intra-industry competition for limited resources.

Schaede explained that administrative guidance is not transparent and often involves delicate conversations between ministry officials and management representatives. According to Schaede, informal industry claims are that this form of regulatory practice constitutes an estimate up to 60-90 per cent of all the regulation of a given industry. She espoused that hiring of old boys is required for situational guidance in the Japanese regulatory framework for two reasons (1) strong need for direct access to

government information and for influencing regulatory decision making and (2) differences across industries.

Schaede distilled the *amakudari* argument into the "management of regulation" hypothesis in terms of processes that suggest that firms will be more likely to hire old boys from relevant ministries than government agencies that have little or no regulatory relevance to them. Such a hypothesis is consistent with the resource-dependence perspective, suggesting that old boys are a mechanism for dealing with external dependencies arising from regulatory uncertainly. Specific industry laws, tend to align primary lobbying needs around protection, and other industry-wide matters. The "management of regulation" model supports the notion of Japanese "consultative capitalism", in that it shows why government and business interact in the process of public and corporate strategy formulation. Schaede refuted the "equalization argument", based on her findings that old boys are as likely to join large firms as small firms.

The old boy phenomenon is pronounced in Japan due to the need for highly effective communication and information flows to manage the uncertainty of situational regulation through administrative guidance. *Amakudari* is a mechanism to reinforce the connection and communication between private and public enterprise. It facilitates a smooth flow of information to and from the ministry and mitigates uncertainty.

Schaede suggested that enforcement of decisions in the situation of high situational regulation and non-transparent administrative guidance is based on a carrot-and-stick principle between the government and enterprise. In this environment, *amakudari* is a vehicle with which to ameliorate uncertainty. Corporations embrace *amakudari* for several reasons: (1) to ensure access to information in an environment of non-transparency; (2) to ensure intermediation in times of clashes of interest with the government; and (3) to lobby under the framework of encompassing regulation, and thereby manage the dependency on the regulator in an environment of administrative guidance. The rewards to be

reaped from complying with administrative guidance may be instrumental for gaining an edge in intra-industry competition.

Schaede concluded that there are three specific functions performed by old boys in the Japanese environment, they are that (1) the old boys facilitate information flow between government and the private sector; (2) old boys influence the formulation of corporate strategies because the old boys carry an understanding of the regulating ministry into the boardroom; and (3) the old boys influence the formulation of public policies because the old boys of *amakudari* understand how to represent the firms' interest in the process of formulating administrative guidance. In the context of her research, she drew three implications from this, (1) the characteristic of non-transparent regulation in Japan leads to the old boys phenomenon; (2) old boys' networks form an institutionalized system for "lubricating" government-business relationships; and (3) there is an institutional embeddedness of corporate strategies in Japanese multinationals companies.

2.1.6 Summary of literature review

Calder's (1989) and Schaede's (1995) *amakudari* theories are both based on resource dependence theory. However, they differ in their view on the actual pattern of *amakudari*. In my view, *amakudari* has several driving forces, and therefore cannot be comprehensively explained using a single dimensional perspective, such as Johnson's (1974) "push", Calder's (1989) "pull", Schaede's (1995) "management of regulation" or as a reward or "spoil" as articulated by Nakano (1998). *Amakudari* is rooted in the Japanese practices of "invisible forces" of respect and harmony and I support a balanced push-pull harmonizing effect which has significant benefit to the government, firms and the telecommunications industry. It is not my intent or purpose to articulate the varying elements and theories on how and why *amakudari* happens or the tension, cohesion and/or conflict which arises within and between these theories. In essence my focus is on the dynamics and result of *amakudari* as applied to the ION and resource

dependence theory in the telecommunications mobile industry in Japan and not on the origination or the process of the *amakudari* phenomenon, i.e. how retired bureaucrats are placed in the private sectors for post-retirement employment. However, the resource-dependence theme which emanates from these theories on *amakudari* is of particular interest. *Amakudari* is a resource dependence phenomenon, which facilitates government involvement in the telecommunications industry.

The literature highlights that both the private sector and the government benefit from the phenomenon of *amakudari* and that where the benefits are crucial to business survival, *amakudari* can be treated as a resource to both the private sector and the government. It is apparent that the private sector benefits from gaining privileged access to government agencies, which are responsible for allocation of resources in the respective industry (Calder 1989; Johnson 1974; Nakano 1998; Schaede 1995); ensuring access to policy information and lobbying influence in the regulatory process (Nakano 1998), and reducing the uncertainly of regulatory outcomes through inducing predictability in their political environment (Calder 1989; Nakano 1998; Schaede 1995).

The government benefits from *amakudari* in terms of enhancing the effectiveness of implementation of administrative guidance (Johnson 1974), gaining means to monitor and to ensure the compliance of administrative guidance (Nakano 1998; Schaede 1995), and ensuring the availability of a smooth flow of information to and from the government that mitigates uncertainty (Schaede 1995). For both government and the private sector, *amakudari* enables tight relationship between government and business (Colignon & Usui 2001; Schaede 1995) and provides an important mechanism of informal inter-institutional network of cooperation. Such networks are a critical conduit for information exchange and negotiation among politicians, bureaucrats and business people (Colignon & Usui 2001), and influence decision-making in both government and corporate arenas (Schaede 1995).

2.2 *Discovery in this research*

My research journey involved viewing *amakudari* from various dimensions, examining it through the lens of interdisciplinary knowledge and understanding. It became evident to me that *amakudari* is not only a resource but also a source of power that is instrumental in the execution of government involvement in the mobile industry in Japan. I use the term source as 'a generative force' (Merriam-Webster Dictionary), in the sense of a positive power, and the term resource as 'an available means' (Merriam-Webster Dictionary). There is a circuit of resources which permeates the fabric of the mobile industry and provides formal and informal connections between the Japanese government and enterprises in this industry. I use the term circuit as 'a route or movement', Latin *circuitus*, from *circumire* 'go round' (Oxford Dictionary). *Amakudari* is a resource and a source of power, which provides energy to the circuit of resources.

Power is the ability to make others to do something which they will not do otherwise (Hardy & Clegg 1996). According to Clegg's (1989) theory of power, the root of power is the ability to stabilize the control of resources, thus in the resource dependency of the involved parties, this resource dependency is both the cause and consequence of power. Power exists as there is a relational relationship between parties involved. Depending on the circumstances, resources could be anything, such as money, authority, information or the capability to innovate. Due to the power/knowledge nature of agency, episodic power will attract resistance. Resistance does not necessarily manifest itself in terms of conflict; for instance, not supporting a goal could be a reflection of resistance. Power is not static, as illustrated in Clegg's (1989) 'circuits of power'; power may route through circuits constituted by rules, relations and resources. In the Japanese mobile telecommunications industry *amakudari* is a resource which is critical for a mobile carriers' survival in Japan. In the light of the existing literature, I examine the reality of *amakudari* in the Japanese

mobile telecommunications industry, through analyzing narratives from my fieldwork.

2.2.1 Existence of amakudari as a resource

Nakano (1998) surveyed the phenomenon of *amakudari* in the telecommunications industry and the telecommunications ministry. His snap shot of 'incumbent *amakudari* in the Telecommunications Industry, 1995-1996' (p. 105) illustrates that there were *amakudari* in the mobile telecommunications during the report period. My informant Mr. Mori stated that there are *amakudari* in all carriers and

> There are ways where *amakudari* could be initiated. The first one is initiated by the ministry's administration department, which means a request to a company to take up *amakudari* is made by the government. The second one is initiated by a company; a request is made to the ministry for *amakudari*. The latter one is the usual way of initiating an amakudari." (Narrative-Mori)

An example of there being *amakudari* in the Japanese mobile telecommunications industry, that is often quoted is the case of KDDI's Chairman as of 2005. Both Mr. Kimura and Mr. Sato mentioned KDDI's chairman is an *amakudari*:

> KDDI is spoiled in this respect. This highlights the critical resource of human connection. In my view, KDDI has achieved corporate and commercial advantage in the frequency band width allocation, through their chairman, who was the former top person (director general) in the telecommunications ministry. (Narrative-Kimura)

> For example, the KDDI chairman, who was the former vice-minister of Ministry of Telecommunications, worked in Data Communication Institution and two other institutes for two years before he joined KDDI as the chairman. (Narrative-Sato)

It is clear from these accounts that there is *amakudari* in the mobile telecommunications industry, and this phenomenon does exert influence in the industry. The *amakudari* are a key resource because they constitute an obligatory passage point in government-industry relations.

2.2.2 Role of amakudari

Johnson (1974) identified *amakudari* as a way of establishing a resource base relationship between government and enterprise organization. In this context, the role of *amakudari* can be considered, as a resource to the business organizations and a vehicle to access critical resources. Johnson (1974) provided an example of big corporations with *amakudari* having real time access to major government decisions. van Wolferen (1989) supported this view and asserted that the role of *amakudari* is to ensure that there is 'the smooth flow of information between bureaucracy and enterprises' (p.45). Calder (1989) stated a similar view and claimed that *amakudari* play a major role of broadening access to the government decision-making process and transmitting information to their adopted organization. In parallel, Schaede (1995) contended that the primary role of *amakudari* is to ensure direct access to information and to incumbent bureaucrats for limited resources. Nakano (1998) positioned the role of *amakudari* as being to ensure access to policy information and to provide lobbying in the regulatory process. He highlighted that one of the key roles of *amakudari* is to provide support for the implementation of or compliance with administrative guidance, in a contingent regulation environment, and articulated the role of *amakudari* as being to increase the certainty of regulatory outcomes. The existing literature does indicate that *amakudari* is a resource to both governments and private corporate organizations. My informants provided a view of the mobile telecommunications industry in Japan that is consistent with this existing literature.

According to Mr. Sato, the role of *amakudari* is to maintain communication between senior executives in the ministry and the corporate world:

> Mr. Ushio came to his position because he was good. He did a good job when he was the director general, then he was promoted to the vice-ministry position. He got a good reputation in Nagatacho area, where everybody knew and thought highly of him. Then KDDI appointed him as their chairman, two years after he had finished his career at the top position in the ministry. He still had some influence in the industry and ministry. Mr. Ushio is still working with KDDI and comes back to the ministry to maintain top level communication with our senior executives. I believe that he and the ministry have frequent communication. This sort of communication helps both the ministry and the company. It is beneficial for the ministry in managing the industry as well. (Narrative-Sato)

Mr. Sato highly regarded the informal communications between the *amakudari* and the executives in the ministry; he highlighted the importance of informal communication between a carrier and the ministry by quoting an example:

> From a technical perspective, Vodafone's entering into the mobile sector in Japan and becoming the only foreign owned mobile carrier did not really affect the relationship among the carriers. However, there might be some impact on the informal communication between J-Phone/Vodafone and the government. This is because we are not good at communicating in English. It could be a problem if Vodafone's VP could not speak Japanese. Sometimes, particularly, the senior government officials prefer not to have an interpreter in a conversation, it slows down the conversation and affects the tempo of the conversation. It is Vodafone's issue as it is their responsibility to maintain proper communication with the government. They could hire a Japanese president for their subsidiary in Japan. It took Vodafone many years, but finally, they did hire a Japanese ex-executive from NTT Docomo. In my opinion

> this move from Vodafone was late as they had suffered a decline of sales. (Narrative-Sato)

Mr. Sato's view distilled the role of *amakudari* into a vehicle for communication which helps both the ministry and the companies. Mr. Sato considered this role as important in facilitating interaction with the ministry and in managing the mobile telecommunications industry, which is consistent with Johnson (1974), Nakano (1998) and Schaede's (1995) views. It could be interpreted that, the ministry could, through *amakudari,* have frequent informal communications and obtain information about the mobile telecommunications carriers' compliance with rules and regulation, and useful information about the carriers in an effective and timely manner. As a result, the ministry could manage the mobile telecommunications industry in an effective and efficient way. In this way, the ministry benefits from *amakudari* in the mobile telecommunications industry in Japan. Mr. Sato highlighted the consciousness of the concerns that arise where communications are required or desired between the government and the industry. This makes the process of *amakudari* essential and the role of *amakudari* even more critical, as Mr. Sato stated:

> We know the government rule, i.e. there is something which KDDI and the ministry should not disclose to each another; as long as both parties observe the rule, there is no harm for communication. We have to avoid distorting the government rule as well. Communication between the government and a company is crucial when a company is handling political issues. And at the same time, we have to observe the government rules. We certainly want to avoid the situation where the operators do not observe the government's rules, and then the market will be distorted and the consumers will be harmed. (Narrative-Sato)

Mr. Sato clearly identified the issue of observing government rule and, at the same time, the requirement for communication between the government and the companies. It appears that the old boy network

(Schaede 1995) and familiarity through personal relationships could enable trusted communication in this environment. It is also apparent that there can be commercial advantage to positive communication between the government and the companies facilitated through *amakudari*. For instance, carriers can gain advantageous access to essential resource through *amakudari* (Calder 1989; Johnson 1974; Schaede 1995). Mr. Kimura provided an example of what he considered to be the commercial advantage that KDDI obtained through *amakudari:*

> In my view, KDDI has achieved corporate and commercial advantage in the frequency band width allocation, through their chairman, who was the former top person (director general) in the telecommunications ministry. This is a kind of Japanese custom, known as amakudari, where ex-bureaucrats join corporations. We welcome them, even though they are not necessarily creating any value to the company. In KDDI's case there have definitely been some beneficial results from this custom. (Narrative-Kimura)

Mr. Kimura considered that the *amakudari* are important but in some cases, that this may be considered as a form of sinecure, where the *amakudari* does not necessarily bring any value to the company; not all *amakudari* are equally valuable. However, there is no doubt that the institution of the *amakudari* provides a resource through which the government can influence behavior and outcomes when dealing with companies. Mr. Kimura highlighted the communication between the ministry and the mobile carriers through an example of how carriers react to an unexpected request from the government, for the provision of global positioning system (GPS) capabilities by mobile carriers, even though this request seemed to be a guideline:

> [S]uddenly they [the MPHPT] have stated that the GPS function is very important, and by 2007 or 2008, all the major mobile phone companies should have GPS capability for emergency incidents to help people. I can't say that the MPHPT's influence is always

> contributory to the industry growth. I am not sure whether this GPS requirement will be a mandate, because in the US, the government issued the same kind of requirement, but did not enforce it. The US government required all operators in US to support either GPS or cell-base location. It was requested that by summer last year everybody have this capability, but this has not happened. So, we see the MPHPT's request as a kind of guideline, but we have to do some work, because we cannot neglect the government's request.
>
> The KDDI has already embedded the GPS function in their high-end phone, but not so many people are using it. From the NTT Docomo point of view, the R&D cost to provide this GPS system is not too high and even though the GPS function is a money generating service, we are obliged to provide this capability. (Narrative-Kimura)

The above-cited field interview was conducted in 2004; it seems that KDDI was very responsive to the government's request and made the GPS service available a few years ahead of the ministry's requested time frame, which is unusual, according to commercial common sense. Mr. Kimura seems to be surprised by KDDI's early readiness of provision of GPS as his firm was still in the midst of doing R&D for GPS. Perhaps, KDDI became aware of the ministry's intentions and/or requirements earlier than other firms. Following the trail of the existence of a tight relationship that KDDI has with the Telecommunications Ministry, it seems that there is a phenomenon of "institutional embeddedness of corporate strategy" (Schaede 1995) in KDDI's business decision-making.

Mr. Ishida positioned this kind of influence through *amakudari* in the mobile carriers and handset companies and provided quantitative indications of the situation:

> There is strong influence on the industry through amakudari, the movement of people between senior positions in the bureaus and mobile carriers. There are over 30 former METI bureaucrats in the

> mobile carrier and handset companies. Sony Ericsson is a company that is an exception from amakudari. (Narrative-Ishida)

The role of *amakudari* is clearly positioned to provide information and influence. *Amakudari* is used to steer discussion and provide a conduit for government to provide guidance to mobile carriers. To a mobile telecommunications carrier, *amakudari* is a resource, to facilitate the understanding between the government and the firm, and increase the probability of favorable business outcomes, and to obtain other essential resources for it business operation. To the telecommunications ministry, *amakudari* is a resource to facilitate managing the industry.

2.2.3 Amakudari and sensemaking

It emerged from the data that the *amakudari* can be seen in terms of being embedded agents (Johnson 1982; Schaede 1995) that facilitate government and industry stakeholders making sensible economic decision (Granovetter 1985). Thus, *amakudari* are important actors in the process of sensemaking (Weick 1995) in the mobile telecommunications industry. *Amakudari* can be examined in the light of Weick's (1995) seven properties of sensemaking; these properties are (1) social context, (2) personal identity, (3) retrospect, (4) salient cues, (5) ongoing projects, (6) plausibility, and (7) enactment.

2.2.3.1 Sensemaking is embedded in social context

Amakudari is a social arrangement based on the political history of ex-bureaucrats which allows people to share relevant knowledge on the process and result of government deliberation and provide stakeholder industry comment into the government (Colignon & Usui 2001; Johnson 1982; Schaede 1995; Tsuru 1993). Therefore, the process of embedding ex-bureaucrats into the mobile industry through *amakudari* is a highly socially contextual act. *Amakudari* exercise conscious acts on behalf of the government and the industry which facilitates communication of shared relevant information (Colignon & Chikako 2003). The government and

private sector acknowledge the presence, purpose and benefit of the socially interactive nature of *amakudari* (Colignon & Usui 2001; Schaede 1995).

2.2.3.2 Sensemaking is grounded in identity construction

Amakudari is an institution in which ex-bureaucrats are aware of the functions and rewards as they develop their careers towards an *amakudari* role, as such they have individual purpose fusing with group identity. As ex-bureaucrats who join the private sector, they are clear about their identities and functions, as are the bureaucrats and the hiring private firms. Bureaucrats and business people know the identity and purpose of *amakudari*, and empower *amakudari* to function as a conduit of information for their sensemaking process.

2.2.3.3 Sensemaking is retrospective in nature

Sensemaking is influenced by memory of the past from the perspectives of time and detail (Weick 2008). *Amakudari* are embedded agents (Schaede 1995) that move from government bureaucracy to the private sector. They carry decades of memory and knowledge gained from their services with the government to the private sector; they have a wealth of knowledge based on historical context. These ex-bureaucrats also have access to newly created events and policies. *Amakudari* are able to communicate with the government frequently (Calder 1989; Colignon & Chikako 2003; Johnson 1982), they have real-time restrospectiveness regarding current and elapsed events which take place in the government and the private sector. As such, through *amakudari*, both government and the private sector can gain fresh retrospective understanding of what has happened and the processes which occurred during the decision-making process.

2.2.3.4 Sensemaking is about creating comprehensive stories from cues

Amakudari are able to notice subtle cues which help facilitate the information flow between the government and industry. The depth of

communication through subtle cues as well as formal communication allows key concepts and major discussed ideas to be captured and used by the ex-bureaucrats. The outcomes of such interactions can be considered as sign posts or clues to helping industry and government implement a politically constructed reality based on harmony and understanding facilitated by *amakudari*.

2.2.3.5 Sensemaking never starts and never stops

Sensemaking is an on-going process, as are business and industry development processes. *Amakudari* enable an ongoing process where government and private sector can tap into the flow of new information generated by their counterparties. The timeliness of such information influences sensemaking.

2.2.3.6 Sensemaking emphases plausibility rather than accuracy

When the private sector and government are trying to make sense of what is the best way to go forward in terms of the company level, industry level and society level benefits, there would be proposals based on vision, scenarios, forecasts and plans. Different parties would have different views of what is the best possible solution for the same issue, because these parties have different interests and different information and knowledge bases. In the mobile telecommunications industry, there are issues which have significant impact on the direction of industry development, in which the private sector and government have to be in sync. *Amakudari* is a vehicle that facilitates harmonious relationship between government and the industry, thus helping to allow synchronization of knowledge and views.

2.2.3.7 Sensemaking involves enactment of a sensible environment

Amakudari is not only an institution but also an environment in which ex-bureaucrats, business people and bureaucrats exchange ideas, and search for concepts by asking question and sharing information. This is an interactive environment for enactment of ideas which are subtly discussed and reactions captured, forming an integral part of the decision-making process.

2.2.4 How government mobilized amakudari as a resource to achieve their objectives

Amakudari, when it is considered to be either a "push" (Johnson 1974) from the government or a "pull" (Calder 1989) from industry, offers a one dimensional explanation of the phenomenon. Other dimensions are possible, such as seeing it as reward or "spoils" for the ex-bureaucrats or as an "equalization" (Calder 1989) mechanism to allow smaller firms to access scare resource through old boy (Schaede 1995) or tri-party interaction between politicians, bureaucrats and business people forming an "iron triangle" (Colignon & Usui 2001). *Amakudari* interpreted by any of these theories is still a human resource used to mobilize other resources.

The Japanese government nurtures bureaucrats and positions them selectively to join industry through a formal process administered by the government, where the *amakudari* remains loyal to the government (Schaede 1995). The practice of *amakudari* is influenced by the government and has a pre-determined nature:

> All positions for *amakudari* are pre-determined, for example a finance director will come from the Ministry of Finance; an IT director will come from MPHPT. The grading of the outgoing bureaucrat determines the position of an amakudari in the receiving company. Each *amakudari* cycle is 2 to 4 years, when the ex-

> bureaucrat leaves a company; he/she will receive an early retirement fee, that's why they keep moving on. The government will take care of 3 cycles of *amakudari.* One of the benefits of *amakudari* is that a company can have good relationship and good communication with the government, where informal information could be exchanged. (Narrative-Mori)

As articulated by Mr. Mori, the government's influence extends well beyond the initial move from government to enterprise, thus ensuring a long-term connection. It is realistic to think that, as time elapses, the connection between *amakudari* and the government will wane in proportion to the recipient company connection becoming stronger. However, the long-term connection through successive *amakudari* circles mobilized by the government and the movement of the ex-bureaucrats between companies has the effect of continuing the strong relationship and influence between the ex-bureaucrat and the government, which is consistent with Schaede's (1995) claim about the ex-bureaucrats' loyalty to the government. The movement between the government and the industry is considered as a negotiation; however, there is a strong *fait accompli* about the whole process, as Mr. Ishida described:

> *Amakudari* depends on negotiation between the human resource (HR) division of the ministry and the company. At the company request, the HR division of METI will provide a list of candidates. It is up to the division director to arrange or promote the arrangement. The final decision will be made by the HR, however, normally; the HR will follow the division's recommendation. Foreign companies also ask for amakudari, for example, IBM has requested for *amakudari* for a long time. Our Prime Ministry Mr. Koizumi wants to lower the number of *amakudari* over the next 5 years. There are three levels of staffing in the ministry: director; middle; and without degree. In the case of a level one Director, by the time one of the staff from the same year achieves the top job, there will be nineteen

> people leaving the ministry, some of them may join the industry through *amakudari*. (Narrative-Ishida)

The government re-enforces the practice of *amakudari* by allowing ex-bureaucrats to lobby the government successfully to provide favorable treatment to the ex-bureaucrat's new employer, Mr. Kimura provided an example in the mobile telecommunications industry:

> Radio frequency is a very important resource. Even though NTT Docomo has 56% of the subscriber market share, the government allocates the same frequency band width to all mobile carriers. KDDI is spoiled in this respect. This highlights the critical resource of human connection. In my view, KDDI has achieved corporate and commercial advantage in the frequency bandwidth allocation, through their chairman, who was the former top person (director general) in the telecommunications ministry. (Narrative-Kimura)

It is apparent that the government mobilizes *amakudari*, and the private companies need to accept it. Mr. Sato is a bureaucrat and his view is that:

> Recently, Softbank's president, Mr. Son, has made a comment in the media that he will not accept ex-bureaucrats for a hundred years. It is quite a comment. It is the social system in Japan and there is history for this social system. This *amakudari* system helps prevent bribery, especially in the later year of a bureaucrat's career. The system works pretty well when the economy is growing. After we accomplished the economic growth, the society itself has to change, but *amakudari* is one of the areas which didn't change.
>
> In the US, people can move from university, to FCC, and to a telecommunications carrier. But there is strict rule in place for this type of people movement in Japan. Ex-bureaucrats cannot freely decide which company to work for immediately after their retirement from the government. For the first two years, they can only work in the public sector, such as an institute, research center (with public

> sector characteristics), or non-profit organization (NPO). After these two years, they can join any company they desire. *Amakudari* happens after the first two years of retirement. For example, the KDDI chairman, who was the former vice-minister of Ministry of Telecommunications, worked in Data Communication Institution and two other institutes for two years before he joined KDDI as the chairman. I think there are a couple of ex-bureaucrats who joined J-Phone via *amakudari*. If now Vodafone asks the government to introduce a couple of ex-bureaucrats to help them to re-organize their company, we will co-operate with Vodafone provided that there are ex-bureaucrat(s) willing to do so. It is a simple business negotiation.
>
> The whole process of *amakudari* needs to be initiated by Vodafone. Vodafone is different from J-Phone in a sense, because Vodafone is a western listed company, and they are very conscious about their business strategies and actions because these will affect their stock price. Vodafone exhibits a shareholder-oriented management style. If Vodafone considers that there is shareholder's value in *amakudari*, they might initiate the process; otherwise, they won't request *amakudari*. For example, if Vodafone understands and appreciates the benefit of *amakudari*, in terms of information, connection and knowledge, they will participate in it. (Narrative-Sato)

It seems that Mr. Sato showed empathy with the "push" (Johnson 1974) dynamic of *amakudari*, where he considered *amakudari* is a custom in Japan which brings value to the society. It is clear from Mr. Sato's comments that he saw intrinsic value in *amakudari*, which needs to be understood by organizations. The push dynamic is in balance with Johnson's (1974) research during the period 1950s and 1960s, where amakudari needed to be "pulled" (Calder 1989) by the firms in the mobile telecommunications industry. The "pull" dynamic of *amakudari* might be influenced by the embedded ex-bureaucrats in the private sector, and is

another fertile topic for future research. Mr. Sato expressed negative feelings about Softbank's statement regarding not taking any amakudari into their business operation. The ministry cannot "push" *amakudari*, the relation has to be initiated by the private sector and Softbank's stance would effectively stop the flow of *amakudari* into this company. Therefore, the ministry needs to create and/or accelerate the "pull" of *amakudari* by making the private sector understand the benefits of amakudari to a firm. As articulated by Mr. Sato, 'if Vodafone understands and appreciates the benefit of *amakudari*, in terms of information, connection and knowledge, they will participate in it' (Narrative-Sato).

It seems that there is a negative view of the practice of *amakudari* in the larger society, where the then Prime Minister of Japan would like to decrease the number of *amakudari* in Japan, as stated by Mr. Ishida, 'Our Prime Minister Mr. Koizumi wants to lower the number of *amakudari* over the next 5 years'(Narrative-Ishida).

This could be a reason why the government would not "push" *amakudari* into the private sectors, and instead use *amakudari* consciously to balance the requirement of post-retirement employment (Johnson 1974; Schaede 1995) and the cost and benefit to the ministry at large. It seems that *amakudari* is important to the government as well as the industry, and the government might avoid pushing the button to pressure the Diet to prohibit the practice of *amakudari*.

2.3 Summary of data analysis on amakudari

Amakudari is a resource and a source of power in Japan. Both the government and industry stakeholders benefit from *amakudari,* as part of their respective sensemaking processes. *Amakudari* plays a role in the industry as a conduit of information, knowledge and communication, an obligatory passage point for central flows of information. The Japanese government reinforces the practice of *amakudari* by allowing ex-bureaucrats to lobby the government successfully to provide favorable

treatment to ex-bureaucrat's new employer. Furthermore, government exerts subtle influence through *amakudari.*

3. Data analysis on technology standard

In this section, I discuss, in the light of the existing literature, why technology standards are identified as a critical resource, the role of technology standards in industry competition and development dynamics in the ION relationship among the carriers, and how the Japanese government is involved in mobilizing this resource in order to achieve their objectives. The term, technology standard, in this study is applied to the activity of designing and constructing and maintaining a system – in this case, a mobile telecommunication system – which is established by authority, custom, or general consent. The understanding of technology standards which I use in my analysis sees it as a resource available for use by mobile telecommunications stakeholders to create and enlarge the mobile telecommunications industry in Japan. My research focus is on the role and implications of technology standards used by the government and/or the organizations in the mobile industry, and is not on the origination, the mobile vendors, the people or the process of creating a technology standard.

The framework of technology standards which is applicable to my research is explained within the Open Standards Interconnect (OSI) communications model Figure 6, which is a globally accepted telecommunications technology standard framework. The model was developed by industry stakeholders through international collaboration. The model facilitates product development in the complex telecommunications technical environment, with the aim of enabling effective end-to-end communication between users. In the OSI Model there are seven layers organized in a hierarchical structure. These layers are defined as (starting from the bottom); Layer 1 – Physical – which in my research is defined as the mobile network infrastructure layer; Layer 2 – Data – which is the transmission of data which, put into the context of my

research, is the data flowing over the wireless technology (such as PHS or W-CDMA) using the frequency bandwidth allocated by the respective authority; Layer 3 – Network – which in the context of my research is the backbone switching equipment and the interconnecting transmission network. Layer 3 is an enabling layer to connect with and communicate to the higher layers of Transport (Layer 4), Session (Layer 5), Presentation (Layer 6) and Application (Layer 7).

In modern communications models, layer 5 and layer 6 are sometimes set at "null", in other words the layer is bypassed, allowing direct communication between the Transport and Application layers. Applications are enabled through Layer 4 to layer 7, which form the "Host Layers" and are classified collectively, in my research as the "Platform" layer. The Platform layer provides capabilities through applications such as voice, data, *sha*-mail (picture mail over mobile handset) and ring-tone download, which are offered as services by mobile carriers. In Japan, carriers have developed their own platforms, e.g. NTT Docomo developed i-mode and KDDI au developed ezweb. Layer 2 – Data, is the transmission technology, which is discussed in this data analysis.

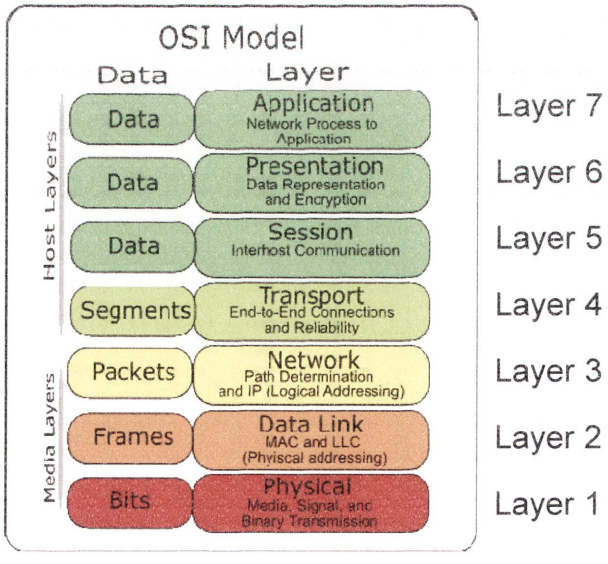

Figure 6. OSI Model

Source: http://www.vagnini.net/images/osi-model-7-layers.png

3.1 Literature review on technology standard

Technology standards are important elements in the telecommunications industry. They have a decisive impact on a telecommunications carrier's competitiveness in both its domestic market and the international market, through dimensions such as economies of scale, costing structure, availability of equipment and connectivity with overseas networks. A government's policies or lack thereof for a technology standard could influence technology adoption by the telecommunications carriers and consumers, and alter the competitive dynamics in the domestic market. A government's control or laissez-faire approach towards the choice of technology standard in the mobile telecommunications industry affects the dynamics in the industry in terms of adoption rate, local industry growth, know-how creation and export potential.

A number of scholars have elaborated arguments about the importance of technology standards, exploring technology standards from different perspectives, with different views and convictions. Brunsson (2000) analyzed standards and standardization. Katz and Shapiro (1985, 1986) explored economical theories of network externality and technology adoption pattern; Arthur (1989) theorized the path-dependency of technology adoption and technology lock-in; Schilling (1998) constructed frameworks of technological lock-out, while Farrell and Saloner (1985) built a bandwagon theory of technology adoption. I shall consider the main contributions next.

3.1.1 Brunsson's world of standards theory

According to Nils Brunsson (2000), standards are a form of guidance, and standardization providing co-ordination and control on the basis of agreed procedures. Standardization influences people and/or organizations to perform work in a desired manner or accomplish a planned result. Standards reflect what is best or at least desirable and certain standards may be seen as obviously superior and consequently be adopted. Standards are often used directly or indirectly to serve personal interests

and to exert extensive control when orders and directives are unavailable, thus are used as a basis for competition. As Brunsson acknowledged, all forms of control need strong arguments to be accepted and legitimized.

Standards tend to favor some actors to the disadvantage of others. Therefore, there is competition among standards, because stakeholders are competing to obtain the most advantageous position in the political and/or the commercial world. In technical terms, a particular standard is likely to be better adapted to the hardware, know-how, and traditions of one manufacturer than those of others. Thus, standards may not only promote but also inhibit competition and innovation. In practice a third party may make it difficult for actors to avoid using a standard. Standardization may control organizations but not individuals and, standards adoption being voluntary, places the responsibility for selection with the purchaser or user. There is a higher responsibility factor if a purchaser goes their own way rather than adopting a popular standard.

The need and opportunities for standardization increase when organizations cannot resort to directives or orders to shape affairs. The leadership may lack the authority, legitimacy, or power to exercise control through directives and orders, especially where some independent units may consider themselves as not needing to comply. Organizations often use external common standards for co-ordination, control and choice. Through this action, organizations can avoid making their own decisions. It is possible that markets may even be prevented from being created if there is an absence of a common standard. For, example, if special product adaptation is required because of national legislation, esoteric market conditions, or national standards, local markets may be closed. China's government promoted a 3G mobile standard called TDS-CDMA, reflecting a situation where a technology standard was promoted and mandated by a government such that the respective product/service development for the new technology standard and markets fell behind expectation. As of end of 2007, 3G mobile service has not been

successfully rolled-out in China, which is a few years behind the original target.

Brunsson discussed the positioning of standards and 'norms', where 'norms' are a form of co-ordination. If the same norms are shared by individuals, they will find it easier to work together and attain common goals. By definition a norm must be accepted and internalized. Most norms are created by a prolonged process such as a close long term affiliation with others. The need for standardization increases with globalization, because of the absence of a strong formal organization at the global level, and because, in the multitude of cultures encompassed, there are often no common norms.

Brunsson challenged the idea that standards are voluntary, by stating that when standards are not voluntary they are most effective and added that coordination is most effective when the following of standards are predominantly involuntary. Based on Brunsson's view, technology standards are a resource for organizations, whether they are considered as voluntary or involuntary, because they provide political and/or commercial advantages and the basis for competitive advantage, which are essential for a firm's survival. Governments and firms could manipulate this resource to provide differentiation and inhibit competition. Organizations are trying to achieve economies of scale at a global level; therefore, the need for standardization increases with globalization. Mobile telecommunications carriers and equipment vendors are motivated to establish their chosen technology standard as the *de facto* standard, to enhance their chance of success by enlarging their technology's roaming capability, thus increasing desire for the technology and service, and increasing the size of installed base and creating positive network externalities effects.

Brunsson's theory provides a framework to understand why the Japanese government encouraged the creation of W-CDMA for the local market and actively promoted W-CDMA as the Universal Mobile Technology Standard

(UMTS) in the International Telecommunications Union (ITU) (Funk 2002). The desire to obtain economies of scales and to create exportable technology could have motivated the Japanese government to promote the creation of an international mobile standard which originated in Japan. Interorganizational influence can be exerted through sharing or not sharing know-how related to technology standards, and thus creating competitive advantages or market inhibitors through interorganizational networks. For instance, the tight relationship between the mobile carriers and the mobile handset manufactures in Japan has created a dependency relationship between organizations, based on technology standard as a resource (Funk 2002).

3.1.2 Katz and Shapiro's network externality theory

Economists Katz and Shapiro (1985) defined network externalities as 'the utility that a given user derives from the good...[which] depends upon the number of other users who are in the same "network"' (p. 424). They suggested that there are three sources of consumption externalities: (1), the number of users of the product, for instance the utilities of a telephone user increases as the number of telephone users increase; (2) indirect effect from the number of users of the product, for instance the availability of personal computer compatible products will increase as the number of personal computer users increases, personal computer users benefit, as there are more complementary products available, and (3), the quality and availability of post-purchase service depends upon the number of users of a durable product; thus, as the number of users increases, the better the post-purchase service will be, and so the users will benefit.

Katz and Shapiro theorized, using economic equilibrium models, that 'if consumers expect a seller to be dominant, then consumers will be willing to pay more for the firm's product, and it will, in fact, be dominant' (Katz & Shapiro 1985, p. 425). For durable goods, the expected size of the future customer base will determine consumer purchase decisions, based on the premise that the consumers' benefit is dependent on the future size of the

relevant network, where the scope of a relevant network is determined by whether different firms' products may be used together. For instance, in the computer market, the relevant network comprises the products with common operating systems, where the same software could be operated regardless of the brand of computer in which it is installed. When network externalities exist in the market, the consumer's expectations play a critical role in determining the eventual size of the customer base of a product. In other words, in a market where network externality exists and firms are offering different technology standards, consumer's expectation of the eventual size of the customer base will determine which technology standard will be dominant, and may become the *de facto* standard in the market.

Katz and Shapiro stressed that 'firms with a good reputation or large existing networks will tend to be against compatibility to protect their dominant position, even when welfare is increased by the move to compatibility. In contrast, firms with small networks or weaker reputation will tend to favor product compatibility, even in some cases where the social costs of compatibility outweigh the benefit' (Katz & Shapiro 1985, p. 425). Their model highlights that it is possible that public policy has an impact on compatibility decisions. It illustrates that public policy could exert influence on a firms' decision locus and on the feasibility of side benefits, in ways that are determining factors of a firm's decision on compatibility.

In summary, technical compatibility is another expression for standardization, and sponsors and "network externalities" affect technology adoption (Katz & Shapiro 1986). Government policy can influence a firm's decision in relation to technology adoption. Katz and Shapiro provided a scene-setting for technology adoption sponsored by firms and driven by network externalities which parallels the collaboration between the Japanese government and NTT Docomo in creation and promotion for W-CDMA and the interorganizational collaboration between mobile carriers and handset manufacturers, in terms of compatible handsets for the chosen technology standard.

3.1.3 Katz and Shapiro's technology adoption theory

In 'Technology Adoption in the Presence of Network Externalities', Katz and Shapiro (1986) expanded their earlier research on network externality (Katz & Shapiro 1985). The crux of Katz and Shapiro's (1986) theory is that the pattern of technology adoption is dependent on whether the focal technology is sponsored, where a sponsor owns the property rights of the technology and is willing to invest in promoting the technology. They examined 'two basic questions regarding the process of industry evolution: (1) will the market achieve *de facto* standardization? (2) when the market does choose a standard, is the choice the socially optimal one?' (Katz & Shapiro 1986, pp. 824-825).

Katz and Shapiro (1986) stressed that the benefits of network externalities can be achieved by adoption of *de facto* standardization where all consumers purchase the same technology. Based on the concept of network externalities, the consumer derives benefits from the use of a good that often depend on the number of other consumers purchasing compatible items. The benefits of having compatible products are increased when network externalities are significant. Inter-firm cooperation is required to produce compatible designs, which may raise production costs and market supply issues.

Katz and Shapiro supported the view that the technology that is superior at the outset of the emergence of an industrial field has a strategic and first-mover advantage, and can generate network externalities effects and create a critical mass, which may enable it to become potentially locked in as the standard. In some cases, this could prove to be an inferior standard. The relative attractiveness of a technology is influenced by its sales history, i.e. there are "demand-side economies of scale", where a given product is more attractive, based on the larger installed base. For instance, for a mobile carrier, being a pioneer of a certain type of service, which is based on a particular technology, launches service in its brand in the market; it will build the largest installed base from the beginning,

because there is no other comparable service in the market, i.e. no other installed base. According to the theory of network externality (Katz & Shapiro 1985), potential customers will view this service positively, because of the sales history, a positive feedback cycle will be created, i.e. there will be more customers purchasing this service, and availability and price of complementary and compatible products/services will become better. As there is a large customer installed base and large investment in making the complementary and compatible products/services available, switching cost for the market as a whole will be very high, thus potentially, this service might become the favorite brand in the market, and, concomitant to this, the technology enabling this service might lock in as the technology standard for the market.

If a single firm controls the property rights to a given technology or if there are other entry barriers into the supply of that technology, then the supplier will be willing to make investments such as penetrating pricing set below marginal costs; Katz and Shapiro identified such a firm as a "sponsor", and the technology as a "sponsored technology". Sponsored technology may dominate the market even when all consumers agree that a rival, non-sponsored technology is superior. The sponsored pricing for the product/service and sponsored availability and pricing of complementary product/service entice customers to purchase the product/service. Based on the economics of supply and demand or demand elasticity, the installed base will be built up, creating a positive feedback circuit of network externalities. Whereas, in the absence of sponsors, the technology that is superior today will have a strategic advantage and is likely to dominate the market.

In summary, network externalities have two fundamental effects on the dynamics of industry evolution. First, the relative attractiveness of rival technologies is influenced by their sales history, i.e. the existing installed base. Second, current consumers in the market also care about the future success of competing products, i.e. the forecasted future installed base. Katz and Shapiro outlined that a firm may choose to sponsor the

technology through penetrative pricing in order to improve the technology's chances of being adopted. This can be compared with sponsored technology which attracts R&D investments to create a product and complementary goods to drive network externalities for the sponsored technology. According to Katz and Shapiro, this kind of sponsoring of activities could be considered as affecting random choice for consumers and set up a pattern which can become a non-ergodic process, as outlined by Arthur (1989).

3.1.4 Arthur's lock-in theory

Arthur's (1989) research examined the path dependency of technology adoption and provided an economic model to determine the nature of technology adoption based on non-sponsorship and random selection of equal probability with an influencing-effect based on initial technology sequential selection of customers that drives a bias towards a particular technology. In a scenario where technology selection is unbiased, that is a situation of pure chance with equal outcome probability, a sequential string of one technology selection will increase the certainty of that technology being further adopted, based on the theory that the customer will select the technology which is going to have 'increasing returns' through a larger future installed base. Increasing returns represents a condition where an increase in adoption of a technology will increase the economic benefits, e.g. cost, to adopter of the technology. Arthur articulated the guiding force of the significant few historical 'small events' in creating a non-ergodic or path-dependent process that influences the technology adoption, which can create a path dependency which leads to technology lock-in.

Arthur examined both ergodic and non-ergodic processes and established that technology lock-in is a path dependent (non-ergodic) process upon which historical 'small events' have an impact, whereas a non-path dependent (ergodic) approach can encounter different sequences of historical events and lead to the same market outcome. His general framework preserves two properties: '(i) That choices between alternative

technologies may be affected by the numbers of each adopted at the time of choice; (ii) That small events 'outside the model' may influence adoptions, so that randomness must be allowed for' (Arthur 1989, p. 123). Adoption market-share may have an impact on the probability of customer's choosing each of the focal technologies, instead of which technology will be chosen. In the increasing returns case, a *laissez-faire* approach gives no guarantee of the long term survivability of a superior technology. When several technological options become available, sequential adoption by users might rapidly lead to the supremacy of a single option regardless of the superiority of the technology.

In Arthur's model, early adopters impose externalities on later ones by rationally choosing technologies to suit only themselves. Arthur's expectations case describes how agents' returns are affected by the choices of future agents. This theory can be applied to explain why firms and government are promoting the technology standard which will directly or indirectly create benefits for them, both now and in the future.

In summary, whether a technological standard will come to dominate is dependent upon a series of historical 'small' events. The outcome of the adoption of the technology is therefore complex and hard to predict. Schilling (1998) on the other hand claimed that it is possible to predict the dominance of a technology.

3.1.5 Schilling's technology lock-out theory

Schilling (1998) built an integrative model to predict technology success and failure, with a focus on technology lock-out. She defined technological lock-out as a situation 'in which a firm finds itself unable to develop or competitively sell products to a particular market because of technology standards' (Schilling 1998, p. 269). She hypothesized that technology adoption is neither wholly random nor beyond a firm's control. Schilling's integrative model derives recommendations for how technology development should be managed in order to avoid lock-out.

Schilling suggested that technology adoption is a path dependent process, which might lead to two types of technological lock-out. Under Type I lock-out, a company can be locked out through (1) failure to invest in learning; (2) lack of complementary goods: and (3) insufficient installed base, where installed base could be affected by "network externalities" and/or timing of market entry. Under the Type II lock-out, a company's technology could be locked out by (1) failure to invest in learning, and (2) existence and effectiveness of competitor patents. She concluded that the major factors influencing technology adoption, such as the size of the installed base of a firm's technology, the availability of complementary goods and its timing of market entry, are affected by internal strategic choices and therefore are within the control of the firm.

There are factors that may have an impact on the adoption of technology such as how, and by whom, the technology is sponsored. A large firm aggressively sponsoring a technology may pressure suppliers and distributors to gain a controlling share of the market. A company which is vertically integrated forward or has a strategic alliance with distributors or users of its technology may have an advantage in quickly establishing an installed base of their technology and availability of complementary goods. If complementary goods providers are few, technology sponsors may use exclusivity contracts to preemptively "capture" these providers, thereby securing a scarce resource, e.g. the supply of complementary products, and possibly create a competitive advantage. The adoption of a dominate design is driven by a combination of forces from increasing returns to adoption, i.e. the more the goods are used the more they are improved, pressures for compatibility, and/or government regulation.

In summary, Schilling (1998) established that when an industry is characterized by network externalities, customer's choice between competing technologies, will be strongly influenced by the installed base and the availability of complementary goods (Katz & Shapiro 1985). A technology with insufficient installed base or lack of complementary goods may result in technological lock-out. Such a situation manifests itself as an

installed base effect on technology adoption. Not being locked out does not mean that a technology is "locked in". Several standards may compete, on an on-going basis, without a dominant design being locked in.

In 'Technology success and failure in winner-take-all market', Schilling (2002) extended her earlier work (Schilling 1998) to establish that although technology adoption is path-dependent, it is possible to predict the success and failure of a technology. If a technology has an initial adoption advantage, it will probably benefit from the learning curve effects or the earlier take-off in the development of complementary technologies. Initial adoption advantage may lead to exponential growth in the installed base of the technology, to a scale that it is nearly unassailable. The benefits of compatibility gained by manufacturers, distributors, and customers can be a compelling driving force for these stakeholders to adopt a single technology standard. An amplifying cycle is therefore created; the more consumers use the technology, the stronger the technology and compatible products grow, and the more customers adopt the technology. Other technologies may be locked out of the market, regardless of their superiority in functionality or value. Compatibility induces convergence towards a single technology platform.

Schilling stressed that investment in learning is crucial to enabling a firm to keep up with trends in technology development and have an advantage when developing revenue-generating projects through meeting customer expectations. She articulated a dilemma wherein firms which develop their technology based on the existing standards may have a higher chance of accelerated adoption; however, this might lead to forfeiting the ability to control the future technology development.

Being a first mover may confer the advantages of technology leadership, preemption of scarce assets, and exploitation of buyers' high switching costs. The net result may be a U-shaped relationship between timing of entry and likelihood of technology lock-out.

Schilling's research (1998; 2002) shows that the size of an installed base, the availability of complementary goods, the learning orientation, and the timing of entry, all significantly influence the likelihood of a technology being locked out. Further, the research showed that the size of the installed base and the availability of complementary goods was highly correlated. When this occurs it forms a "virtuous cycle", whereby as installed base increases, so does the development of complementary goods. Firms may also want to sponsor the development of complementary goods to jump-start their technology's virtuous cycle.

3.1.6 Farrell & Saloner's bandwagon theory

Farrell and Saloner's (1985) central argument is that the benefits of standardization can hinder an industry by getting it trapped in an obsolete technology, where the choice might have been an alternate technology if there had been more complete information and firms' preference were identical. There could be a direct "network externality" in the sense that one consumer's value for a good increases when another consumer has a compatible good, as in the case of telephones. Most standardization is voluntary rather than mandated by authority, and is driven by "network externalities" among producers, where producers have the incentive to make their products compatible with their rivals. Thus, compatibility may enhance economies of scales and price competition among sellers. However, a dominant player could leverage incompatibility with competing products as a strategy to protect itself from substantial decline in market share.

When a market is enjoying benefits from compatibility of standardization, stakeholders might become collectively reluctant to switch to a superior standard, mainly due to the coordination problems involve in such migration. In Farrell and Saloner's (1985) model, the information under consideration refers to the information about other firm's preferences regarding the choice of technology and whether other firms will follow or jump on the bandwagon of switching technology. Given a condition of

unanimity and complete information among the firms, if all the firms would benefit from such a standard migration, then the migration will happen. In this ideal scenario, in Farrell and Saloner's words, there is no "excess inertia" stopping such migration.

There are two kinds of excess inertia that inhibit technology migration; they are "symmetric inertia" and "asymmetric inertia". "Symmetric inertia" occurs when the involved firms are unanimously yet moderately favoring technology migration to a particular technology, yet they do not change because they are insufficiently motivated to initiate a bandwagon effect. *Status quo* is the result. "Asymmetric inertia" occurs when the involved firms have different preference over technologies, regardless of the fact there will be cost benefit of the migration.

In a condition where information about the keenness of firms in the market is incomplete, the timing of firms' take-up will depend on their own keenness to adopt a new technology. Such adoption will occur chronologically, where firms having a strong preference for the new technology will adopt early, followed by the firms with moderate preference for the technology, and influenced by the earlier adopters. In other words, the firms with strong preferences will be the first ones joining the bandwagon and the other firms will follow. Farrell and Saloner demonstrated that incomplete information introduces excess inertia where adoption of a new technology is favored by both firms, yet adoption does not happen. They established that communication of information about the preference of firms in the market could eliminate "symmetric inertia", however, when there is "asymmetric inertia", such communication could increase inertia.

3.1.7 Summary of literature review

In the light of the Japanese mobile telecommunications industry technology standard, I counter-posed my research against the theories and findings of Brunsson (2000), Katz and Shapiro (1985 & 1986), Arthur (1989), Schilling (1998) and Farrell & Saloner's (1985). Their theories

provide a potpourri of views and a classical backdrop to espouse my views on why technology standards are a resource, how this resource affects the ION relationship among the mobile carriers in Japan, and how the Japanese government can mobilize this resource in order to achieve its objectives.

The theories generally agree that standards are a strong influence on market dynamics and that customer's real and perceived take-up of technology and the availability of compatible goods are strong influences for the survival and/or prevalence of a technology. A strong theme that emerges is that sponsors and installed base strongly influence customers' decisions on a technology and cause a "network externality" effect driving current adoption based on future perceived customer choice. Today's network externality is affected by perceived future network externalities. In this context, a technology standard can be identified as a resource to drive industry development and market growth. These phenomena can be applied to the mobile industry in Japan, and create the potential for mobile players to harness this resource under the right conditions, influenced by the Japanese Government, to create a significant domestic market and develop export potential.

The literature review identified several unifying concepts under the umbrella concept of technology standard, which help one to understand the process of technology adoption and the role that government, sponsors and customers play in technology adoption and standards acceptance. Standards play a key role in determining technology adoption in the domestic market and can strongly influence the competitive nature of an industry and facilitate international exports, which are key market and motivational drivers from the Japanese government perspective.

Brunsson (2000) highlighted the voluntary nature of standard adoption. There are two tiers of implication, they are, first, the product/service vendors' voluntary choice of technology standard adoption, and second, the consumers' voluntary choice of product/service enabled by different

technology. The survivability of a product/service vendor's choice of technology, i.e. whether a vendor's chosen technology will be able to dominant or be locked out (Schilling 1998) is very much dependent on how consumers perceive the future installed base of such technology (Katz & Shapiro 1988). Decision on adopting a technology could be irreversible, because of the sizable cost of reverting to the original technology (Farrell & Saloner 1985) or converting to a third technology.

Irreversible decision consequences are exemplified and amplified in the mobile telecommunications business; mobile carriers are required to make decision on transmission technology, which directly affects their investment and design of telecommunications network infrastructure, and business model, including handset strategy and distribution. If a carrier chooses to adopt a technology without ensuring sufficient supply of handset and other complementary products, this carrier's service could be locked out of the market because of its chosen technology (Schilling 1998). Note that the availability of suitable radio frequency spectrum is a constraint for the choice of transmission technology, because, without obtaining the respective radio frequency spectrum, a mobile carrier cannot adopt its favored technology. Thus, a carriers' decision in choosing technology for their next generation service, e.g. 3G, is a major decision, and therefore, thorough consideration and deliberation are required. Information about preferences for technology could be a commercial secret. Without a channel for communicating such preferences, innovation and adoption of new technology could be crippled (Farrell & Saloner 1985).

Decision-making on adoption of a new technology is particularly challenging to mobile carriers. This process is more complicated than technology take-up in other industries, because of the integral nature of technology, standards, frequency adoption and the relationship between network externality effects driven by the availability of complementary goods and the perceived large volume of future customers.

There is no guarantee that after a mobile carrier first adopts a new technology, other mobile carrier(s) will join the bandwagon. If all mobile carriers adopt a wait-and-see approach, the result will be *status quo*. Schilling (1998) identified that early adopters could have the advantage from early pick up in the learning curve. Nonetheless, Farrell and Saloner (1985) established that early adopters have to bear the risk of no other firm adopting the technology or joining the bandwagon. Thus, there will be no windfall of network externalities (Katz & Shapiro 1985) or increasing return (Arthur 1989) from further adoption of the focal technology. Farrell and Saloner's (1985) theory highlights the potential need for communication between the Japan government and industry, which is manifested through *amakudari*, to help overcome excessive inertia.

Based on the reviewed literature, the decision-making on technology standard adoption is complex and dependent on multiple factors. The characteristics of the mobile telecommunications industry add further complication to such decision-making process. Choice of transmission technology is constrained by availability of radio frequency spectrum, which is controlled by government agency. Mobile service is provided through seamless operation from infrastructure to mobile handset, this involves large numbers of equipment and service vendors. Adopting a new technology requires seamless collaboration and cooperation among multiple vendors and the carrier. If a carrier could coordinate and motivate various vendors and parties to support adoption of a new technology standard, e.g. to ensure availability of services enabling infrastructure equipment and handset, this carrier could leverage the adopted technology standard as part of its business strategy and create a success story with the new technology standard.

3.2 Discovery in this research

The network externalities and technology adoption literature (Katz and Shapiro 1985, 1986; Arthur 1989, Farrell & Saloner 1985; Schilling 1998, 2002), which I have examined, could help in sensemaking of certain

aspects of development of the mobile telecommunications industry in Japan.

Resources are what an organization requires to produce its product/service and take them to market. In the mobile telecommunications industry, technology standards could be viewed as a resource because the mobile telecommunications industry requires technology to enable the constituent components of their service and the industry requires technology standards to enable seamless service provision and connectivity. The role of technology standards does not stop at the provision of services; it plays a role in the carriers' business strategies, as theorized by Schilling (1989, 2002). These strategies affect the ION relationship (Benson 1975) among the carriers. The Japanese government involvement exerts influence in the adoption of technology standards in Japan, in the form of policies that are more or less either laissez-faire or interventionist.

3.2.1 Existence of technology standards as a resource

The Mobile telecommunications industry is characterized by complex layers of underlining network technologies; the layers of technology are illustrated in the OSI model (Figure 6). There is a technology standard embedded in each of the layers in the OSI model. These layers need to technically interfaced and interoperate with multiple dimensions of technologies in order to enable carriers to offer mobile telecommunications services. The technical interface is also referred to as a technical standard. Choice of one technology standard has a critical impact on the auxiliary technological requirements and design, functionality, and availability of complementary and compatible products. Thus, technology standards have become increasingly important to enable modern communications.

One informant, Mr. Kimura, stated that in the Japanese mobile telecommunications industry, service carriers, providing 3G services, are more heavily dependent on technology than before. Thus, according to

Mr. Kimura, technology standards are playing an increasingly important role in the mobile telecommunications industry:

> In the 'Voice Age', as I call it, before the 'Multi-media Age', the only real dependent resource was the vendor, whom we depended on for manufacturing telecommunications handsets and base stations.
>
> Now, in the Multi-media Age, for services like i-mode, we not only depend on the vendor, but we heavily depend on the content providers, IT solution providers and the internet backbone providers. Because without them, we cannot generate our traffic, or the subscriber cannot use the rich content on the internet. Now we depend on the IT industry people. Without their resources, we cannot do our business. We are depending on more external resources than in the past as we have moved from the Voice Age into the Multi-media Age. (Narrative-Kimura)

Mr. Kimura did not mention technology standards in the Voice Age as a resource *per se*, however, he positioned the vendors who supply handsets and base stations supplies, which are all technology standard driven, as a resource and therefore these can be considered derived products emanating from technology standards resource. Without developing or adopting a technology standard, mobile service carriers will not be able to provision mobile telecommunications services. In the Multi-media Age, mobile telecommunications carriers need to encompass technology standards for more operational areas from external sources, therefore positioning technology standards as a critical resource.

Based on complicated technological design and architecture, mobile customers can visualize and use mobile handset features, receive good quality voice through the handset, and experience value-added services provided by carriers. All these sensory experiences are based on and realized through layers of technologies, including the network and platform technology, which are invisible to customers; they cannot see nor touch the technologies beneath the services that they are enjoying. In contrast,

customers could see, touch, feel and experience the services through the complementary products, such as mobile handset.

In the mobile telecommunications industry, truly a "network industry", the complementary products, such as mobile handsets, play a critical role in fostering network externalities. Handsets seem to be more than a complementary product; for example, we can draw a parallel to the role of CD player described by Katz and Shapiro's (1985) in their analysis of CD technology standards. The CD player is the mechanism used to deliver the music stored in CD format; therefore, following this lead I define the handset as a complementary product facilitating the industry, in a way that is similar to how a CD player facilitates music. It is the handset, most likely not manufactured by the carrier, which serves as the delivery mechanism for the carrier's core services, i.e. voice and data. In Japan, handsets serve as a means to attract customer to subscribe to a carrier's service. Therefore, the availability, functionality and price of handsets could make or break a mobile telecommunications carrier business, particularly where the underlying network technology is inseparable from the customers' choice of handset.

Katz and Shapiro (1985; 1986), Arthur (1989), Schilling (1998; 2002) and Farrell and Saloner (1985) discussed the existence and importance of installed base effect on technology standard adoption, which eventually determines the success or failure of a product. According to Funk (2002), in recent years the most debated competitive area of technology standards in the mobile telecommunications industry has been the transmission standards layer, i.e. for 3G mobile technology, W-CDMA (the UMTS, EU standard), CDMA2000 (US company, Qualcomm, owned technology) and TDS-CDMA (standard created by China). The choice of core transmission technology by a carrier has multiple implications and dimensions for their business model. These include whether the chosen technology is backwards compatible to the existing network; whether it is a total technological discontinuity; whether the technology uses the same or different frequencies; whether equipment suppliers will be able to supply

the required quantity of base stations at a reasonable price; whether there will be adequate supplies of attractive handsets at affordable prices, and whether there will be roaming partners available overseas, i.e. a customer can only roam on an overseas partner carrier's network if they had compatible transmission technology and handsets.

In Japan, NTT Docomo developed, jointly with Nokia and Ericsson, W-CDMA based UMTS for their 3G services (Funk 2002), J-Phone followed NTT Docomo in using UMTS, and KDDI au adopted CDMA2000 to offer their 3G service. These technology decisions have profoundly influenced the development of the Japanese mobile industry. Concomitant with these technologies, carrier specific handsets are developed as strategic delivery mechanism for the carrier specific value-added services.

The complementary goods element in the network externalities theory (Katz & Shapiro 1985) plays an important role in the mobile telecommunications industry. In theory, availability of complementary goods is driven by forecasted installed base for the technology and the level of sponsorship from the technology owner and/or licensee (Katz & Shapiro 1986). In Japan, mobile telecommunications carriers have strong ties with equipment and handset manufacturers (Funk 2002), which helps the carriers to ensure availability of handsets, their critical complementary products. Mr. Ishida provided an account disclosing the clusters of Japanese carriers and their handset manufacturers:

> In Japan, there are three main mobile carriers, NTT Docomo, KDDI and Vodafone; these carriers have their specific mobile handset suppliers. NTT Docomo has mobile handsets supplied from NEC, Panasonic, Fujitsu and Mitsubishi handsets. All of these handset manufacturers, in their own rights, have strong ties with NTT Docomo. KDDI has mobile handsets supplied from Sharp and Toshiba. Toshiba is very strong in chipsets. Vodafone has mobile handsets supplied from Sharp and Sony Ericsson. Sharp is very strong in LCDs. In the mobile handset industry, chipset and

> operating system are basic technology; it is on the application layer where the differentiation happens. (Narrative-Ishida)

Mr. Ishida highlighted the close coupling of carriers and complementary goods manufacturers. Mr. Kimura extrapolated on this theme through an example to illustrate the close product development relationship that his company has with a handset manufacturer:

> From 1999 to 2004 and beyond is the Multi-media Age, where there is increased competition. NTT Docomo changed the direction and the whole industry tried to put additional value, beyond the voice capability, into the phone and the service. For example, by embedding the finger printer authentication in mobile handsets we introduced secured access to mobile services, this allowed us to offer value added services such as e-wallet. It was at our request, the handset maker conduct R&D in how to put finger printer authentication in a mobile handset. These value added services have been the competitive engine to drive the industry for the past five years. (Narrative-Kimura)

The close relationship between mobile carriers and complementary goods' suppliers is most important when there are changes or discontinuities in the environment. Both parties need to work very closely together in such a disruptive circumstance to ensure development of complementary products with a seamless interface with the core services provided by carriers, to ensure timely availability of such complementary products, and to ensure that customer will be attracted by the handset and its features and capabilities.

Technological discontinuities in the mobile telecommunications industry in Japan have been realized through technology migration from 1G-analogue, to 2G-digital, to 3G-enhanced digital. Customer migration to a new standard depends on the network externality of the next technology standard. From 1G to 2G migration the take up rate was exponential, because of the much enhanced handset features, significant weight

reduction of handset, battery usage time increase, and low prices. From 2G to 3G migration, the compelling reasons are new handset dependent services and content richness and availability. Mr. Fujino articulated how the availabilities of handsets have helped carriers to jump-start their 2G digital mobile services and address the technological discontinuity from 1G analogue service:

> When we think about it now, the 1G handset issue was not going to be a big deal, as the market expansion for 2G is overwhelming. The 2G handset is much better, smaller, battery life is longer and lighter. Therefore, customers would naturally migrate to 2G services. If the 2G handset technology had not been so advanced (i.e. 2G handset is smaller than 1G handset), the 1G handset ownership issue might have been problematic. (Narrative-Fujino)

In summary, in the mobile telecommunications industry, technology is a key resource for service enablement and the handset is the mechanism for delivering services and these are fundamental building blocks of a mobile carrier's business model.

3.2.2 Role of technology standards

The mobile telecommunications industry is characterized by the critical role played by technology standards in industrial level development and in the business level competitive environment. These are inter-twined thorough complex and dynamic network effects and the handset dependent nature of the industry. Technology standards affect the ION relationship among the mobile carriers in multiple dimensions, for instance, carriers use technology standards such as network transmission standards strategically to lock in handset manufacturers in this competitive landscape. They use their chosen transmission technology standard to build their network, deliver feature rich handsets facilitating the development of their business through attracting and keeping customers. The key to success for carriers is to build a large customer installed base and forecast the future installed based (Katz & Shapiro 1985). Customers,

both prepaid and contract (post-paid) customers, who subscribe to a carrier's services, drive the network externalities theories.

In mature mobile telecommunications markets, i.e. markets with high penetration rates, the number of new customers joining the market is incremental. A new customer is defined here as a first-time mobile telecommunications service subscriber. When an existing mobile telecommunications customer leaves carrier X and joins carrier Y, he/she is a "churn-out" customer of carrier X and a "churn-in" customer to carrier Y. Churn is an expensive and revenue affecting exercise and therefore churn rate is critical for a mobile carrier's success. Mr. Kimura highlighted the importance and necessity of controlling customer churn:

> In the mobile industry, the most important business performance factor is retention of the existing subscribers. How to lower churn rate and how to acquire new subscribers are key focuses of mobile carriers. We are competing with each another very intensely; as a result, we are gaining and losing customers every month. I predict that the volume of churn-in and churn-out would be much bigger after the government introducing MNP in 2006, because the volatility of the market will be affected by the lower barrier for subscribers to switch between carriers. (Narrative-Kimura)

Essentially, this highlights the importance of the size of the installed base in the network externalities literature (Katz & Shapiro 1985, 1986; Arthur 1989, Farrell & Saloner 1985, Schilling 1998, 2002), especially in an environment where it is easy to change carriers, which is facilitated by Mobile Number Portability (MNP) regulation where mobile numbers can be freely moved between mobile carriers. In the Japanese mobile industry, mobile carriers need to increase their installed based and manage churn to ensure that they will not be locked-out from the market (Schilling 1998).

Mobile carriers need to craft and execute business strategies to minimize their churn-out customer number, maximize their churn-in customer number and maximize acquisition of new customers. A carrier minimizes

the churn-out of customers to protect their existing installed customer base. A carrier maximizes the churn-in customer number and acquisition of new customers to expand their installed customer base. A carrier needs to create and execute a competitive business strategy in terms of product and service differentiation, customer lock-in, actions to excluding competitors from its installed base and capture the global network externalities effect. Technology standards are one of the resources that a carrier uses to underpin their strategies and grow customer installed based on these key strategies. The relationship is illustrated in Figure 7. Technology standard and competition strategies.

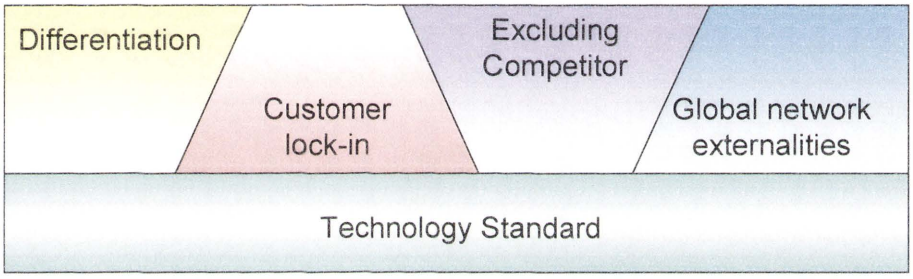

Figure 7. Technology standard and competition strategies

These strategies are driven by the underlying network externalities rationale, i.e. to ensure a large installed base and availability of complementary goods and services, the mobile carriers need to seduce customers to use their services. One key way of doing this is through the handsets, which can be network linked.

As of the end of 2004, in Japan the Subscriber Identity Module (SIM) card is embedded in the handset, whereas in most countries the SIM card is transferable between mobile handsets. As a result, in Japan a customer, when purchasing a handset, is tied to a specific network and service provider. When a potential mobile customer enters a mobile services shop in Japan, in general, there will be sales staff selling different carrier

specific handsets. When the customer purchases a handset with an embedded SIM card, he/she is going to join a service plan offered by the mobile carrier which is tied to the handset. The customer mobile number attached to the SIM card will be the customer's mobile number, for as long as he/she subscribes to the carrier. When this customer leaves the carrier, he/she needs to purchase a new mobile phone with a new embedded SIM card with a new mobile telephone number from a new carrier.

At the time of my research in 2004; there was no Mobile Number Portability (MNP) capability in Japan and without MNP, subscribers find it prohibitive to change service providers. For example, for a mobile customer to switch from carrier X to carrier Y, s/he has to inform most, if not all contacts about the change of mobile telephone number. Mobile customers are thus deterred from switching carriers, because most, if not all, mobile customers would find it costly to switch, in terms of losing one's contacts, the fact that one can no longer be reached at the old mobile number, and time spent on informing contacts about the change of mobile telephone number. There is a physical switching cost for mobile customers as well as an inconvenience cost.

3.2.2.1 Differentiation

In Japan, there are only three companies providing mobile telecommunications services, and according to conventional wisdom the market is an oligopoly, inferring limited competition. However, in terms of technology standard based competition, the market is intense. Technology standard competition is used to provide data and other value-added services, in addition to traditional voice services, to create differentiation to protect and grow their customer bases. Mr. Sato described this phenomenon:

> If you are qualifying competition in the telecommunications market by the number of players in the industry, compared to ADSL, where there are a lot of players, there are fewer players in the mobile sector, and thus the competitive pressure in the mobile sector is not

> so high. However, there are other factors affecting the competitiveness in the mobile market, such as technological competition. If a company can introduce new technology, new services, and/or improve quality of the service, it can gain competitive advantage. There is competition between NTT Docomo, KDDI and J-Phone. J-Phone started an innovative *sha*-mail service a few years ago, which created a competitive lead for J-Phone and change the competitive landscape in the mobile industry. (Narrative-Sato)

Mr. Sato clearly articulated the relationships between technology and competition and how these forces interact to create differentiation. Mr. Kimura highlighted this technology based differentiation:

> These operators are not only competing on differentiated service but also on using different underlying technology systems to compete with each another. This is a different situation than in other Asian countries, where every mobile operator is using GSM; there is no competition between systems.
>
> For the 2G, we use PDC network, which is the Japanese standard. For 3G, we are using UMTS, our competitors are using CDMA, so even in the system layer, we are competing with each another. That's why the competition is very intense. (Narrative-Kimura)

Mr. Mori supported this view by stating the corollary that, under the condition of common used standards, there is little opportunity for service differentiation:

> Because there is no commonly used technical standard, there is competition among the carriers to use their own technology to differentiate their services, for example improve speed of transmission. If there is technology standard, all carriers will be using the same technology, things might be simpler, but as a

> consequence services differentiation could be less, e.g. the transmission speed might be slower. (Narrative-Mori)

Clearly, carriers can create differentiation through applied technology standards. Mr. Sato explained technology based differentiation in terms of the next generation of mobile services creating rivalry in 3G mobile services rollout:

> Although there is competition through technology in the 2G mobile services market, the next major horizon of competition is 3G mobile service. KDDI au has launched their 3G service CDMA2000 and NTT Docomo has launched FOMA, and the rivalry is quite strong.(Narrative-Sato)

A carrier creates their own platform for services application development, based on their chosen technology standard. i-mode is one such platform developed by Mr. Kimura's company to provide differentiated services. In Mr. Kimura's words:

> In the late 1990s we started to think about how to differentiate ourselves from other mobile operators. We started the i-mode service by embedding the Internet function and IT technology into the mobile phone handset. In 1999, we started i-mode; other operators delayed providing the same kind of service. (Narrative-Kimura)

In summary, mobile carriers in Japan use technology standards as a source and resource for product/service differentiation.

3.2.2.2 Customer lock-in

NTT Docomo, the largest mobile service provider in Japan, uses the ability to customize and personalize services and handsets, making them indispensable for daily life activities (Beck & Wade 2003). Carriers make their customers dependent on the technological capability manifested through lock-in applications, such as the electronic wallet. The electronic

wallet is a prepaid wireless cash card, enabled by a wireless smart chip with which to conduct transactions through the handset for goods and services which is provided by the handset. Mr. Kimura outlined his company's vision for customers lock-in, and provides an example of a technology based customer lock-in strategy:

> It is my vision and my company's vision to cover all aspects of human life by mobile phones. We have covered one third of Japan's population with mobile handsets already, and we are now searching for new ways of fostering growth. This is why NTT Docomo installed an IC card into our customers' mobile handsets, so our customers can pay money using the 'wallet' phone at convenient stores. By offering this service, NTT Docomo is now depending on much wider industries, including the distribution, vending machine and transportation networks. Companies such as ANA and JAL have already decided to adopt this technology for validation at boarding gate entrances; we are now also depending on the airline companies. (Narrative-Kimura)

Carriers are able to develop applications, based on their chosen technology standard, that lock-in customers. These applications create tension in the ION relationship among the carriers by creating forces driving innovative and differentiated services. Such tension intensifies the competition among the carriers, since they need to develop better strategy to decouple or un-lock their competitors' customer, to successfully acquire new customers, to lock-in their own customers, and to avoid their competitors from decoupling their existing customers.

3.2.2.3 Global network externalities

Japanese PHS and PDC mobile technology standards failed, because of the inability to harness global network externalities and therefore gain economies of scale facilitated by export markets (Funk 2002). The failure raised awareness of the importance of global network externalities for any new mobile technology. Global network externalities are exemplified

through Vodafone, a global mobile carrier. Vodafone is the largest mobile service provider in the world, in terms of total customer base. When Vodafone joined the mobile market in Japan, it brought the reality of the global network externalities effect into the Japanese market. Vodafone introduced a new dimension of global network externalities in terms of roaming capability and economies of scale. These were considered as commercial threats and well beyond anything previously experienced in Japan (Funk 2002). The reason for PHS and PDC's failures is seen to be that they did not address this type of commercial reality (Funk 2002), for which they would have had to recognize the necessity of creating a global standard and/or partnership to achieve a competitive strategy. Mr. Kimura, explained the competitive threat of Vodafone in Japan and the need for NTT Docomo to expand their horizons and acquire access to, and benefits of, global network externalities:

> From a competitive point of view, Vodafone will be able to challenge i-mode, the most advanced technology at this moment, as they acquire synergy through their overseas 3G operations. This threat has forced NTT Docomo to go overseas and create i-mode alliances with telecommunications carriers such as Telstra, the dominant carrier in Australia, to grow the economy of scale. Our current i-mode partners group consists of eight operators covering fourteen countries, which has an aggregated base of more than 60 million customers. Our alliance customer base is bigger than our number of subscribers in Japan. (Narrative-Kimura)

Vodafone changed the competition dynamics of the mobile industry in Japan. Prior to Vodafone's joining, carriers in Japan focus on the domestic market, and all their strategic priorities were local. This was reflected in the PHS and PDC eras in Japan, when Japanese carriers and handset manufactures ignored the wider possible network externalities beyond Japan. Vodafone's competitive advantage in being a global carrier and owning compatible networks that operated on a global level and size created tensions in the ION relationship among the Japanese carriers.

NTT Docomo was forced to create products and address the global network externalities phenomenon.

3.2.2.4 Excluding competitors

Telecommunications carriers have active strategies through technology standards to exclude or minimize competition in the market. Technology standards are used by carriers as a resource to create competition exclusion in Japan. The market peculiarity of having handsets inextricably tied to carriers' networks is one of these exclusion strategies. The handset strategy is manifested through mobile carrier sponsorship, which forces compatibility of handsets to their particular networks. Mr. Suzuki indicated how companies external to the sponsoring company are excluded from entering the mobile telecommunications market in Japan:

> The lack of a wholesale model is partly due to the mobile handset-dependent business model[11]. In Japan, if an Mobile Virtual Network Operator (MVNO) wants to resell mobile services, it has to sort out the handset issue, as a particular mobile service wholesaler has its own technology and own particular handsets. This involves a huge investment to realize an MVNO business model. (Narrative-Suzuki)

Carriers use technology to create services which are only available on their network and not able to be interconnected to, or inter-work with any other carrier. This acts as an exclusion principle to hinder other carriers from acquiring relevant installed base (Katz & Shapiro 1985), creating competition and exclusion based on compatibility and inter-working restrictions which carriers can use as competitive barriers, or to create situations where potential competitors are excluded from entering the

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[11] *The Japanese mobile industry is characterized by a number of networks which have exclusive accessed through handset which are designed for that network, and that are not usable on other networks. This has created a handset-dependent business model.*

market. It is a situation that parallels Katz and Shapiro's (1985) claim that 'firms with a good reputation or large existing networks will tend to be against compatibility to protect their dominant position, even when welfare is increased by the move to compatibility. In contrast, firms with small networks or weaker reputation will tend to favor product compatibility, even in some cases where the social costs of compatibility outweigh the benefit' (Katz & Shapiro 1985, p. 425), Mr. Mori provided an example highlighting how NTT Docomo did not do anything to enable KDDI au's C-Mail, SMS type of messaging service, to send to NTT Docomo's customer's handset, thus, by default creating the situation of the inability of KDDI au's customers to send their text messages (C-mails) outside of the KDDI au's installed base. In Mr. Mori's articulated that:

> Carriers not only get the users connected within their own network, but also enable their users to connect to users from other networks. There are merits among each carrier to entice their customers to stay within their networks and encourage their friend and family to also join their network. To this end, mobile carriers provide value-added services that are esoteric to their mobile services that are not necessary able to use through connection to other networks. This is a kind of customer lock-in strategy. Mobile carriers are using the issue of connectivity as a tool for competition. Currently, the C-mail service from KDDI au, which is equivalent to SMS, is contained as a service within the KDDI au mobile customers, these C-mails cannot be sent across to mobile customer on NTT Docomo and Vodafone networks. (Narrative-Mori)

In summary, mobile carriers in Japan use technology standards to provide differentiation and create intra-services to lock-in customers and lock-out competitive carriers through restricting inter-working capabilities. In this context, technology standard is a resource to protect and grow customer installed base and facilitate network externalities.

3.2.3 How government mobilizes technology standard as a resource to achieve their objectives

Based on the network externalities and the global economies of scale, a technology standard can be viewed as a critical resource in which a poor choice of technology standard will become a liability for a carrier. The Japanese government has learnt the importance of this resource from the history of PHS and PDC and the growing importance of having a global market for export of their mobile handsets (Funk 2002).

Mr. Ishida from the Japanese government indicated that the government is not satisfied with the mobile industry development in Japan, and in particular the competitiveness of Japanese mobile handsets in the global market:

> Over the last ten years the competition in the mobile handset industry has declined, which has weakened the industry. It is because the handset makers are too close to NTT Docomo, they concentrate on producing products after receiving orders from NTT Docomo. NTT Docomo actually allocates the quantity of handsets to be ordered among the handset makers.
>
> None of the Japanese mobile handset companies is among the top mobile handset companies in the world. One of the reasons for this is the mobile technology used in Japan is not compatible with other mobile standards in the world. (Narrative-Ishida)

From this experience, the government has learnt that the key is not necessarily the selection of technology but how the technology is relevant to local and global markets, how quickly it can be adopted, and the availability of complementary goods, such as handsets. According to Mr. Mori, the Japanese government has taken a *laissez-faire* approach in determining technology standard adoption, leaving the mobile carriers free to choose their mobile technology, knowing however, that such decisions would be taken in context of the necessity of global standard

requirements, and the historical legacy of past mistakes in technology decisions. Mr. Mori stated that:

> In Japan, there is freedom to select technology and there are multiple technical solutions in the mobile telecommunications industry. However, there might be interoperability problems among the mobile carriers. For example, the use of different frequency modulation such as WCDMA and CDMA, may be an issue. (Narrative-Mori)

Mr. Mori supported the view that a hands-off government approach to technology selection, allowing carriers freedom to choose technology standards, has accelerated industry development:

> I think the absence of restriction from the government on technical standards helped the mobile industry. For mobile carriers, they have the freedom to use whatever technology they like, that's why they developed their own technologies and there is a revolution in the mobile telecommunications technology in Japan. (Narrative-Mori)

Mr. Kimura appreciated the government non-involvement in determining technology standard adoption in the mobile industry. He articulated that if there had been mandated technology, the Japanese mobile industry could have adopted an inferior technology, choosing that which was prevalent at the time, which could have crippled the development of the Japanese mobile industry.

> If the government had standardized the technology for application layer, some five to seven years ago, there would have been no revolution in the application layer. The government would have mandated all operators to adopt WAP, which was the dominant technology at the time, albeit a terrible technology. (Narrative-Kimura)

Although the Japan government left the choice of technology standard to the key players in the mobile industry, the government did, however, support the adopted technology and encouraged competition through the adopted technical standards. This was also done at an international level where the Japanese government tried to influence global decision, where the Japanese government sponsored technology standard developed jointly by NTT Docomo, Nokia and Ericsson to become the UMTS in EU (Narrative-Kimura). Such decisions present an example of a "small event" (Arthur 1989) which influences the path of technology adoption. Mr. Sato articulated this government's role in sponsoring Japanese technology standard in a global arena:

> The government supports competition through determining the technical standards. We have our ex-vice minister as the head of ITU right now, and we try to get the most advantage from his position. It is a technological strategy, and our ministry is part of it. There are many stakeholders in this strategy, e.g. METI and the Ministry of Education, it is a corporate effort to serve the strategy. There is competition for technological standards, particularly competition for becoming the de facto standard. (Narrative-Sato)

Mr. Kimura highlighted that the Japanese government is aware of the importance of supporting technology standard and is involved in the key areas of standardization of network technology and spectrum allocation:

> The government has assisted the mobile services industry and influenced its development, especially in areas of standardization of network technology. Standardization occurs among operators and manufacturers and the network and spectrum allocation and all network layer aspects. (Narrative-Kimura)

Government support for technology is applied in the early stage of technology application where the government is involved in supporting Japanese companies involved in investment into new technology development. Mr. Sato indicated that the government is involved in

financing fundamental research to assist development in the telecommunications industry,

> The government is providing financial assistance from the national budget for fundamental research in the mobile telecommunications industry. However, there are strict rules on funded research; only fundamental research is eligible for funding. (Narrative-Sato)

In summary, the Japanese government is conscious of technology standard as a valuable resource, and the need to allow technology selection to take place under free market forces. However, once chosen, the government has a role to be involved in assisting the development and adoption of such standards at a local and global level.

3.3 Summary of data analysis on technology standard

Technology standard is critical to the development of the mobile telecommunications industry. Choosing a technology standard which has the potential and/or did become a dominant technology will bring network externalities to the mobile carrier. However, a carrier could be locked-out if a wrong technology standard is chosen. Thus competitiveness of carrier is enhanced by choosing a winning technology standard.

Based on the lesson learned from the lack of global level of network externalities and economies of scale of the PHS and PDC, the Japanese 2G mobile standard, the Japanese government encouraged NTT Docomo, the incumbent carrier, to use or create a global standard for the 3G mobile technology (Funk 2002). In collaboration with Nokia and Ericsson, NTT Docomo created the WCDMA standard. The Japanese government had played a role to promote WCDMA as one of the global UMTS in ITU, which is critical to create global level network externalities and realize global economies of scales.

4. Data analysis on frequency spectrum

In this section, I discuss, in the light of the existing literature, why radio frequency spectrum is identified as a critical resource, the role of radio frequency spectrum in industry competition and market development dynamics, and how the Japanese government is involved in mobilizing this resource in order to achieve their objectives. Frequency spectrum refers to radio frequency spectrum in this research.

For my research, radio frequency is defined as the rate of oscillations or number of occurrences of a repeated event per unit of time, within the range of 3 Hz (Hertz) or cycles per second and 300 GHz (giga - 1.000,000,000 or 1 billion) cycles per second. Radio frequency spectrum is referred to as 'spectrum' in this research. Frequency allocation refers to the process of a state authority dividing radio frequency into blocks or bands of frequency, and designating particular purpose of usage for each of these. Most developed countries have a comprehensive radio frequency allocation chart[12], for instance; radio frequency is allocated for purposes such as military, aviation, TV broadcasting, satellite and mobile telecommunications. Frequency assignment refers to the process of final subdivision of bands of frequency in which an organization obtains an assignment or license to use the assigned radio frequency band at a particular location under predetermined conditions, i.e. allocation of spectrum license. In most countries, frequency spectrum licenses are issued with terms and conditions, which include a time-frame for using the associated spectrum, in which the terms and conditions are subject to renewal application and approval. Note that "spectrum allocation" is also

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12 Australian radiofrequency allocation chart is available at http://www.acma.gov.au/webwr/radcomm/frequency_planning/spectrum_plan/arsp-wc.pdf

used to refer to spectrum license assignment in various articles and research. Contextualization is required for correct interpretation of the text.

The term bandwidth refers to the difference between the upper and lower cutoff frequencies assigned to and used by a user. In the mobile telecommunications industry, these frequency bandwidths are assigned by an authority to mobile carriers, through a variety of means such as direct assignment, auction or lease. These mobile carriers use their assigned or acquired frequency bandwidths to create areas of service operation or cells in which mobile customers move between and use the services provided by the mobile carrier. Mobile carriers are totally dependent on having frequency bandwidth available to them, and the amount of spectrum that they are able to acquire or use will determine the number of mobile services that they can support, as well as the richness and the reach of their applications. Frequency bandwidth is particularly important in 3G mobile services, where bandwidth dictates the boundary for mobile carriers' business operation and capability to provide basic voice service and value-added multi-media services, for example, music downloads and mobile internet access services. Radio frequency spectrum is a determining factor for mobile carriers' choice of transmission technology. Specific frequency spectrum is required by each type of transmission technology, for instance, GSM-900 requires 900MHz and GSM-1800 requires 1800MHz and CDMA requires 800MHz and 1.9GHz bands. Mobile carriers can choose a particular transmission technology where the associated radio frequency has been allocated for mobile telecommunications purpose and where the mobile carrier is able to acquire the respective radio frequency band.

The history of radio frequency is, in part, the history of modern communications technologies. Commercial usage of radio frequency was born in the early 1920s; radar was invented in 1935, and broadcast to support TV, which became a popular household good in the 1950s (Oniki 2006). Once a frequency spectrum is allocated and assigned, the user organization will invest and develop equipment and deploy infrastructure

and offer services accordingly. State authorities who are responsible for frequency allocation and assignment might or might not be able to envisage the future technological development related to usage and demand of radio frequency. The mobile telecommunications industry has been experiencing exponential growth in developed and developing countries, albeit in different time frames.

The associated technological development and demand for radio frequency was unforeseen when the first mobile phones were used in Japan in 1979. Prior to the popularization of mobile telecommunications services, radio frequency spectrum had been allocated and assigned in most, if not all, countries, according to the specific protocols of the countries in question. Historically, in some countries the patterns of allocation of radio frequency spectrum could become a hurdle to the development of mobile telecommunications services. For example, the popular GSM-900 and GSM-1800 mobile system could not be used across the US, because the associated frequency spectrum had long been allocated and assigned for other purposes, with the 1800MHz band, in particular, being allocated for domestic military communication use. The US military and an associated network of stakeholders invested huge amounts of money and effort to develop their communication systems and equipment based on this frequency spectrum that they had obtained from the government. One implication of the comparative national uses of spectrum is that the government's involvement in spectrum allocation and assignment and the decisions that it makes are critical for the development of the mobile telecommunications industry. During the process of spectrum allocation, if a government is well informed and enabled to envisage the technological development direction and market demand trends, this government could be in a better position to enable the mobile telecommunications industry and create room for long-term industry development.

4.1 Literature review on frequency spectrum

Radio frequency spectrum is a critical element in the telecommunications industry. Radio Spectrum is a scarce and indispensable resource for the provisioning of mobile telecommunications services (Gruber 2005). As a national asset (Oniki 2006) it is a finite resource allocated and assigned by governments in most countries. The nature of spectrum is such that it is inherently limited in capacity and once allocated and assigned it is provided on an exclusive basis, in most cases for an extended period of time to enable mobile telecommunications services and negate radio frequency interference. The spectrum allocation and assignment processes need to take into consideration the frequency range, the size of the bandwidths and the guard bands[13] to provide quality spectrum to mobile carriers in proportions that allow economically viable services to be provided. The allocated spectrum is used in an exclusive manner by organizations which have the right to use it. Several mobile carriers can operate in the same geographical region by using the spectrum which is exclusive to them. Being in a situation of vying for this finite and indispensable resource creates tensions among the ION relationships of mobile telecommunications carriers. If the total available spectrum in a particular region is 100% of that theoretically available, the mobile telecommunications carriers operating in this region are competing in a zero sum game to obtain a bigger piece of the pie of the spectrum with which they will gain advantage in terms of their capabilities for supporting a larger number of customers and be able to offer superior services.

The process of obtaining frequency spectrum is dependent on the government. Currently governments use four typical mechanisms for

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[13] *Guard bands are bands of spectrum, which do not carry any services and act as gaps between mobile service carrying spectrum bandwidths, so as to reduce interference.*

spectrum assignment: (1) first-come-first served; (2) lottery; (3) beauty contest; and (4) auction. The first three mechanisms can be regarded as administrative procedures, while auction is considered a market-based mechanism (Gruber 2005). Through these mechanisms mobile telecommunications carriers in one form or another compete for frequency spectrum. Mobile carriers may collaborate with other organizations to acquire or access this resource. Thus, the carriers may negotiate amongst themselves for their respective dependency (Greenwood 2008). Spectrum bandwidth assignment both shapes the roll-out of mobile telecommunications services and frames a telecommunications carrier's competitiveness. Spectrum is what a mobile carrier needs to acquire to provide a service; a license to use a spectrum legitimizes a carrier's usage of the associated spectrum. There is a wide range of literature related to spectrum as a resource in the context of the mobile telecommunications industry, exploring issues such as methods of spectrum assignment and their implications on the relationship between license fees and idle license (Gruber 2007). I focus on the literature which is specifically pertinent to my research about how frequency could affect the ION relationship among mobile telecommunications carriers and how the government influences such ION relationship in the resource dependence regime.

I will consider the government's influence on (1) the underlining frequency spectrum allocation and assignment processes which determine the availability and appropriateness of frequency spectrum to the mobile telecommunications industry, (2) determining the number of licenses issued and (3) the cost structure of the license fee borne by the mobile telecommunications carriers, which are critical for the development of the mobile telecommunications industry. The number of licenses issued by the government influences the market structure, thus the competitive dynamics of the industry. The cost structure of license fees includes the total amount to be paid by the licensees and the timing of such payment; these affect the financial ability of the licensees in terms of investment in the service, R&D spending, network rollout and service provision, as well

as the quality of their service. All these influence the competitive dynamics of the industry.

4.1.1 Spectrum allocation – role of the market

Radio spectrum is both a natural and a social resource with unique characteristics in terms of fostering co-operation among users and the ability through frequency interference to create negative externalities. It is natural in as much as it is a naturally occurring phenomenon; it is a social construction in so much as how the available spectrum gets to be divided up and allocated. In an early and definitive contribution, William H. Melody stated that 'radio spectrum is a scarce resource to be allocated by national governments' (1980, p. 393). From this perspective valuable spectrum is wasted if not allocated and controlled in a manner that maximizes its usage and prevents interference. It is clear that spectrum has a significant economic and political value which is reflected in the power associated with the spectrum allocation bodies as well as the resale value of companies that own spectrum and the price that they paid for these rights.

Spectrum is fundamental to expanding communications and there is a large expense incurred in using higher frequencies to increase the availability of this resource. The use of higher frequencies brings with it concomitant costs as the technology required to create mobile services equipment with very high frequencies is much higher than the established technologies available to capitalize on the current frequencies in use by mobile carriers. Hence, the resource of spectrum is relatively inelastic in terms of substitutability and availability. Also, new equipment that can use higher frequencies is initially made in low volumes and therefore has high prices.

Melody (1980) highlighted the North American experience, where frequency was provided at low cost, as an example of inefficient usage of spectrum as there were frequency bands which were idle while others were heavily congested. In this case, the practice of the administrative authoritative charging nominal fees based on administration costs, did not

facilitate economic gain from the spectrum nor exploit use of it most efficiently. The authorities should examine different scenarios of fee structures for capturing unearned economic value of spectrum, for the public treasury, according to Melody. He stated that 'the market cannot be an efficient substitute for the administrative process in achieving either allocation efficiency or the broader objectives of the process' (Melody 1980 p. 396).

According to Melody, there has been discussion about spectrum license allocation in America since the 1960s, when there were suggestions for replacing administrative allocation. These ranged from proposals of hybrid market-administrative allocation to having the market wholly replace administrative allocation. The proposals included '1) creating a market in freely transferable spectrum rights to substitute for the administrative license allocation process; 2) auctioning spectrum licenses; 3) establishing shadow prices [14] for spectrum assignments and/or exchanges; 4) establishing administrative license fees based on opportunity cost or other standards of valuation' (Melody 1980, p. 394). He contended that neoclassical market theory assumptions support argument for the effective role that an efficient market could play in spectrum allocation. These assumptions state that, (1) compared to administrative decision, decision determined by markets will be superior; (2) a greater use of markets automatically moves spectrum license allocation efficiency towards its optimal point; (3) opportunity cost improves allocative efficiency; and (4) the objective of the spectrum license allocation process should be optimal efficiency.

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[14] In Melody's article "shadow prices" refers to indicative price of the spectrum assignment, Melody did not specify who was responsible for setting the indicative price.

Melody highlighted the problematic nature of the market driven spectrum license allocation mechanism associated with defining property rights for spectrum transfer through the interference of unfettered radio emissions, which are not monitored and policed by any bureaucratic agency. He articulated the non-competitive nature and socially negative externalities associated with market driven spectrum theory and the inability under such a regime to achieve broad social, political and economic goals. The corollary is that these can be achieved by administrative authority involvement in spectrum license allocation and administration process.

In summary, in Melody's view, although spectrum license allocation practiced by administrative authority fails to achieve optimal efficiency and capture the economic value of spectrum, leaving spectrum license allocation to private economic markets is not the solution either.

4.1.2 A property rights regime and a commons regime

Faulhaber (2006) highlighted the future of wireless telecommunications becoming an integral part of people's life as communication/telecommunications shifted from being location-oriented to people-oriented. Further, as more bandwidth consuming applications are developed by service providers and used by consumers, it is critical to have frequency spectrum available to mobile service providers to develop and deploy more services. There are costs associated with the benefits of mobile services, and the 'drawbacks to wireless are closely related to the complete dependence of wireless services on the use of spectrum' (Faulhaber 2006, p. 260). Faulhaber cited two major drawbacks (1) access to spectrum and (2) interference. These two drawbacks are cause and effect related to the condition that the smaller the availability of spectrum available, the more the interference.

Faulhaber also stressed that the spectrum license allocation system implemented in America by the government bureaucracy has led to a poor allocation of spectrum license and its inefficient utilization. The US 'is administratively close to being out of spectrum' (Faulhaber 2006, p. 257).

In an economic sense there is sufficient spectrum; however, it is not being made available under the bureaucratic control regime. After 75 years of bureaucratic spectrum management, although there is high volume of spectrum licensed, spectrum remains largely underutilized in America. Faulhaber's (2006) central argument is the necessity to move away from a "command and control" system of the US government bureaucracy to a property rights regime and a commons regime for access to spectrum for efficient and effective use of this valuable resource.

The property rights regime proposal is based on Ronald Coase's (1959) classic paper, in which Coase argued, based on his analysis of the regulation of radio frequency for radio stations, that given that transaction costs are absent, when property right in the relevant frequencies are clearly defined, radio stations would achieve a win-win situation and eventually the right to broadcast would be in the hands of the organization which is able to generate the highest economic value from the use of the radio frequency, regardless of the initial assignment of frequency spectrum license. Faulhaber (2006) summarized the Coasian answer as 'place all licenses into private hands and let the market allocate license for specific frequency bands/location/power to ensure that these licenses are put to their highest value use' (p. 263). Thus, auction and trading of radio spectrum is considered as a more economically efficient mechanism than bureaucratic license allocation; this is based on the premise of the superior efficiency outcome from market forces driven over bureaucratic processes. However, the license rights, obtained through auction granted by the US government, do not constitute property; thus, the licensee cannot trade or sell their licenses without permission from the government. There is a long journey before spectrum licenses can be freely traded in the US market. Property right regimes cannot be achieved until there is a significant change in the license rights associated with the granted licenses.

The commons regime is based on the "techno-utopia of the commons", depending on advanced "smart" radio technology, with which hardware could resolve inherent radio interference problems in wireless

telecommunications; thus it is not necessary to maintain the system of licensing frequency bands (Faulhaber 2006). However, this technology solution to the problem of spectrum assignment by the bureaucrats was not the conventional practice either at the time that Faulhaber's article was published or at the present.

Faulhaber summarized his analysis of the mechanism of frequency spectrum assignment by noting that it is easier to identify the direction such assignment needs to follow rather than to identify how to achieve that direction. While he stressed the inefficiency of bureaucratic spectrum assignment, he concluded that the property rights regime and common regime are not ready to unlock spectrum from the government control.

4.1.3 The role of license fee

Gruber (2001) examined the effect of the frequency spectrum assignment method on the market structure and performance of the mobile telecommunications industry. Regulation influences the market in multiple dimensions, including (1) the amount of spectrum license allocated to the industry, which directly correlates to the degree of market fragmentation; (2) the technology standard approach, i.e. whether the standard is to be selected by the market or the regulator, by frequency allocation, a state authority may be determining the available choice of technology (Funk 2002) and (3) the amount of license fee for using frequency spectrum to be borne by the firms. Among these issues, the number of spectrum licenses allocated by the government exerts the most influence over the market structure of the industry.

When a government fixes the number of licenses available in the market, it has an exogenous effect on the market structure. The method of spectrum assignment and the levy exercised on spectrum license chosen by a government will determine the market structure and business dynamics of the industry. If a government chooses spectrum license auction, it allows firms to compete for the limited number of licenses with the ability to offer a higher bid.

Gruber (2001) quoted examples in European countries, such as the UK and Germany, where, through auctions for spectrum licenses, mobile operators paid up-front exorbitant license fees for their spectrum licenses, based on market optimism for mobile services at the time of auction. Such behaviors created a market-constructed reality in which very high license fees created artificial barriers to market entry. Gruber described such license fees as "endogenous sunk costs" which can discourage market entry, drive firms to leave the market, and create bankruptcies in the industry. Thus, the endogenous sunk costs of license fees, exert influence on market structure; structurally, where the number of potential bidders and competition is large, the higher will be the license fee potential and therefore the lower the number of firms staying in the market for the long-term as the more marginal operators disappear as a result of the unrealistic cost structures that they have saddled themselves with. Auctions thus tend towards oligopolistic outcomes, which may encourage firms to seek collusion or co-operation with other firms and the formation of joint-bidding and joint-spectrum ownership arrangements. An interesting corollary is that countries which establish low spectrum license fees will have less collusion as there is little incentive for firms to cooperate. Conditions can arise where the original licensees might exit and new entrants, paying different license fees, perhaps lower than their predecessors, will enter. Gruber claimed that 'the stability of market structure that is ultimately obtained depends on the government's ability to credibly pre-commit itself to keep the number of firms exogenously given, at any license fee that has been offered to pay' (Gruber 2001, p. 67).

Gruber (2001) posed a question to governments: 'what is the priority: maximize revenue from sale of a public resource such as frequency spectrum, or foster competition to the greatest extent possible?' (p. 69). His analysis supports the proposition that the auction of frequency spectrum might lead to excessive license fees and excessive endogenous sunk costs, which, in turn, will determine the market structure by driving licensees' business into an unsustainable state, and forcing post-entry

collusion in the market. The result may be different from the regulator's original objective for market structure. In summary, high license fees lead to a lower number of firms being able to be sustained in the market.

4.1.4 Summary of literature review

It is a legacy that governments in most countries assumed the role of radio frequency spectrum management, allocation and assignment. The literature highlights in various dimensions how the government's command and control system is an inefficient system for the allocation and assignment of frequency spectrum. However, due to the peculiar nature of frequency spectrum as a public resource, fragmented frequency spectrum will create inefficiency in the market operation, and mobile telecommunications providers need to invest significant amounts of money and time into building the infrastructure for provisioning service, it seems that the market mechanism might not be able to address the disadvantages of government's control and command role in frequency spectrum allocation and assignment. A strong theme that emerges from the literature is the role of the government in managing this resource to meet social and economic objectives and to create competition and circumvent negative externalities. Until a better mechanism is developed, it seems that governments need to assume an active role and be interactive in the process of spectrum allocation and assignment, commercialization and satisfying social consciousness issues.

Based on the literature, I examine how the government's provision of appropriate frequency spectrum for the mobile telecommunications industry, determination of the market structure, through determining number of licenses issued, and levy of spectrum license fees are influencing the mobile telecommunications industry in Japan. A successfully mobile telecommunications industry could bring Japan economic benefit, as well as social benefits, for example penetration of 3G mobile services at an affordable price could help bridging the digital divide

by enabling vast Japanese population to gain access to the Internet via mobile handset.

4.2 Discovery in this research

Spectrum is a critical resource, which under the right conditions, is a valuable asset and enabler of mobile telecommunications services. The allocation and assignment of frequency spectrum is a battlefield for mobile telecommunications providers as they must obtain spectrum license to be able to use a fundamental legal building block, radio frequency, for their business. Like all major battles there are alliances and enemies. There is a virtuous cycle between the popularity of mobile services and the allocation of more spectrums to satisfy this increasing demand. The network externalities nature of mobile telecommunications services adoption has mobilized organizations to co-operate to address the costs, risks and capture the rewards of this amplifying growth phenomenon.

The allocation, assignment and commercialization of this critical resource affects the market dynamics in terms of spectrum winners and losers and therefore creates tension between organizations and the bureaucracy which is responsible for spectrum allocation and assignment. In this environment, the government has a critical role to address the economic and social implications which affect market dynamics, created by the way the spectrum is allocated, assigned and priced.

Based on the research and literature, in my view, while the Japanese government assumed the role of allocation and assignment of frequency spectrum, determining market structure by fixing the number of licenses available to the market and designing the license fees to be borne by the service providers, they have taken a balanced view of industry development and the realization of social benefit. They created a stable environment by fixing the number of 3G license available in the market (Gruber 2001), so that licensees are protected from unanticipated market share dilution, which encouraged licensees to invest in service and business development. Furthermore, while there were 3G license fees

windfall gains by some governments overseas, the Japanese government literally gave away 3G licenses. Without mobile carriers having the burden of paying any up-front license fee, in comparison to the 3G licensees in Western Europe, the 3G licensees in Japan were in a very good financial position to develop and deploy 3G mobile services. The absence of these costs may be one of the reasons why Japan became the first country in the world to deploy 3G services. As of 2007, Japan still maintains its leadership in 3G mobile service development and deployment at a global level (Gruber 2007).

4.2.1 Existence of radio frequency spectrum as a resource

The literature review confirms the strategic nature of radio frequency spectrum as a socially constructed scarce natural resource which needs to be treated as a valuable asset that can be used to drive mobile telecommunications industry development (Bohlin, Weber & Preissl 2006; Faulhaber 2006; Gruber 2001, 2004, 2007; Melody 1980; Oniki 2006). Radio frequency spectrum is a mandatory resource which has to be used to create huge local mobile market development and potential for export generation. In addition, spectrum allocation and utilization has social and political implications which warrant the marshalling of this valuable resource to meet social and political objectives (Melody 1980).

The mobile telecommunications industry is enabled by radio frequency spectrum, which is used to build economic gain from commercial services. This "resource" is necessary and valuable to be used for satisfying human needs. All of my informants have mentioned that radio frequency spectrum is a critical resource for the mobile telecommunications industry. Mr. Ishida stressed that radio frequency supplied by the government is the most important resource in the mobile telecommunications industry:

> In the mobile telecommunications industry, the most critical resource that a carrier has to depend on the government to supply is radio frequency. The most significant policies and regulations affecting the relationships between the mobile telecommunications

> companies are also related to radio frequency. In the mobile business, volume of business depends on the volume of frequency available to be used by a carrier. So specific policies and regulation apply to radio frequency usage and allocation will affect the relationships among the mobile telecommunications companies. The allocation of radio frequency is under the control of MPHPT. Therefore, radio frequency division and land mobile communication division of the telecommunications bureau in MPHPT are the government divisions that exert the most influence on the mobile telecommunications industry. (Narrative-Ishida)

Radio frequency spectrum is often compared to land (Oniki 2006), which is a mutual exclusive resource and directly correlates to the yield, provided other conditions hold constant. In this context, a mobile carrier needs to acquire sufficient space to work on, i.e. frequency spectrum, just as a farmer needs to obtain a piece of land to start the farming process. The size of the land does matter to the output of the farmer. However, with the same size of land, a farmer could increase the associated yield by growing higher value crops, which mirrors the higher value applications services delivered through 3G mobile services. As mobile service providers are moving towards providing 3G multi-media services, frequency bandwidth is becoming more important (Faulhaber 2006) to increase services yield and facilitate new applications. Mr. Kimura explained this trend of providing value-adding applications in Japan:

> From 1999 to 2004 and beyond is the Multi-media Age, where there is increased competition. NTT Docomo changed the direction and the whole industry tried to put additional value, beyond the voice capability, into the phone and the service. For example, by embedding the finger printer authentication in mobile handsets we introduced secured access to mobile services, this allowed us to offer value-added services such as e-wallet. It was at our request, the handset maker conduct R&D in how to put finger printer authentication in a mobile handset. These value-added services

> have been the competitive engine to drive the industry for the past five years. (Narrative-Kimura)

Mr. Kimura's view is supplemented by Mr. Mori's description of the "bandwidth hungry" nature of these applications:

> In the past, the mobile handset had a small monitor and supported a slow transmission speed. However, carriers such as NTT Docomo developed new applications through i-mode, and now users can get high speed connection to the Internet through a feature-rich mobile handset. These capabilities form a basis for the consumers to use various value-added services and applications from their mobile services provider. These value-added services are bandwidth hungry and the government controls the allocation of the spectrum required to facilitate these services. (Narrative-Mori).

Mobile telecommunications carriers are competing to retain customers and to obtain higher revenue from each of the customers by offering more value-added services, such as including music download and IP TV, which are bandwidth hungry applications. The mobile telecommunications industry does not stop at 3G, as of end of 2007, the industry is undertaking long-term evolution (LTE) project to extend and modify the Universal Mobile Telecommunications System (UMTS), aiming at improving the existing UMTS, including better utilization of spectrum opportunity.

In this context, Mr. Fujino described that the nature of competition in the mobile telecommunications industry is influenced by the availability of frequency spectrum:

> I can explain by using a metaphor, how the mobile services business operates by liking it to businesses being of two tribes; one is a farming tribe and the other is a hunting tribe. The mobile services market is not a world for the hunting tribe. It is a world for the farming tribe. Because spectrum is a limited resource, and is allocated to the mobile carrier, it is comparable to being given a

> fixed size of farm land that you work on. But it does not mean that all conditions have been pre-determined, you have to be creative and do a lot of work to compete with others so that you can have a better yield. There are often factors affecting competition and how you can effectively and efficiently use the land to create or yield the product. (Narrative-Fujino)

Frequency spectrum is the pre-requisite resource for operating and competing in the mobile telecommunications industry, and the result of such operation and competition is dependent on technological, operational and business strategies implemented by the operators. Thus, frequency spectrum being allocated and assigned by the respective governments to the operators is not the end of the story, but a critical backdrop enabling the story to unfold in the industry.

4.2.2 Role of radio frequency spectrum in the mobile telecommunications industry

Frequency spectrum is a fundamental building block in the mobile telecommunications industry. Furthermore, it exerts influence on the ION relationship through at least three aspects; (1) the quality or efficiency of spectrum and availability of spectrum influence the service provision efficiency and quality of the service by the carriers, and (2), the number of frequency spectrum license in the market, which affects the structure of the market and thus the interaction between organizations which influences the competitive landscape of the industry, and (3) the price paid for frequency spectrum license affects the cost structure and financial position of the competitors, thus the balance of competitive power among mobile telecommunications carriers (Funk 2002; Gruber 2001, 2007).

4.2.2.1 Efficiency and quality of services

At the macro level, radio frequency spectrum is critical, to the mobile telecommunications industry as well as other modes of radio communications. International Telecommunications Union (ITU), an

agency of the United Nations, has dedicated effort, since 1927, to allocate frequency bands to various radio services to ensure efficiency of operation to meet the increasing demand for radio communication services. In the World Administrative Radio Conference 1992 (WARC-92), ITU decided, in consultation with and with collaboration from participated state governments authorities and industry stakeholders, which included equipment manufacturers and service operators, the frequency spectrum bands allocated for third generation mobile service. In 1999, ITU approved five radio interfaces for International Mobile Telecommunications-2000 (IMT-2000), the next-generation global standard for digital mobile telephony. IMT-2000 standards include WCDMA, CDMA2000, TD-CDMA, EDGE and DECT; these all operate in the frequency band allocated for 3G mobile by ITU. The objective of IMT-2000 standard is to harmonize the incompatible mobile systems used around the world, and to enable next-generation mobile services, such as access to online service via the Internet. This effort of frequency-based harmonization of mobile standards not only enables global mobile service roaming, but also increases economies of scale. Thus, efficiency and quality of mobile telecommunications service could be enhanced.

The ITU frequency allocation at the WARC-92 is shown below in

Figure 8. WARC-92 IMT-2000 Frequencies, and frequency allocation at the WARC-2000 is shown in Figure 9. WRC-2000 IMT-2000 Frequencies.

Figure 9 shows that Europe, China, Japan and Korea have adopted the frequency spectrum allocation in accordance with the ITU's allocation for the IMT-2000. This is an important background for subsequent adoption of IMT-2000 standards in these countries, except in China, where the government uses the Chinese developed TDS-CDMA for their 3G mobile services. The pattern of frequency spectrum allocation in the US seems to be quite different from other regions. 3G development in the US is a significant topic for research, which is not covered in this research.

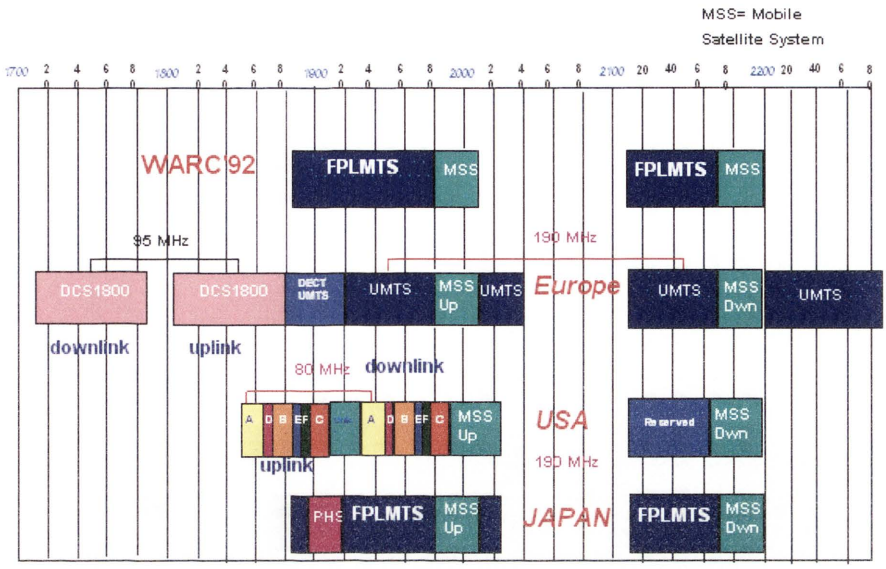

Figure 8. WARC-92 IMT-2000 Frequencies

Source: http://www.umtsworld.com/technology/frequencies.htm

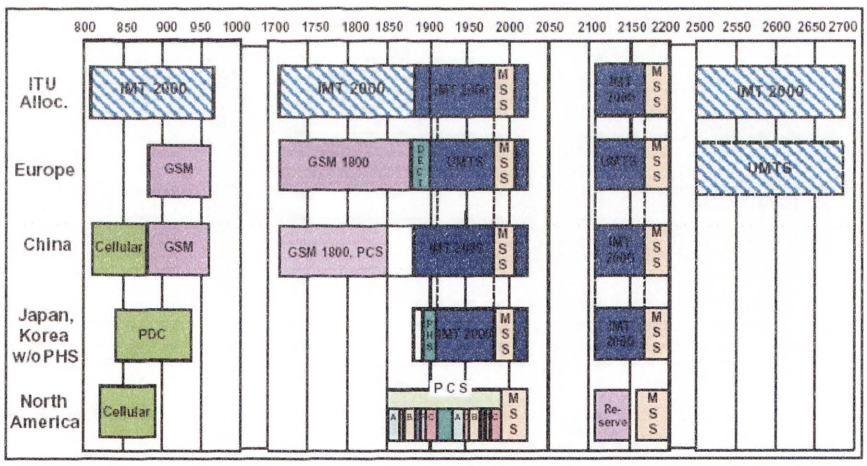

Figure 9. WRC-2000 IMT-2000 Frequencies

Source: http://www.umtsworld.com/technology/frequencies.htm

At the micro level, quality of mobile service depends on the nature of the frequency spectrum that the mobile carriers are using, for example whether their frequency spectrum is free from interference (Faulhaber 2006; Melody 1980) and the capability to provide global roaming services. Mr. Sato described that different radio frequency bands allocated and assigned to mobile carriers in Japan influence the quality of services that they provide and their ability to compete.

> I think J-Phone was doing quite well in terms of competition in the mobile services market in Japan. In terms of frequency being allocated by MPHPT, J-Phone has 1.5GHz band while NTT Docomo and KDDI au have 800MHz band. Historically, there is some technology advantage of 800MHz band over 1.5GHz for voice transmission, also the 800MHz technology had advantages over 1.5GHz in the service transparency and higher availability and performance in high density building areas, such as most cities in Japan. So, from the beginning, J-Phone had some disadvantages. However, J-Phone overcame this temporary technological disadvantage by introducing innovative value-added services such as the *sha*-mail service [15], this pioneering photo transmission service, complemented by their successful promotional campaign, attracted significant number of new customers and helped retained existing customers. This forced other mobile service operators to offer photo transmission service, and this service became a de facto application in Japan. (Narrative-Sato)

There was no international collaboration involved in development of 2G mobile standards in Japan (Funk 2002); thus, it is hard to compare the

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[15] *J-Phone is the first mobile carrier embedding a digital camera in the mobile handset and has created sha-mail service in Japan. Sha in Japanese language means photo, sha-mail is transmission of mail with photo attachment among mobile users.*

R&D involved in the development of 2G mobile service and the associated frequency spectrum allocation process. Different radio frequency bands represent a different degree or dimension of competitive advantages of mobile carriers and handset manufacturers that affect the ION dynamics within the industry. Furthermore, the quality of service is influenced by the network externalities of the chosen technology enabled by the associated frequency spectrum. Apart from the inherent properties of different frequency spectrum ranges, the mobile telecommunications technologies developed around these spectrum ranges carry their own characteristics and competitive edges. According to technology adoption theories (Arthur 1989; Katz & Shapiro 1986; Schilling 2002), a carrier's choice of the right technology, as well as the ability to obtain the required spectrum license, constitute the minimal condition of creating a success story in the mobile service industry.

As the penetration of the 3G mobile service is growing, mobile service providers are increasingly offering more "bandwidth hungry" applications, carriers require more bandwidth within the allocated frequency band (Faulhaber 2006). The availability of such bandwidth is critical to mobile carriers because mobile carriers design, purchase and rollout their network, service and handsets based on the frequency band granted to them. It is not an easy task to forecast the bandwidth hungriness of future applications and consumers. For example, YouTube, which did not exist ntil 2005, however, by mid-2007 data traffic arisen from YouTube constituted up to 7% of the Internet traffic in the US (Buckley 2008) is a good example of the non-foreseeable nature of growth in Internet traffic, which could be translated to the demand for frequency spectrum bandwidth in the mobile telecommunications industry. In the mobile industry a CEO of the largest mobile telecommunications operator, Vodafone, acknowledged that mobile internet was not considered as a serious business model, but it is now an undeniable demand trend which has to be addressed by mobile carriers (Barthold 2008). Bandwidth availability is one of any mobile carrier's critical success factors; however,

there is no proven formula to accurately project the demand driven by future mobile applications.

If there is a shortage of bandwidth and a mobile carrier is required to migrate to another radio frequency band, this mobile carrier will need to change certain equipment in their networks, develop new handsets and deploy the new handsets to their mobile service subscribers. This could be a resource intensive and financially consuming exercise to this mobile carrier. Thus it is critical for mobile carriers and other stakeholders to ensure that there is and will be relevant frequency spectrum bandwidth available to the mobile industry for long-term industry development.

The process for a mobile carrier to obtain frequency band for their preferred technology standard is a negotiation process, this goes way back to the spectrum allocation process, i.e. if a spectrum is not allocated for mobile telecommunications usage, no license will be assigned to any carriers for using such spectrum (Funk 2002). This negotiation process is not restricted to the domestic arena, due to the increasing importance of harmonization of telecommunications services at a global level, there is considerable international effort expensed by ITU, state governments and industry stakeholders to negotiate the allocate frequency spectrum for mobile telecommunications usage. These stakeholders include equipment vendor and carriers. This negotiation process is not a one-off event; rather, it is an on-going negotiation process between the bureaucrats and the stakeholders.

4.2.2.2 Number of spectrum licenses in the market

The number of spectrum licenses determines the number of players in the mobile telecommunications carriers market in Japan and market mechanisms play a role in determining the market dynamics and performance of each of the mobile telecommunications carriers in the market. According to Porter (1990) the more competitors in the market, the better is the market structure, in terms of higher level of competition in the market. However, the mobile telecommunications industry is a "natural

oligopoly" (Valletti 2003), where, regardless of market size, there are a limited number of carriers that are able to survive in the market, due to the need for significant infrastructure investment by mobile carriers. A large number of carriers in a market will lead to market consolidation where carriers exit because of unprofitable business operation or carriers merge to achieve economies of scale to sustain cost competition.

It seems that this is the case in Japan. In the early 1990s, there were more than seven mobile carriers offering mobile services in the Tokyo metropolitan area; by 2000, the number of carriers had reduced to three. Both Mr. Ishida and Mr. Fujino supported this view and claimed that such market consolidation was due to market forces:

> There is too much competition in the handset industry, but not enough competition among the mobile carriers. Ten years ago, there were more mobile carriers than today, now there are only three, Docomo, KDDI au (consider Tu-ka is operated by KDDI as well) and Vodafone. Maybe it is due to market forces rather than government induced structural change. (Narrative-Ishida)

> In the mobile industry in Japan, there were multiple. In the Tokyo metropolitan area, at the peak of the market, there were 7 carriers. Now we have only three carriers in the Tokyo areas. Because of competition some carriers are gone and some have stayed in the industry. Although competition is difficult to define, I believe that the mobile industry is one of the most competitive industries in Japan. (Narrative-Fujino)

In the early 1990s, mobile service was voice-centric and the subscriber base in Japan was quite small thus there was sufficient bandwidth for a larger number of mobile carriers offering services in the same geographic area. An exponential growth in subscriber base was not envisaged (Oniki 2006). The nature of market consolidation described by Mr. Ishida and Mr. Fujino mirrors Valletti's (2003) claim about the mobile telecommunications industry being a natural oligopoly. Due to the investment and operational

efficiency factors, only a few carriers could survive and prevail in the industry. It seems Mr. Ishida's opinion about the level of competition in the mobile carriers business is based on Porter's notion of competition, i.e. the more competitors, the better the competition. However, a low number of mobile carriers in the market does not necessarily create a non-competitive nature in the mobile industry and, despite the small number of mobile carriers in the Japanese market, Mr. Sato claimed that there is competition in the mobile market:

> If you are qualifying competition in the telecommunications market by the number of players in the industry, compared to ADSL, where there are a lot of players, there are fewer players in the mobile sector, and thus the competitive pressure in the mobile sector is not so high. However, there are other factors affecting the competitiveness in the mobile market, such as technological competition. (Narrative-Sato)

Mr. Sato ascribed to the view that the small number of players in the mobile industry does not create a non-competitive situation in Japan. He highlighted that there are other factors which create a competitive environment besides number of players. This is in agreement with Schumpeter's (1950) dynamic view of competition that an efficient market can be realized through optimal market concentration of a few players, where as a highly fragmented market could be less efficient. Schumpeter's (1950) view emphasizes that this is especially applicable when R&D driven innovation is important to an industry, where non-fragmented market and financial power will enable this industry to invest in R&D which lead to innovation. In Mr. Fujino's view, even through Japan's mobile telecommunications industry is in a controlled competition environment, i.e. the frequency spectrum bandwidth is assigned by the government and the number of players in the industry is limited by the government, there is still competition to drive the industry towards success:

> There are people saying that there is no competition in such controlled conditions. If you subscribe to the thought that competition breeds a successful industry, then the mobile service industry in Japan reflects this by being the most advanced one in the world. If you only focus on the result of competition, by definition, the Japan mobile industry is successful. I believe even though the mobile service industry is in a controlled environment, there is competition among the carriers, which leads to the successful results. (Narrative-Fujino)

Mr. Fujino focused on the performance of the industry, i.e. the innovation and 3G service rollout and penetration achieved in Japan, as indicators of Japan's success in this industry, which was bred from competition among the carriers. Thus, the small number of mobile carriers that existed in Japan did not bring about a detrimental effect on the industry.

4.2.2.3 Price of frequency spectrum license matters

When the world was optimistically embracing the 3G mobile during the late 1990s, until 2000, there was considerable 3G license allocation activity in Western Europe. In the UK and Germany, mobile telecommunications service providers paid billions of pounds up-front for licenses to use frequency spectrum partitioned by the governments for 3G mobile service. It is a well known situation that huge up-front license fees will jeopardize the licensees' balance sheet and the organizations' abilities to invest in R&D and infrastructure for the 3G mobile service whose operating rights they have won (Beardsley, Enriquez & Garcia 2004). While in countries such as Portugal and Sweden there were 'beauty contests' for 3G mobile licenses, the license fees paid by the licensees in these countries were small fractions of their counterparties in the UK and Germany (Gruber 2001). In June 2000, after years of consultation with the industry stakeholders, the Japanese government assigned three 3G mobile licenses, one to each of the then existing mobile service providers that applied for the license, with no up-front license fee being charged (Oniki

2006). These Japanese mobile service providers are required to pay a spectrum usage fee of JPY540 per subscriber per year. Until the end of 2007, the Japanese government has not issued more 3G licenses.

4.2.3 How government mobilizes frequency spectrum as a resource to achieve their objectives

There is serious criticism regarding the inefficiency of the government regime in the management and allocation of frequency spectrum and the associated licenses (Faulhaber 2006; Gruber 2001, 2007; Melody 1980). There are advocates for free trading of frequency, based on an assumption that a free trade in frequency will see radio frequency spectrum achieve the most economic value and that it will create the most efficiency (Faulhaber 2006). Regardless of these criticisms and free market theories, the Japanese government retains a command and control approach in its spectrum policy (Oniki 2006). There are three major dimensions with which the government influences the mobile telecommunications industry via frequency spectrum, (1) availability of frequency spectrum to the mobile industry (Funk 2002); (2) the number of frequency licenses made available in the market, which determines how endogenous is the market (Gruber 2001); and (3) the levy of the license fee, which affects the cost structure of the mobile business investment and the carrier's ability to develop and offer services (Funk 2002; Gruber 2001).

4.2.3.1 Availability of frequency spectrum to the mobile industry

Mr. Mori stated that the Japanese government is involved in radio spectrum management in such a way that, 'the licensing and allocation of radio spectrum are all controlled by the government.' (Narrative-Mori). Mr. Ishida from the MPHPT claimed that it is the government's objective to create a positive environment for the mobile industry, which includes the aspect of spectrum:

> MPHPT's main concern for the carrier business is to create a favorable environment for mobile services penetration. The major aspects that MPHPT focuses on are security, connectivity and spectrum. (Narrative-Ishida)

By allocating frequency to the 3G mobile service, in accordance with ITU's IMT-2000 standard, the Japanese government is steering the nation's mobile telecommunications industry to be internationally compatible. This is an effort to join the global harmonization of 3G mobile standard. The implication is that the mobile industry could enjoy better network externalities, because the relevant network is bigger; Japanese mobile service users could enjoy benefit such as international roaming; and the industry could create exportable technology. This approach is considerably different from the 2G approach in Japan. NTT Docomo dominated the development of a proprietary 2G mobile standards, PDC, thus rather than GSM or CDMA, PDC is used in Japan as the 2G technology (Funk 2002). It is obvious that the mobile operators did successfully obtained frequency spectrum from the government to run the proprietary PDC system, which is not a common standard. Mr. Ishida identified the negative effect of proprietary 2G mobile standard in Japan:

> None of the Japanese mobile handset companies is among the top mobile handset companies in the world. One of the reasons for this is the mobile technology used in Japan is not compatible with other mobile standards in the world. (Narrative-Ishida)

NTT Docomo's proprietary 2G mobile standard has driven Japan to become an island of advanced mobile technology with no international market for its advanced mobile handset. Thus, Japanese mobile handset manufacturers could not create economies of scale, which could have created benefit for the consumer in Japan.

With regard to 3G technology no one could rule out NTT Docomo's ability to create a proprietary 3G standard, if NTT Docomo did create such standard, Japan could have gone the same path as it did in the 2G mobile

era industry development. However, the government pursued NTT Docomo to either adopt an international standard or create an international standard (Funk 2002; Oniki 2006). NTT Docomo did create WCDMA in collaboration from Ericsson and Nokia. Eventually the modified version of WCDMA became one of the IMT-2000 standards. According to GSM Association, as of October 2007, there are more than 175 mobile operators in more than 60 countries offering WCDMA based services, and there are nearly 300 operators worldwide which have committed to deploying WCDMA based services. Though NTT Docomo does not have 100% ownership of WCDMA, it is exporting license for essential technology for WCDMA.

4.2.3.2 Number of licenses issued

The Japanese government has determined the number of 3G licenses to be granted to the mobile industry; through lengthy consultation with the industry stakeholders (Oniki 2006); the result is allocating three 3G license to the existing mobile carriers which applied for a 3G license, i.e. NTT Docomo, KDDI au and J-Phone. Tu-ka is a low-cost operator under the umbrella of KDDI au, which did not apply for a license. Mr. Fujino highlighted the government's involvement in the mobile license allocation process and this contributes to creating a better base and potential for the development of mobile telecommunications services in Japan:

> The Japanese government gave away the 3G license to only NTT Docomo, KDDI au and J-Phone. By doing this they (the government) did control competition. The spectrum allocated to each of the three mobile carriers here is wider than those obtained by overseas carriers. That means carriers in Japan can offer higher speed services with better quality. (Narrative-Fujino)

Radio frequency spectrum is a finite resource. Furthermore, only certain frequency spectrums have been allocated to mobile telecommunications. If bandwidth is equally assigned to all eligible mobile telecommunications carriers, the more eligible mobile carriers there are, the less bandwidth

each of them are getting. When there are a smaller number of carriers dividing the available radio frequency spectrum, theoretically, they will all get more bandwidth which will enable them to create and provide more value-added services to their customers. According to Mr. Fujino, this is what happened in Japan.

Mr. Fujino believed that three mobile carriers is the optimal condition for the Japanese mobile market:

> Competition is a difficult situation to consider. In general, the majority of people say that in terms of the competition environment, the more intensive/severe it is, the better it is. My assumption is that in mobile business it is different; you need to invest a lot of money in infrastructure to become a viable mobile services provider. There are 3 carriers now. If there is a 4th and/or 5th entrant, they will think that they are going to be the winner. They would forecast higher market share than the one they will get. For example, 100% capacity is the most desirable and they might over-build capacity. The more carriers, the situation might be worse. And more capacity might be over-built. If the government intervened and increased the number of carriers the situation might be worse. (Narrative-Fujino)

Mr. Fujino's view reflects the reality of the mobile telecommunications carrier's business environment, where a huge investment is required in the fixed assets, to support the forecasted required capacity.

As Gruber (2001) highlighted it is importance for the government to maintain a stable environment in the mobile industry, in terms of the number of licenses in the market. Mr. Suzuki supported this by observing that the Japanese government will not lightly increase the number of licenses:

> There are five factors determining the competition environment in the mobile services sector..... Fifth is the entrance of new players. Initially, NTT Docomo was the monopoly in the mobile service

> sector; but now in addition to NTT Docomo, there are au, Tu-ka and Vodafone in this market. Due to the limited availability of radio spectrum, the earliest time another player, Softbank, can join the mobile telecommunications sector is in 2006. (Narrative-Suzuki)

Softbank, which created an unconventional successful story in the broadband internet industry in Japan, had been trying to pursue the Japanese government to issue a mobile carrier license to it (Oniki 2006). In Japan, Softbank is well-known for using unconventional methods to coerce its counterparties in the industry; however, the MPHPT did not issue an extra license for Softbank to start a mobile carrier. However, in 2005, Softbank bought Vodafone's operation in Japan, thus it is now running a mobile operator in Japan.

4.2.3.3 Levy of license fee

The Japanese government did not follow the then popular method of allocating 3G licenses by auction. It did not impose an up-front financial burden to 3G carriers; instead the Japanese government levies license fees through an annual spectrum user fee according to the number of mobile telecommunications subscribers, at the rate of JPY 540 per year (Funk 2002; Oniki 2006) for each subscriber. This is in accordance with the Radio Law (Srivastava 2003) and is applicable to 2G service. Therefore there is no "exogenous sunk cost" (Gruber 2001) from the point of view of up-front license fees in Japan. This approach of pay-as-you-have subscriber enables mobile carriers to have this cost as a variable cost, without adding burden of finance cost to pay the up-front license fee. Mr. Sato pointed out the potential to negate competition through the frequency auction process which provides justification for MPHPT's approach:

> In Japan, in terms of 3G, MPHPT allocates the frequency, which is different from Europe, where the government auctions the frequency. I think the auction system kills competition because only

> the companies which can afford the frequency can get into the business. (Narrative-Sato)

A high license fee is not only a barrier to entering the market (Gruber 2001) but also deprives mobile carriers of the financial capability for R&D. It does not cost firms to have innovative ideas or to be creative; however, it does cost money to turn an innovative idea into a product which is ready to be used and marketed.

In summary, Japan is the most advanced mobile market in the world and mobile service providers in this market have no financial burden through the auctioning of 3G licenses (Bohlin, Weber & Preissl 2006).

4.3 Summary of data analysis on frequency spectrum

Frequency spectrum is one of the fundamental building blocks which enable mobile telecommunications services, as well as a determining factor of the choice of transmission technology standard which could be chosen by mobile telecommunications carriers. The Japanese government mobilized this resource in favor of the industry in three ways, (1) make the frequency spectrum appropriate for the UMTS transmission technology, available in Japan, (2) make appropriate number of licenses available, (3) creating an industry supporting licensing arrangement, where there is a levy based on the number of subscribers that a carrier has, which is a variable cost paid on an annual basis, instead of a huge up-front cost which will cripple a carrier's financial position.

Chapter Eight – Making sense of the research

1. Making sense of the research

As the analysis unfolded, a story emerged, one constructed from the individual narratives of major actors in the arena of 3G as well from the drawing in of various social science resources, (Brunsson 2000; Johnson 1982; Katz & Shapiro 1985; 1978; Schaede 1995; Schilling 1998, 2000). The story enables me to address the research question: to what extent is the Japanese government able to steer the nation's economy in the digital age?.

As I sought to interpret the data that I had collected, it became obvious that by applying the sensemaking perspective (Weick 1995) I could construct an account of how and why the Japanese government and the industry stakeholders' input had contributed to the industry development of the mobile industry. To make sense of Japanese government involvement in the mobile telecommunications industry development and how this affects ION in this industry, I created scenarios depicting low to high government involvement and applied these scenarios to the three focal resources identified in this research. Through these scenarios, the reader can gain understanding of different types of government involvement and the relationship to competition and the underlying dynamics of ION.

In this section I will attend to the sensemaking process (Weick 1995) involved in the industry development of the mobile telecommunications industry, as I have defined it within the scope of this research. In this context, sensemaking is both a methodology for analysis and the object of the analysis; an approach that is parallel to the research approach of Blatt et al. (2006) on reliability in the medical industry.

In 'A sensemaking lens on reliability', Blatt et al. (2006) used sensemaking as the method of inquiry which serves as a lens enabling them to focus on human agency, equivocality and relationships. This method directed their

attention on agency, because action is made up of people's effort to make sense; on equivocality, because people's need to comprehend the flow of uncertainties, which triggers sensemaking; and on relationships, because sensemaking is social (Weick 1995). Blatt et al. made sense of the sensemaking process experienced by a sample of medical residents around lapses in reliability of patient care.

In my research, I use sensemaking as a method of inquiry which enables understanding of the issues and relationships involved in the government involvement in the mobile telecommunications industry development. Issues studied in this research, such as technology standards and frequency spectrum allocation and assignment, are critical decision-making points which the government and the industry stakeholders have to traverse through communication and action, involving embedded relationships (Granovetter 1985). *Amakudari* plays a crucial role in this interorganizational relationship, i.e. among the government and the mobile telecommunications industry stakeholders. *Amakudari* is an instrument to facilitate interactions and interpret the processes and actions. I make sense of the sensemaking process by examining *amakudari* in the context of the extent to which the government was involved in the mobile telecommunications industry and how it was influencing the outcomes in this industry.

As a result of the work done in this research I have identified that the direction taken by the 3G mobile telecommunications industry in Japan was the effect of conscious decisions rather than being a wholly random phenomenon. The direction achieved seems to be a constructed process created by concerted effort from various stakeholders, involving actions such as communication, negotiation and forecasting, and cognitive consideration, the combination of which generated decision-making. This process consisted of interaction between action and thought, the core element of sensemaking (Weick 1995, 2008) Weick's (1995) sensemaking process is manifested in the process of government and industry

stakeholders' interactions related to the mobilization of the resources of *amakudari,* technology standard and frequency spectrum.

In this chapter I will first re-introduce the background of the mobile telecommunications industry and the theoretical framework of this research. Then, I will outline the conceptualized relationship of government involvement, and competition, with the underlying ION dynamics, as they emerged from analysis of the data, with reference to the literature review, followed by scenarios derived from data analysis that explore the properties of the focal resources and government involvement, and will subsequently draw conclusions.

2. Background and framework

Traditionally, telecommunications is a highly regulated industry, one which has implication for a nation's security, social advancement and wider industry development. Recently the business has evolved from landline to digital mobile technologies. The business approaches of mobile providers are somewhat different from those of purely landline providers, many of whom were once state instrumentalities. Whether directly or indirectly, however, the state has a profound impact on private sector mobile providers. International negotiations by the government will affect the domestic mobile carriers' business dynamics; for instance, the Japanese government is required to participate in ITU's World Radio Conference (WRC) for international level decisions on radio frequency spectrum allocation and technical standards which enables equipment to interoperate (Gruber 2005). The WRC involves a negotiation process between participating government authorities and industry stakeholders, as well as among the latter. Government's participation in such decision-making is inevitable, and its results can, and often do, influence domestic dynamics based on how these issues have been resolved.

The mobile telecommunications industry in Japan is still government regulated, and is one in which efficient and effective communication

between the regulating government bureaucrats and the industry stakeholders seems to be critical to the development of the industry. Timely and effective communication concerning decisions critical to the industry is a crucial issue in negotiations between bureaucrats and mobile carriers. For instance, the decision of which technology is to be chosen by the carriers is dependent on the frequency spectrum specification, and the frequency spectrum specification chosen can determine the type of technology to be used. The technology/spectrum decision subsequently influences the development of the nature of carriers' substantial investment and business strategy and thus the business dynamics and competition that occurs in the industry. Network externalities of the chosen technology standard exert deep and wide influences over mobile telecommunications carriers' business models and cost and quality of services and equipment.

In this section, I use a diagrammatical analysis to explain the pattern underlying the ways in which the Japanese government influences competition in the mobile telecommunications industry. Competition is a dimension of ION relationship in the industry (Benson 1975). Competition facilitates industry development seen through various indicators, such as social benefit, innovation (Schumpeter 1950), better product/service quality and export potential (Porter, Takeuchi & Sakakibara 2000). The government has an impact on ION through influencing the resource allocation among the mobile carriers which, in turn, affects the relative positions of each of the mobile carriers in the ION as well as their competitive dynamics (Benson 1975; Pfeffer & Salancik 1978). Therefore, it is possible to gauge the overall competitive position by looking at the government involvement and its associated impact on the ION.

An underlying mechanism structuring ION relations is the government involvement in the allocation of key resources required by the industry. Seen through the lens of the ION theoretical framework (Benson 1975) that I have used in this research, as illustrated in Figure 10 below, the Japanese government is a key actor in the mobile telecommunications

industry as can be seen by the influence it exerts over the ION relationship among the mobile carriers in Japan. The ION relationship among the carriers is indicated through the power balance and/or the dynamics of competitive advantage among the carriers, as changes occur in the level of government involvement.

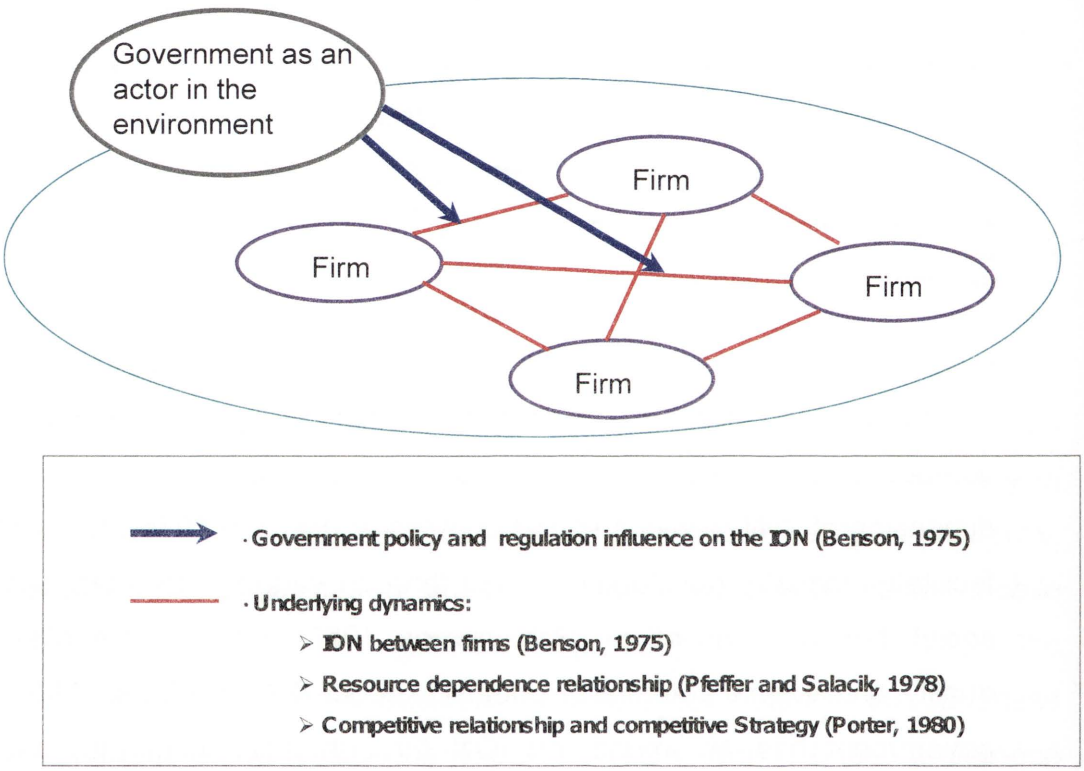

Figure 10. Theoretical Framework

3. The conceptualized relationship between government involvement and level of competition

The relationship between government involvement and competition can be conceptualized, theoretically, as a bell-shaped curve, as shown in Figure 11.

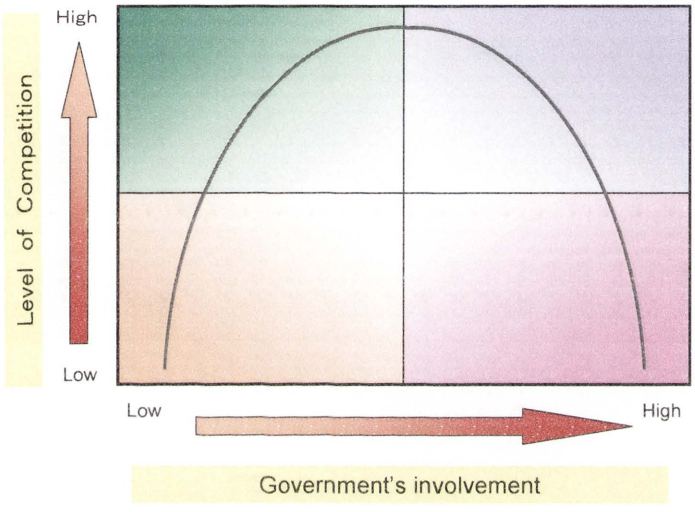

Figure 11. Hypothetical bell-shaped relationship between government involvement and competition

In the following introduction I provide a general understanding of what is indicated by this bell-shaped graph, followed by the scenarios section which provides detailed explanation of the rationale behind the relationship of government involvement and competition level.

The bell-shaped curve represents the pattern of relationship between government involvement and the level of competition in the mobile telecommunications industry in Japan. As depicted in Figure 11, in the mobile telecommunications industry, both low and high levels of government involvement will lead to low levels of competition; when there is an optimal level of government involvement, the industry can achieve high level of competition. Where there are no other influences, we can represent relations with a bell-shaped curve; however, this curve may be skewed when factors such as more stringent government control of mobile

telecommunications due to terrorist activities monitoring requirement, are considered.

I focus on three scenarios of government involvement and level of competition as highlighted in Figure 12. The levels of government involvement and the relationship to competition in the mobile industry in Japan are represented as relative aspects of reality rather than as quantitative indicators determined by mathematical measures.

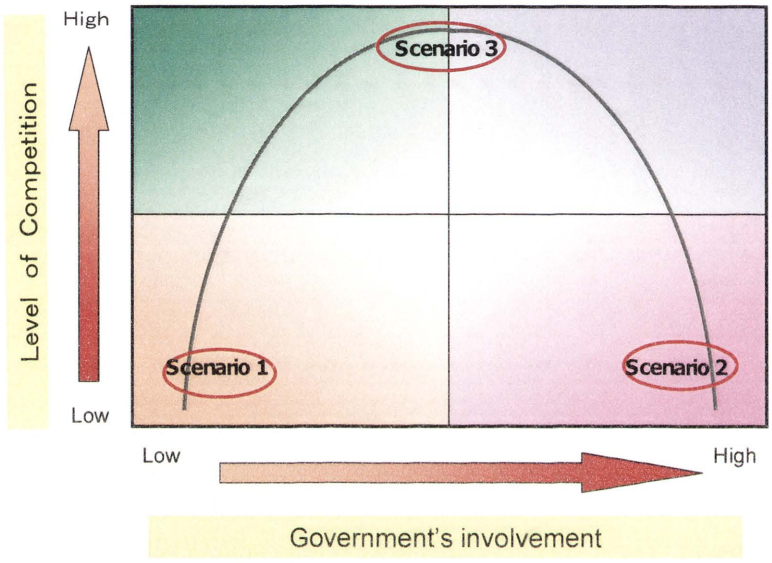

Figure 12. Scenario of government involvement

The scenarios depict three ideal type representations (Weber 1949) that are outlined in detail below. Briefly, Scenario 1 depicts a scene where low government involvement leads to low level of competition; Scenario 2, depicts a scene where a high level of government involvement leads to low level of competition, and Scenario 3 depicts a scene in which optimal government involvement leads to optimal level of competition.

The diagram is meant to facilitate analysis rather than provide an absolute positioning of the relationships. Scenario 3, as showed in Figure 13 and Figure 14 below, represent the optimal level of government involvement in the industry; this position is determined by the performance of the industry, such as the industry's innovation, service quality, and profitability.

Scenario 3 could occur towards either the low or high level of government involvement. The government's determination of its involvement in the industry is not a one-off and static decision; rather, it is a circular interactive process in which the government plays a part in constructing the environment in which the industry operates. It makes sense of the environment and dynamics of the industry stakeholders and the industry development process. Government continues to make sense of the industry upon whose sense it continues to act.

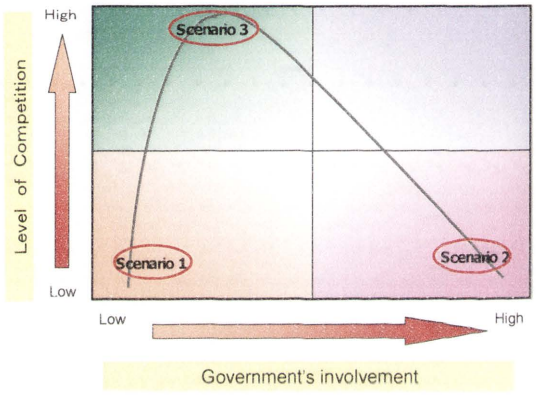

Figure 13. Scenario 3 in top left quadrant

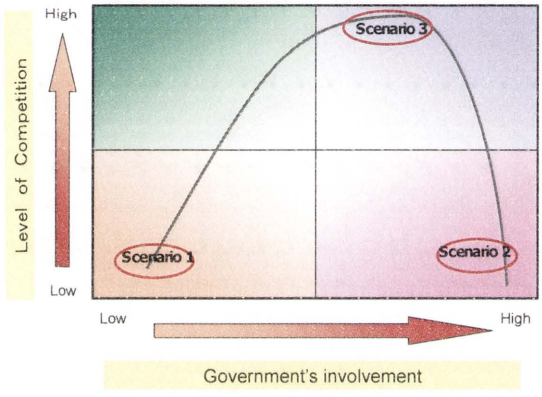

Figure 14. Scenario 3 in top right quadrant

In this research, I focus on three resources in the mobile telecommunications industry that I have analyzed under my research microscope, i.e. *amakudari*, technology standard, and frequency spectrum. These resources emerged from my data as the critical factors affecting ION and competition; therefore, they naturally fit the situation of this research, emerging in a grounded manner (Glaser & Strauss 1967). The scope of the competition dynamics in this discussion will be restricted to areas related to these three resources. There are other factors and resources which affect the level of competition in the mobile telecommunications industry; for example, interconnection charge and

mobile number portability; however they are not covered in this research, as no single inquiry can be utterly exhaustive.

The Japanese government has different dimensions of involvement in the focal resources of *amakudari*, technology standard and frequency spectrum, which influence the dynamics of these resources among the mobile carriers. Therefore, I will first discuss the three resources studied in my research separately by using these three scenarios in the light of ION relationships, and then I will discuss the inter-working of these resources, and the influence on the mobile carriers and the involvement of the government in Japan.

4. The Scenarios

4.1 The Resource – Amakudari

Amakudari is an institution embedded in Japanese business culture (Johnson 1982; Schaede 1995). This embeddedness exerts influence on the economic activity and results of industry, through on-going social relations (Granovetter 1985). *Amakudari* entails a close network of relationship among *amakudari* ex-bureaucrats as well as with current bureaucrats. The embedded institution of *amakudari* is a resource both to the government and the industry and provides for direct communication between the parties. In this connection, the government and the industry can make sense of their counterpart's sensemaking process (Weick 1995). *Amakudari* is part of the mechanism that enacts government involvement in the mobile telecommunications industry.

Amakudari allows industry to understand, participate and make sense of the process of government decision-making. Industry uses *amakudari* to help with its understanding of government processes and combines this understanding with their own experiences and internal sensemaking. Through *amakudari*, firms in the industry gain access to critical resources

for their business and develop an understanding of government deliberation processes regarding technology standards and frequency spectrum allocation and assignment. This relationship is illustrated in Figure 15 below.

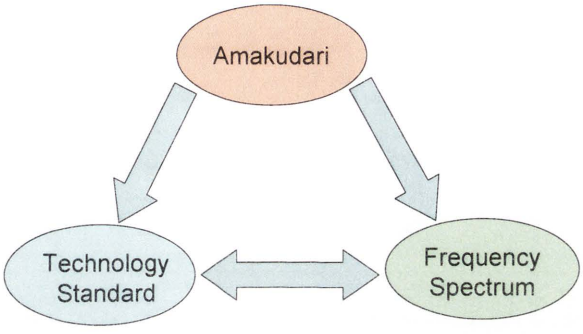

Figure 15. Relationship of the amakudari, technology standard and frequency spectrum

There are interconnecting relationships among the three resources under discussion. Technology standard and frequency spectrum have an interactive relationship, as choice of technology standard by mobile carriers is dependent on the frequency spectrum available to them. Government's decision-making on frequency spectrum to be made available to carriers is made in the context of a consideration of viable technology standards and international frequency allocation. *Amakudari* plays a role in the sensemaking processes entailed in this decision-making. In Japan, there is an interconnecting relationship between the focal resources in this research, influencing ION and affecting industry competition.

4.1.1 Amakudari – Scenario 1

When there is no or a very low level of *amakudari* in the mobile telecommunications industry, what will happen?

Government deliberation processes normally take place for several years prior to final decision-making. If mobile carriers cannot be involved in these deliberations they will not be part of the decision creation process and will

find it difficult to make sense of the decision. Carriers that are excluded from this process will lag in their business actions, in terms of business planning and investment; therefore, involvement in the process is critical for understanding the medium to long-term direction that the government has for the mobile industry, an infrastructure intensive industry, and is required for mobile carrier's investment and competition strategy planning and action. If government has no channel to collect market and business information about mobile telecommunications, in an industry with fast-paced technological innovation and development, the government might not be able to construct informed decisions about steering in the best interests of the nation and the industry as a whole. *Amakudari* serves as an agent to enact government's and industry stakeholders' objectives, and represents a resource to both the government and the industry stakeholders. A low level of *amakudari* represents a condition where there will be little information and knowledge about the deliberation process of the government available to the ION. In this scenario, a low level of government involvement, through amakudari, leads to firms having to rely on their internal sensemaking without knowing the government's sensemaking process. Such a separation from insight into government policy will be detrimental to the competition environment because, without knowing the medium or long-term direction that the government has for the industry, a firm may diverge from such direction.

In the mobile industry in Japan, if the carriers cannot maintain frequent effective communication with the government bureaucrats, this lack of communication constructs a barrier which could slow down their investment in developing their business. Generally, the mobile telecommunications industry involves heavy investment in infrastructure and R&D spending on product and services. In Japan, business development processes involve the carriers' attempting to mobilize handset manufacturers to produce the required handset with specifications which enable them to differentiate their services and compete. Carrier's

early and continuous involvement in the government deliberation process is thus highly important and *amakudari* is a critical enabler.

4.1.2 Amakudari – Scenario 2

When there is an excessive level of *amakudari* in the mobile telecommunications industry, what will happen?

An excessive level of *amakudari* represents a situation where mobile carriers' corporate decision-makings are originated by *amakudari* ex-bureaucrats, i.e. the government dominates in the industry decision-making. Such over-influence creates redundant thinking between government and industry, which may affect innovation, because the flow of new information into the network of decision-makers and the generation of novel ideas which could lead to innovation, are impeded (Burt 1992). In this scenario, government dictates decision-making onto the industry, such that the government's sensemaking process outweighs the firms' internal sensemaking; in such a situation this single source sensemaking may not represent the optimal answer for the industry. A high level of government involvement through *amakudari* represents a condition where there will be little information and knowledge about the needs and requirements of the relevant firms considered by the government, which can lead to a condition where these firms cannot obtain critical resources such as frequency spectrum and so not be able to use their desired, technology standard, based on preferred frequency spectrum as a base for a competitive advantage.

4.1.3 Amakudari – Scenario 3

When there is an optimum level of *amakudari* in the mobile telecommunications industry, what will happen?

When there is an optimal level of government involvement in terms of amakudari, communication between government bureaucrats and the mobile carriers will generate an environment in which carriers have the confidence to invest in infrastructure and R&D, which leads to competition,

accelerated service penetration and innovation. When this situation occurs, *amakudari* generates functional communication between the government and the mobile carriers; such communication is bilateral, i.e. mobile carriers are able to have an effective communication channel to the government, and they can obtain timely communication not just about the decision-result but also the decision making process that the government followed in an effective and efficient manner. Government is also able to obtain information about the business, market and technological trends from the carriers, in a timely and efficient manner and make sense of these inputs for their decision creation process. If a carrier is able to understand and provide input to the government's direction and decisions for the mobile industry, by providing technology, market and business information to the government in a timely manner, government bureaucrats are able to make informed decisions about the industry. Thus, when there is an appropriate level of *amakudari*, there will be optimal collaboration between government and the private sector, which will generate industry development and facilitate a comprehensive level of understanding and information leading to optimal competition in the mobile telecommunications industry. In this scenario, industry stakeholders understand government's sensemaking, and vice versa, and thus there will be a balanced input of sensemaking for the industry, where government's sensible direction and guideline will create a competition environment for the industry.

4.2 The Resource – Technology Standard

Government involvement in the technology standard of the telecommunications industry is designed, first of all, to enable technical communication beyond the incumbent carrier and other carriers. In general, the early stages of the telecommunications industry in a country is a natural monopoly, where the fixed line network is usually funded and built by government agency and run by government controlled telecommunications carrier (Gruber 2005). As competition is introduced, the government sponsored incumbent carrier can develop their technology

standard and devise ways to impede standards disclosure and therefore preclude potential carriers from gaining understanding about the government sponsored incumbent carrier's standard specification; this has the effect of excluding potential competitors from operations because building a new network involves huge investment, which implies high risk. Knowledge and know-how about the building of a technically and commercially viable network is fundamental to making sensible infrastructure investment decisions. In most countries, the incumbent fixed line operator, which is or has recently been government owned, or has some form of government control, will also be a mobile carrier.

4.2.1 Technology Standard – Scenario 1

When there is no or a very low level of government involvement in technology standard in the mobile telecommunications industry, what will happen?

In industries where major market players are pursuing open systems and open standards, an absence of government intervention is perfect for nurturing a competitive market, where industry players are able to compete on equal terms. However, the mobile telecommunications industry attracts a different regime because of the social, political and essential nature of its services to the nation.

In the mobile telecommunications industry, when government involvement in the arena of technology standard is low or absent, the incumbent carrier, which usually has market dominance, can select and/or build technology which precludes other carriers from being interoperable with its equipment and services, and therefore retard competition. The situation of incumbent carrier dominance through standards setting, if unabated by the government, would be a continuous source of investment deterrent for potential alternate carriers. For example, NTT Docomo created the 2G PDC standard in Japan, and pushed this service throughout the country and established PDC as the dominant 2G mobile technology standard in Japan. The Japanese government was not seen as an active participant in

this standard setting process (Funk 2002). In this scenario, the dominant player(s) create(s) a situation where they control the technology standard and the bias in access to this resource, which is focused in a few organizations, makes the ION imbalanced, often to such an extent that competition can be retarded. In this situation there is an extremely uneven power distribution among the players in the ION; the player with control of the technology standard will have much higher power among the related network of firms. Therefore, this kind of low government involvement creates a low level of competition.

4.2.2 Technology Standard – Scenario 2

What will happen when the technology standard setting is dominated by the government?

In the mobile telecommunications industry, if the technology standard setting is dominated by the government, there is a technology adherence in the industry; however, the industry could be facing the risk of committing to a non-optimal technology (Katz & Shapiro 1986). A government might not have sufficiently informative input for their decision making regarding the market, technology, and business trends, which could lead to longer term inappropriate decision-making. For example, China's implementation of a locally created mobile telecommunications transmission technology standard, TDS-CDMA is a case in point. China's government had the ambition to have TDS-CDMA based 3G mobile services firmly established before the 2008 Olympic Games (Wang 2007). However, this ambition has not yet been realized due to delays in the development of TDS-CDMA technology. Since the government-sponsored technology standard is not ready, the government has delayed issuing licenses for 3G mobiles based on other established technologies, such as WCDMA and CDMA2000 (Heng 2008). Thus, 3G mobile services are extremely restricted in China, and therefore there is subdued environment for competition.

In this scenario, the government is an active participant in controlling technology standards and there is little power distributed in the ION to the

extent that competition is retarded. In this situation, the mobile carriers have no control over their choice of technology standard. The implication is that they have no real control over the timing of 3G service deployment, as they have to embrace a particular technology and cannot choose an existing alternate technology until the government-mandated technology is ready. Therefore, this kind of high government involvement creates a low level of competition.

4.2.3 Technology Standard – Scenario 3

What will happen when the technology standard setting has an optimal level of involvement by the government?

If there is government and industry stakeholder collaboration to create a direction for mobile telecommunications industry development, which embrace issues such as network externalities and global service harmonization, there will be alignment between the government and the stakeholders. In this situation, the choice of technology standard will take into consideration the needs of the stakeholders, the market and the government's social, economical and political objectives. For example, WCDMA is a creation of the collaboration between Japanese carrier, NTT Docomo and European mobile equipment suppliers, Ericsson and Nokia. The European suppliers, Japanese carrier and Japanese government have pushed WCDMA as the UMTS 3G standard in ITU. WCDMA is an open standard with technical specification available to industry players and therefore the power balance in the ION in this respect is balanced; it provides a platform for development of applications which fosters real and constructive competition.

4.3 The Resource – Frequency Spectrum

Frequency spectrum is a finite and crucial resource, which is fundamental to the development of the mobile telecommunications industry. Due to necessity, the allocation of this vital resource is administrated by governments. Government involvement exists in two tiers: the frequency

spectrum allocation, and frequency spectrum assignment, which is allocated by license. The government is invariably responsible for frequency spectrum allocation because first, the overall frequency spectrum allocation has to be aligned with international requirements, and second, frequency spectrum is a national asset with many stakeholders, including mobile carriers, TV broadcaster, aviation control authority and military. Government involvement in the frequency spectrum assignment can span from strong control to weak involvement, which could affect the competitive dynamics in the mobile telecommunications industry.

4.3.1 Frequency Spectrum – Scenario 1

When there is no or a very low level of government involvement in frequency spectrum license assignment in the mobile telecommunications industry, what will happen?

In this scenario, a government has low control over the frequency spectrum license assignment and pricing of such licenses. This could occur if, for example, a government assigns licenses through auctioning them. The licensees have the right to sell or subdivide the assigned frequency spectrum. When a licensee could sell or subdivide, there are at least two implications (1) a carrier with substantial financial resource can dominate the market by purchasing copious amount of frequency spectrum, and (2) the licensee could subdivide the obtained frequency spectrum into small blocks, which are purchased by many carriers, so that the market can become crowded and not efficient.

Carriers able to buy more bandwidth will become more competitive; the implication is that carriers with superior financial positions will be in a more advantageous position in the competitive landscape. Thus, the carrier with the best financial position could drive away competition through purchasing excessive bandwidth to make it difficult for competitors to expand their business, or make it difficult for them to grow their business to the next generation of service provision because of a lack of frequency spectrum. The carrier with the best financial position could absorb the

essential resource of frequency spectrum which, by dominating this critical resource, will cause an imbalance in the ION and stop its competitors from expanding their business.

When frequency spectrum could be subdivided by a licensee, unplanned usage of radio spectrum might result in excessive service quality issues due to interference, which exists as part of the nature of radio frequency, resulting in an overall inefficiency of radio frequency usage in a country. The market structure of the mobile telecommunications industry could become unpredictable and this could be a discouraging risk factor for mobile carriers to invest in product innovation.

When a license is assigned to mobile carriers through market oriented mechanisms, such as an auction, unrealistic market expectations can drive the license price to an economically non-viable level, restricting the number of players. Carriers who have purchased such licenses are saddled with unrealistic financial burdens which lessen their financial ability to build infrastructure and rollout services. In such a situation, the licensing government essentially procures financial power from the firms in the ION of the mobile telecommunications industry, thus weakening the competitive environment in the market.

4.3.2 Frequency Spectrum – Scenario 2

What will happen when the frequency spectrum license assignment setting is dominated by the government?

When a government has strong influence, it can dictate the frequency spectrum assignment, control the price and determine the number of players without considering input from the industry. The 3G license assignment approach in China provides an example of this scenario. In China, the government exercises control over the frequency spectrum assignment and the timing of such assignment, to such an extent that when its sponsored technology, TDS-CDMA, was not ready, it did not assign any 3G spectrum licenses for commercial rollout. In this situation,

frequency spectrum is not available to the industry, thus the firms in the ION cannot commence 3G business because there is no base to create a business and therefore no grounds for competition.

4.3.3 Frequency Spectrum – Scenario 3

What will happen when the frequency spectrum license assignment setting has an optimal level of involvement by the government?

In this scenario, a government is active in frequency spectrum assignment, to create a balanced approach in appreciation of market trends, international industry development direction and domestic market dynamics, in consultation with the industry stakeholders. The mobile telecommunications industry is a natural oligopoly (Valletti 2003), where only a few carriers can survive and operate in the market in equilibrium independently of the market size. In this condition, there could be economies of scale for each of the few carriers, because there will be sufficient financial resource, and frequency spectrum in the ION.

In this scenario, the government creates an optimum condition for competition by releasing appropriate mobile service development blocks of frequency spectrum at a commercially viable price, by its decisions on nationwide frequency spectrum availability, and through a timeframe conducive to the service-rollout for a planned number of players in the industry. Such involvement from the government should contrive to facilitate mobile service implementation, innovation and the building of a strong industry for export opportunity, to take advantage of global level network externalities.

4.4 Summary of scenarios

The Table of Scenarios, Table 2. below provides the summary illustration of certain aspects of government and industry stakeholder's involvement in three scenarios. These scenarios show various degrees of government involvement which affect the level of communication between the government and the industry stakeholders, also affect the ION in the industry, and thus the nature of competition in the industry. The level of competition is dependent on the level of government involvement in the industry and is vital to achieving an optimal mobile market result.

Table 2. Table of scenarios

Factors: • resource • phenomena • rationale	Scenario 1 **Low government involvement,** **low level of competition**	Scenario 2 **High government involvement,** **low level of competition**	Scenario 3 **Optimal government involvement,** **optimal level of competition**
Resource			
Amakudari	Incumbent carrier makes decisions on industry development direction to address self-interest without concern for government's objectives	Government dominates decision-making for the industry without sufficiently considering the needs and requirements of the firms in the industry	Government makes decisions based on balanced sensemaking with input from domestic and international stakeholders
Technology Standard	Dominant player controls proprietary technology standards	Government mandates technology standards, regardless of the commercial reality of any such standard	Decision on technology standards is based on consultation between government and industry stakeholders, facilitating communication and competition
Frequency spectrum	Unpredictable number of carriers and price of licenses	Assignment of licenses is held back, regardless of voices from the industry stakeholders	Balanced view of market trend, international development direction and domestic market dynamics
Phenomena			
Effect on ION	Power in the ION is biased towards the incumbent carrier Power in the ION is biased towards the technology owner	Power in the ION is biased towards the government	Power is distributed between the government and the industry ION, and among the ION Power in terms of knowledge increased due to local and international industry exposure

Factors: • resource • phenomena • rationale	Scenario 1 **Low government involvement, low level of competition**	Scenario 2 **High government involvement, low level of competition**	Scenario 3 **Optimal government involvement, optimal level of competition**
Level of competition	Technology owner dominant in the market Too many player with no economies of scale Low level of competition because of extreme condition in terms of number of players in the industry	The industry development is crippled by government's one-sided non-commercially sensitive decision-making Industry is held back by lack of transparency and timely release of license Low level of competition because of extreme government control and absent of market forces	Competitive environment is matured based on social, economical and political imperatives. Business environment enables competition level which drives industry development
Industry development	Low level of industry development because of low level of competition	Low level of industry development because firms are in an environment where they cannot optimize and innovate at their discretion	Optimal level of industry development based on healthy and commercially viable competition environment
Rationale			
Sensemaking	Dominance of carrier's Internal sensemaking	Dominance of government's internal Sensemaking	Balanced carriers' and government's sensemaking

The summary table distills the findings and understanding gained from the research, literature, field work and data analysis, in terms of the relationship between government involvement, ION, competition and industry development, and the role of sensemaking, to explain to what extent the Japanese government steers the mobile industry development in the digital age. This table clearly illustrates that communication

contributes to the balance of resources and power within the ION, influenced by the level and nature of government involvement. It is apparent that an appropriate level of government involvement is not only key to industry development but mandatory to foster a successful domestic and international industry. Clearly, the social factors of *amakudari* and obligation to the nation, as well as the politics involved in using technology standard and frequency spectrum as tools to gain political advantage, achieve economic growth and meet social obligations are critical for the mobile industry.

5. Addressing the hypotheses

This section addresses the hypotheses which were set out in the early stage of the research.

Hypothesis 1a: The Japanese government intended to enhance the industrial performance of the mobile telecommunications industry through direct intervention. This hypothesis is based on Johnson's (1982) model.

This research shows that the Japanese government exerted direct and subtle influence in the mobile telecommunications industry, through technology standard and frequency spectrum availability. The Japanese government did not mandate what technology standard should be used, rather, they set the framework of using or creating internationally compatible technology standard and allocated frequency spectrum in accordance with the ITU spectrum allocation plan. These influences exerted by the Japanese government are intended to ensure that the Japanese mobile telecommunications industry will not be technologically isolated from the rest of the world as compared with the 2G regime. In the 2G regime, Japanese mobile technology was very advanced and the handset was superior to its overseas counterparties, in terms of weight and functionality. However, due to the peculiar technology standard used in Japan, there was no export market for Japanese equipment and

handsets, thus limited network externalities and economies of scales could be gained by the industry.

Hypothesis 1b: The Japanese government's direct intervention in the mobile telecommunications industry would affect the resource dependence relationship within the ION, and would have a positive effect on the industrial performance. This hypothesis is based on Johnson's (1982) model.

The research confirms that the government's influence over the mobile telecommunications industry affected the resource dependence within the industry. The Japanese government ensured that there is no proprietary technology to be developed and used by the incumbent carrier for 3G mobile, i.e. an open and international standard is developed and/or used by the carrier.

Adoption of open international 3G standards by the mobile carriers in Japan, i.e. WCDMA and CDMA, enables these carriers, equipment manufacturers and handset manufactures to benefit from expanding international business for these open standard products and services. The Japanese government influenced the conduit of information, through mobilizing *amakudari* in the mobile telecommunications industry to achieve the creation and adoption of an international 3G standard. There is a positive effect on the industry development because communications bring valuable understanding and insight in government's deliberation and direction in frequency spectrum allocation and assignment, further, adoption of open international standard enables economies of scales and network externalities.

Hypothesis 2: The Japanese government would indirectly influence or intervene in the industry to enhance industrial performance through enhancing domestic market conditions, providing access to supporting industry, factor/input condition and context for firm's strategy and rivalry, to create a competitive environment. This hypothesis is based on Porter et al.'s (2000) claim.

The research confirms that the Japanese government did exert indirect influence to create a competitive environment. The government mobile carriers frequency spectrum usage charge is a variable cost to the carrier, instead of a huge up-front sunk cost. This measure created a level playing field for mobile carriers, thus the domestic market condition is enhanced through lower variable cost to the mobile carriers, which theoretically will lead to lower cost to be borne by the consumers. Combining low variable spectrum usage fee and the limited number of 3G license issued, the Japanese government created an environment in which mobile carriers could compete with a viable business strategy, such that would be possible for mobile carriers to obtain reasonable profit. This is evident by the intensive competition in Japan, in terms of quality of service and pricing. By adopting open international 3G standards, there is no single carrier having a monopolistic control over technology standards. Therefore, the government measures improved (1) accessing to supporting industry; network externalities which create larger size of supporting industries which extended beyond geographic boundary, as there are more firms designing and providing compatible goods and services; (2) factor/input condition; factor/input condition is no longer restricted by domestic regime. Technology and information technology (IT) are critical to the mobile telecommunications industry, especially in the 3G and beyond mobile, because access to the Internet and other broadband applications drive the next generation mobile development, which is largely IT based.

Hypothesis 3: There would be a phase-by-phase (or step-by-step) directive from the Japanese government regarding industry development, and the targeted industry would grow phase by phase according to the directives from the government. This hypothesis is based on Tsuru's (1993) model.

The research shows that the Japanese government took a step-by-step approach; however, it was not the old post-war style step-by-step, i.e. from creating domestic market to strengthening industry for domestic market

and then creating export market. The steps needed to be different as the market and economy fundamentals and dynamics are different in the digital age. In the 3G mobile development, the Japanese government considered all steps in the light of the global market; from selecting a global standard in WCDMA technology to creating frequency spectrum allocation in line with other countries and international standards, and assignment spectrum in a sensemaking approach after considering international situations, to create an allocation system to facilitate competition.

6. Criticism of the existing literature through the lens of the analysis

The findings of this thesis challenge Porter et al.'s (2000) theory that when there is no government influence on an industry it will prevail, when government intervenes in an industry, it will not be competitive. I agree with Porter et al. (2000) that extreme government intervention will adversely affect competition and could be detrimental to an industry development, i.e. as government involvement becomes excessive, competition is stifled and industry development is crippled. However, it is clear that there is an optimal level where government involvement is not only desirable but critical to creating a competitive environment and a vibrant mobile industry. One of the means by which the Japanese government influences the mobile industry is *amakudari*, this is an 'iron fist in a velvet glove' approach where the government's strong influence through communication is enabled by subtle involvement through an embedded institution (Granovetter 1985).

Where Porter and his colleagues (Porter, Takeuchi & Sakakibara 2000) differ from the analysis of this thesis is that they see direct government involvement as a black and white scenario where no direct involvement by government allows, in their words, free market forces to achieve an optimal market condition and, at the other extreme, where excessive direct

government involvement occurs, it will be detrimental to industry development.

The present research has indicated a grey area where government involvement somewhere between the extremes is fertile, creating an optimum position for competition and industry development, a finding that is backed up by research by Johnson (1982) and Tsuru (1993); however, they are more abstract than this thesis in specifying the level and nature of this involvement. My research focuses on key resources which are mandatory for mobile development, and direct and indirect involvement of the government, allows me to qualify the nature and, to some extent, the level, of government involvement which creates this optimum market position.

When an incumbent mobile carrier ignores government and other stakeholders' views and knowledge, the circuit of sensemaking is restricted; therefore, the incumbent carrier has to rely on its internal views and knowledge. Vice verse for government, if they block effective communication input from the industry stakeholders, there will be a uni-sourced sensemaking approach. These situations are illustrated in Figure 16, where the involved parties have their own view and knowledge with which to make sense of the situation and make decisions based on internalized information. This situation to some degree insulates the government from the sensemaking process which is driving dynamic changes in the industry. Vice-versa, industry stakeholders are insulated from the government's sensemaking process on important resource allocation decisions. A communication circuit would enable both parties to be part of a shared sensemaking process, thus a circuit of sensemaking could be formed to the advantage of the industry in general. The need for effective communications highlights the necessity of providing a circuit of sensemaking where both parties achieve a shared sensemaking view as depicted in Figure 17, which provides a better basis for an optimal condition for the industry, via mechanisms such as collaboration, understanding and concerted direction. This phenomenon is exemplified

through scenarios depicting circuits of sensemaking based on the level of government and industry interaction.

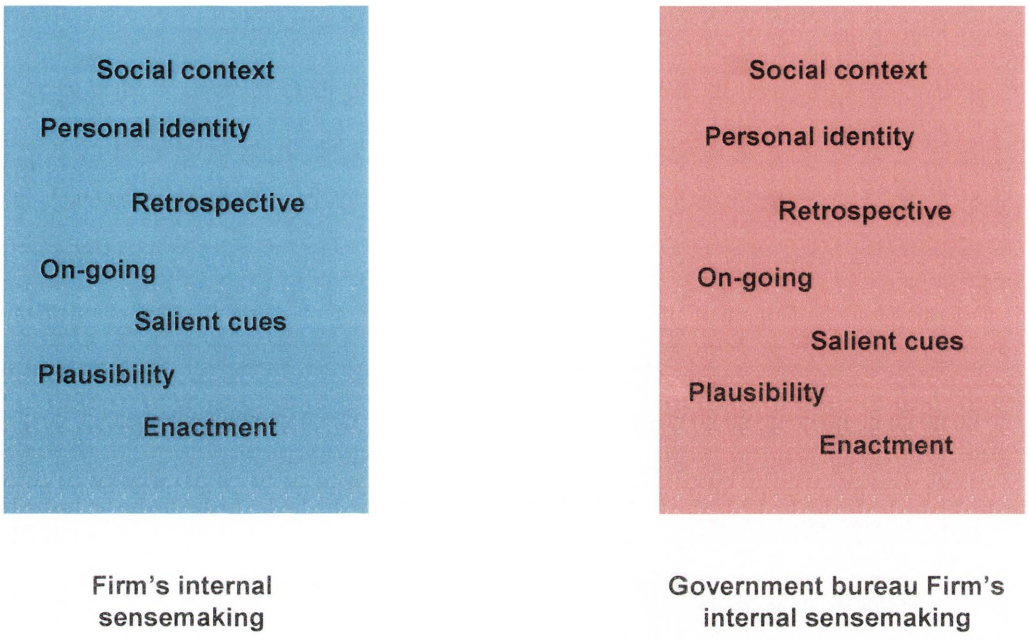

Figure 16. Sensemaking of firms and government bureau, which rely on their internal knowledge and information

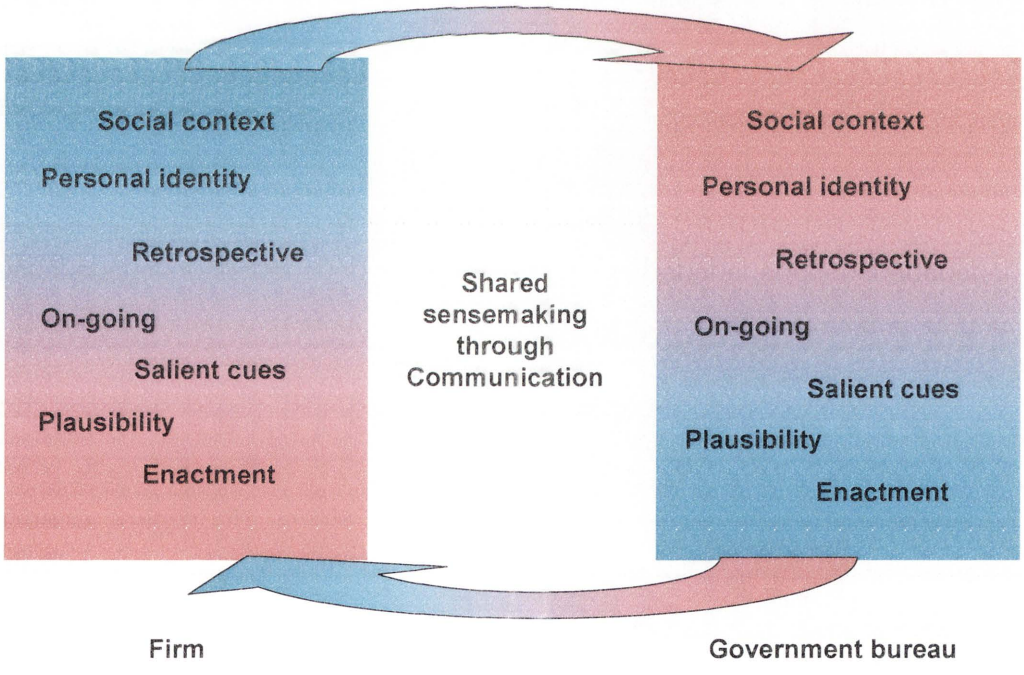

Figure 17. Circuit of sensemaking of firms and government bureau, enabled by communication

Chapter Nine – Conclusion

1. Conclusion

It is clear that a circuit of sensemaking conducted through strong communication is required between industry and government, in the form of feedback and feed-forward relating to the key resources which are the driving forces of the mobile telecommunications industry in Japan. Feed-forward means having prior knowledge about where the industry and technology are going, so that a firm will have product and capability to address the situation when the future point of time arrives. Any uncertainty with any of these resources can cause a mobile carrier to delay investment in infrastructure and product/service R&D and slow down development of the industry, and lower the competition level of the industry. Where carriers' invest without being in sync with the government's long-term direction, in terms of radio frequency spectrum allocation and assignment, and insight concerning international technical standard development direction, it will cripple the carrier's domestic and international competitiveness. Therefore, if there is an insufficient level of communication in the mobile industry, the level of competition will be lower than the optimal level; *amakudari* can be one of the critical instruments to overcome such an undesired outcome and to achieve optimal levels of competition.

There is no doubt that Japan is a world leader in mobile services in terms of application richness and reach at affordable price points. So when this is considered the tension between the theories of market control and government control seem to favor government control in Japan as the best modus operandi if the rewards of competition is the goal.

The mobile telecommunications industry is an evolutionary industry, in which carriers and equipment vendors are working on an on-going basis, creating better and more value-added services to offer customers and expand service coverage in different dimensions.

In Japan, *amakudari* plays a valuable role in facilitating the sensemaking process both in and between the government and the mobile carriers. As an embedded institution (Granovetter 1985), *amakudari* provides an on-going channel which enables both the bureaucrats and firms to obtain and supply information in a timely and efficient manner; thus retrospective sensemaking at each point of time is highly relevant to the direction set for the future action. This is especially important when setting out the direction for 3G mobile in Japan. In the 1990s, the Japanese mobile service was in 2G and dominated by NTT Docomo's proprietary technology standard, PDC, which could make sense at the time, because by controlling the technology standard, NTT Docomo controlled the industry. NTT used the same tactic in the fixed-line sector, NTT controlled their proprietary technology for the fixed-line equipment which is a barrier for non-Japanese equipment manufacturers to create and export equipment for the Japanese market. Something has happened to change NTT Docomo's proprietary technology standard mindset. The government persuaded NTT Docomo to either create or follow an international standard (Funk 2004), not through regulation or legislation, but by communication, exchange of information and ideas. The outcome is that it makes sense to NTT Docomo that joining the global level harmonization trend is beneficial to them; thus, they embraced a direction which was shaped by the Japanese government. This change of direction, from using proprietary technology to embracing international standard, has required NTT Docomo to build a new network for their 3G service rollout, where NTT Docomo could have developed their proprietary 3G standard based on their proprietary 2G network technology, and reused their existing infrastructure which was built for their 2G network. It was a long process. ITU set the direction for frequency spectrum allocation for 3G mobile in the 1992 WRC, and Japan complied with such direction. In Japan, 3G spectrum licenses were assigned in 2000 and services rollout commenced in 2001. It illustrated strong indirect influence that the government has over the ION of the mobile telecommunications industry and the strong longitudinal

communication between these parties that is required for NTT Docomo to achieve this result.

With the wisdom of hindsight, there were severe shortcomings of the NTT Docomo's PDC generation mobile service, in terms of the esoteric nature of the service, which precluded creating a global level of network externalities in terms of PDC based products and services. The Japan government took an active and interactive approach in the allocation and assignment of frequency spectrum to create an environment for competition in the Japanese mobile industry. They worked closely with the global 3G standard setting organization, ITU, and complied with the international frequency spectrum allocation to perform spectrum allocation in Japan.

The Japanese government marshalled the key resources of *amakudari*, technology standard and frequency spectrum and used sensemaking based on the hindsight of moving from a closed environment and embracing the rewards, socially, politically and economically, from the benefits of global network externalities. The government involvement has led to a strong and vibrant 3G mobile industry in which there is a competitive mix of players and mobile value added services with appropriate frequency spectrum available to each at an economically viable price level. This allows commitment of investment in infrastructure, R&D, and creates service innovation using international technology standards and frequency allocation and assignment to capture domestic and global externalities and become a world leader in value added mobile services, such as i-mode.

The key findings are the relationship between the government involvement, both direct and indirect, in the mobile carrier industry, in terms of marshalling the fundamental resources of *amakudari*, technology standard and frequency spectrum to create a favorable harmonization within the ION and a viable and competitive 3G mobile industry in Japan with global network externalities, export capabilities, and national

economic advantage in the digital age. The Japanese government is able to steer the nation's economy in the digital age.

2. Contributions of this research

2.1 Theoretical

Theoretically, I provided a new understanding which enlightens the complex debate concerning government involvement, level of competition and industry development. Based on the data, literature and clues that I gathered, I looked at this debate from several vantage points, and used sensemaking to understand the situation and create scenarios which allowed a simple way of viewing complex government influences and their relationship with industry development. Inevitably, in one way or another, governments are involved in industry development through either direct regulation of an industry and/or indirect influence by creating favorable environment for industry. Decision-making on these direct and indirect influences is a sensemaking process.

I applied sensemaking in analysis and articulated the concept of internal sensemaking and circuit of sensemaking. Internal sensemaking refers to intraorganizational sensemaking. Circuit of sensemaking refers to sensemaking involving other organizations, i.e. in this research, collaborative sensemaking between government and industry stakeholders. The thesis clearly articulates that it is important to maintain a balanced sensemaking process between government and industry stakeholders and that this balance is achieved through on-going communication. In Japan, *amakudari* plays an important role in such communication. In other countries, such communication could be achieved through other media, for instance, government and industry stakeholder collaboration panels and committees. In Japan, however, *amakudari* provides the obligatory passage point (Clegg 1989).

ION in an industry is built on resource dependence (Benson 1975); resources can be tangible or intangible. The power balance within the ION

is the basis of competition. Power is grounded in, but not limited to, resource dependence. The research sheds new light on the form of the integration of dynamics between government, industry and bases of competition by identifying and articulating the value of the blending of sensemaking and the circuit of information. This new view from the lens of sensemaking provides a deeper understanding of the implications and applications of ION relationship, resource dependence and the role of the government. Industries do exist in networks of relationship, as articulated in Benson's (1975) framework of ION relationship; and, the government, as part of the environment, has a critical role in the shared sensemaking process to create an optimal industry performance by resource allocation. Globalization in the digital age, in terms of standardization, domestic and international competition, and global network externalities, is forcing governments to play an active role in the international arena. For instance, in the mobile telecommunications industry, governments see the global externalities benefit of being involved in international bodies, such as ITU, to influence mobile telecommunications technology standards and be fuly informed regarding frequency allocation, to create an environment that will enhance and protect their local mobile telecommunications industry and gain economies of scale through export of mobile technology and services.

2.2 Methodology

The methodology is a contribution to social science. It is a data grounded metamorphogenic process, akin to the transformation from larvae to a butterfly. The larvae stage is where the idea, vision and theoretical framework of the research were formed. The caterpillar stage is where I practically spent all of my time searching for food, which took the form of literature, data and clues. The cocoon stage is where I applied a conceptualized relationship between government involvement and level of competition to create scenarios, and in which I made sense of all the data, literatures and clues that I had gathered throughout the research. The research turned data, literature and clues into a new wave of knowledge

which can be likened to the emergence of a colourful winged butterfly. The research demonstrates that for social science students it is by following the data and making sense of the data they can do analysis which produces sensible methodology. Every piece of research is different, and executing a pre-formulated methodology rigidly could impose limits on the research, which could stifle creative innovation.

2.3 Industry

For the mobile telecommunications industry, I created a plausible account to explain why and how Japan has created a success story for their 3G mobile telecommunications service, recovered from their 2G closed door success, which had created no network externalities outside of Japan. The thesis will help the industry and government, in Japan and other countries, to formulate how to create success stories in the digital generation of mobile telecommunications industry and beyond.

3. Further research

There are other resources which are important and influential to the development of mobile telecommunications industry, such as tariffs, interconnection and number portability; these were not analyzed in this research. It would be interesting for future research to be done on these areas and for it to be contrasted with this research. Detailed analysis of the *amakudari* role from the perspective of 'circuits of power' (Clegg 1989) would further enrich understanding of the working of *amakudari.* As well as The research could be replicated in other countries and other industries and the scenarios could be studied in other countries' context, but there would have to be a search for functional equivalents to the Japanese embedded institution (Granovetter 1985) of *amakudari.*

Appendix A – Pilot Interview Questions

1. How do you describe the mobile telecommunications industry?
2. In your view, which government bureau(s) or independent agency (ies) in Japan exerts most influence to the mobile telecommunications industry?
3. What are the ways this bureau(s) used to influence the mobile telecommunications industry?
4. Are you familiar with the telecommunications law and its changes over the past 10 years?
5. What are the most significant area(s) of policy and regulation affecting the relationship between the mobile telecommunications companies?
6. How has these area(s) of policy and regulation been affecting the relationship among the mobile telecommunications companies?

Appendix B – Final Interview Questions

1. In the mobile telecommunications industry, what are the most critical resources that a carrier has to depend on other organizations to supply? Why?

2. How would you describe the competition in the mobile telecommunications industry in Japan today?

3. Can you recall how the competition has evolved in the industry in the past ten years?

4. Have any legislation or policies helped open up the Japanese mobile market? Can you tell me about them?

5. If 'yes', how have these policies affected how access to scarce resources has developed among mobile carriers?

6. In your view, which government bureau(s) or independent agencies in Japan exert most influence on the mobile telecommunications industry?

7. Which bureaus and agencies are most powerful do you think, and why?

8. How do these bureaus and agencies influence the mobile telecommunications industry? Could you give me some concrete examples please?

9. Thinking of the regulatory environment, what are the most significant policies and regulations affecting the relationships between the mobile telecommunications companies?

10. How do specific policies and regulations affect the relationship among the mobile telecommunications companies?

11. Is there much mobility of people between senior positions in the bureaus and the mobile carriers?

12. If 'yes', under what circumstances do such movements occur?

13. What has been the effect on competition and the availability of resources of the entrance of Vodafone (foreign owned)?

14. What changes would you expect to see, as a result of the Japan Fair Trade Commission becoming independent (again) of MPHPT in April 2003?

15. Has the government assisted the mobile services industry or influenced its development in any way that you know?

Appendix C – Transcripts

1. Transcript for interview with Mr. Kimura

Interviewee	Mr. Kimura (K) (Pseudonym) Mobile Carrier Executive
Interviewer	Chui Yin Lam (L)
Date and time	6th Oct 2004 10am-11am
Venue	Mr. Kimura's office
Recording media	Hand written notes and digital recording
Interviewee's language	English

K: There are two types of government approaches in terms of influencing industries: Two types of Government:

(1) Ministry of Economy, Trade and Industry (METI): their policy is to nurture new industry or develop new industry, thus an enhancement approach. The basis of METI's policy is to increase of GNP on a countrywide level.

(2) Telecom Ministry (MPHPT): their policy is a regulatory approaches. Theoretically, they are thinking of how to stimulate the industry to generate more social benefit (theoretically), but in many case, this is not necessarily effective.

The objective of the Telecom Ministry is to further new value in the industry. They monitor, on an on-going basis, how to regulate the dynamics inside the industry or how to regulate the big players in the industry, so that they won't become too big. This is OK for an matured economy, but it is not OK for a developing economy. When an industry is in a developing state, if the government tells the bigger company that they are too big and not to act too much, then all economic laws in that industry will be stopped. For example, in 1997, if the US government stopped Microsoft from becoming bigger, then we could not have enjoyed the current Microsoft software technology.

Thus, regulatory type of policy would be most effective when that an industry matured. It does not necessarily work effectively in the developing stage of an industry.

It is METI's approach to encourage the players to compete more and to grow more, which would be more effective. Many academic try to analyze

the Japanese's success in the 60s and 70s. During that era, the government used METI's approach rather than the regulating approach. MPHPT is trying to push out the strong player from becoming stronger.

For example in the automobile industry, the government didn't say to Toyota: 'please stop your growth, because your growth will damage other's growth'. They said to Toyota: 'you are the great guy, please continue to grow'. Then Nissan, Honda and other companies followed Toyota's footstep trying to grow their business. This is the approach to make the top company in the industry stronger and then the total competitiveness of the industry will be enhanced.

The other approach is the regulatory approach and the regulatory agency discourages company from becoming too big, so industry's power will be lowered.

L: In your opinion, where is the mobile industry now?

K: The mobile industry is more in the environment of the regulatory approach, but since IT has became more important in the mobile industry, the situation has been changed. The two policy approaches that I have mentioned above worked before the IT revolution. IT revolution took place in the late 90s, after 1996-97. IT itself is very complex and the IT cannot be identified as a single industry in the former model, because all industries are related. Thanks to the complexity of IT industry, and also thanks to the speed of technological development, the government could not do anything for the IT industry, they couldn't follow, which was the helpful for us.

I joined NTT Docomo in 1997, before I joined NTT Docomo, I ran my own startup company in the IT industry. The company didn't go well, it was too early, that's why I joined NTT Docomo. If my company went well, I should be richer.

I know the whole story about the IT industry, the government was very much behind, because they couldn't follow.

When I joined NTT Docomo, there was not any regulation for the new Internet service. So we launched i-mode in 1999, within 5 years, our service coverage reached one third of Japanese population with 42 million subscribers. And thanks to this rapid growth, the government couldn't intervene this activity. That's why we can achieve this. METI tried to enhance other factors in the IT industry, so that it will become stronger. The METI's approach was to provide subsidies to some specific companies or to set up school and program to nourish programmer. This kind of methods is the same as what METI has used in the past for other industry. However, they couldn't follow. Therefore, both approaches, i.e. the regulatory approach and enhancement approach couldn't work in the IT industry.

L: So you see there was no positive impact exerted by the government on the Industry?

K: It was neutral. On the other hand they intervened or stopped any company growth. In 1999 (when I joined), Japan lagged behind the world in terms of IT penetration ratio, PC penetration ratio, it was widely mentioned in the mass media. They say that it was because of the dominance of NTT. But now, 5 years later, Japan is the most advanced IT country in the world. Partly thanks to i-mode and partly to Mr. Son of Softbank, who started Yahoo BB 3-4 years ago, and thanks to him, all cost of broadband services in Japan went down rapidly. Now, Japanese is the country having the cheapest broadband services in the world. Now Japan is very advanced in mobile, broadband and PC worlds.

One contribution from the government is that they introduced ADSL, the new player acted immediate, e.g. Mr. Son used ADSL technology, and the government forced NTT to open their dominant network to the new entrants.

Interview questions:

1. In the mobile telecom industry, what are the most critical resources that a carrier has to depend on other organizations to supply? Why?

(Please note that critical resource is not restricted to physical resources; it covers power and control over certain essential elements or factor in the mobile telecom business.)

K: Everything.

L: For example?

K: Before we provide the multi-media service to the market, our important counterpart is vendors.

The period prior to the arrival of the multi-media services, I call it the "voice age". In this voice age, our only counterpart was vendor, we depended on equipment venders, e.g. manufacturer of handset and base station.

After the introduction of multi-media service such as i-mode, apart from the equipment vendors we heavily are dependent on content providers, IT solution providers and the Internet backbone providers. Because without them, we cannot generate our traffic, or subscriber cannot use the rich content on the Internet. So, we are now dependent on the IT industry.

Without their resources, we cannot do our business. So we are more dependent on the wider industry than in the past, this is especially true when we evolve from the voice age into the "multi-media age".

Now, we try to go further, because we have cover one third of Japan already. I have installed an IC card into tour cellular phone, so our

customers can pay money using their cellular phone at convenient stores. By offering this kind of services, we are now dependent on much wider industries, including the distributing network, vending machine network, and transportation network. For example, ANA and JAL had already decided to adopt this technology for processing passenger check-in and entering the gate, so we are now also dependent on the airline companies.

The next step is "Life age", I want to cover all aspects of human life by mobile phone service.

L: Is it your vision?

K: It is my vision and my company's vision as well. That's why we started selling the e-wallet phone.

L: How about interconnection charge?

K: Only when a subscriber make a call to fixed line network. But most subscribers make cellular to cellular calls. And we are setting it up as a backbone, so from cellular to cellular phone, we are not paying any money for interconnection.

We are the biggest competitor of NTT East and West. It is because our subscriber number is increasing while NTT's fixed line subscriber number is going down.

L: How do you see radio frequency as a resource?

K: It is very important.

Even though we have 56% market share, the government allocated the same band width to all mobile carriers. So KDDI is spoiled. Because the chairman of KDDI is the former top person in the telecom ministry, he was the director general.

It is because of the human connection between the government and KDDI.

L: Do you see this sort of human connection as important resource?

K: For us, no; for our competitor, yes. They welcome ex-bureaucrats.

L: Is KDDI the only carrier has a lot of ex-bureaucrats? How about Vodafone?

K: Vodafone is not. We also welcome them. Some ex-bureaucrats that is kind of Japanese custom, even though they are not creating any value to the company.

2. How would you describe the competition in the mobile telecom industry in Japan today?

K: The competition is very severe, and much severe than the competition in the European market, even though people think NTT Docomo has 56% market share and is a dominant player, it is what the European people always think. However, the competition in the mobile market in Japan is indeed very intense.

But, the reality is that the competition in the European market is easier than the competition in the Japanese market. The reason is very simple, in this country, we have a population of 127 million people, which is big enough to have 3-4 operators, and among these operators, we are using different system. In Asian countries, they are using GSM, there is no competition between systems. But in Japan, among the companies, we are competing with each another, and among the systems.

For the 2G, we use PDC network, which is the Japanese standard. For 3G, we are using W-CDMA, our competitors is using CDMA 2000 as well as WCDMA. Also we have different the layer of systems, we are competing with each another based on the technology that we have. That's why the competition is very severe.

3. Can you recall how the competition has evolved in the industry in the past ten years?

K: NTT Docomo was set up in 1992, between 1992 and 1994 there was not much competition. Before 1994, consumers had to rent cellular phone from NTT Docomo, in 1994 the regulation has been changed, since then end user could buy and own their cellular phone. Customer could buy cellular phone from KDD as well as NTT Docomo. Then the demand for mobile phone explored after 1994. In 1994, there were 1.5 million mobile subscribers; in 1999 there were 25 million mobile subscribers.

I would divide the past ten years into two eras: the first five years, the "voice age", and the latter five years, the "multi-media age".

The first five years, the competition was "voice age" competition, which is normal in the Asian countries right now, how to get the voice demand from the fixed network to the mobile network.

Let me start with the first 5 years. Around 1997, 1998 and 1999, almost all mobile carriers were doing the same thing. They provided s subsidized cellular phones. There were mobile operators selling handsets for JPY1, they were trying to keep their subscribers. There was no service differentiation.

For example, in Hong Kong, they use GSM system, there is no difference between the service provided by CSL and Hutchison, and the same Nokia phone can be used for both carriers' services. There was no service differentiation in 1998, and then we started to think about how we can differentiate ourselves from others. We started i-mode service by embedding the Internet function and IT technology in cellular phones. Then we advanced the project development and launched this i-mode service in 1999; other operators delayed in providing the same kind of service.

The latter 5 years is "multi-media age" competition. We changed the direction of the mobile industry, and the whole industry has been trying to put the additional value added service to the cellular phone, that is

additional to the voice capability. For example, we created value-added services such as video call, finger printer authentication in our handset, and e-wallet. These kind of functions added value to our multi-media services. The multi-media services have been the competition engine for the past 5 years. That's the basic view for the industry.

4. Have any legislation or policies helped open up the Japanese mobile market? Can you tell me about them?

K: The market is open, that's why Vodafone bought J-Phone. Now it is open enough.

5. If 'yes', how have these policies affected how access to scarce resources has developed among mobile carriers?

K: At this moment, no effect at all, but for the future, yes.

L: Why is it the case?

K: Because of the 3G technology. It seems that the 3G technology used by Vodafone Japan will be the technology used in Vodafone Europe. For 2G, they don't have synergy, they are using different system. For the 3G, Vodafone will have synergy from their overseas operations.

L: Isn't i-mode the most advanced technology?

K: At this moment, yes.

L: You see there will be strong competition from Vodafone as they get the synergy from their overseas operations?

K: Yes, that's why we are now doing i-mode alliance, e.g. we have alliance relationship with Telstra, we can share the economy of scale. Our current i-mode partners are comprised of 8 operators who have operations covering 14 countries. Number of customers that Vodafone has is more than 60 million, which is bigger than our subscriber number already. If we can combine our subscriber base with our i-mode alliance's subscriber base, then we can compete with Vodafone in the same scale, That's why 3G, in the future, will be a big battle field for the mobile operators to compete, we are preparing for that by doing i-mode alliance.

6. In your view, which government bureau(s) or independent agencies in Japan exert most influence on the mobile telecommunication industry?

K: MPHPT – who is the regulatory body of the mobile carriers.

7. Which bureaus and agencies are most powerful do you think, and why?

K: MPHPT have the power to set the rule, but I can't say they are always contributory to the industry growth. Nevertheless, they are influential, for example:

i. They decided to introduce Mobile Number Portability (MNP) in 2006, which is very influential in the relationship among the operators, and

ii. This year, suddenly, they say that GPS function is very important and by 2007 or 2008, all major cellular phones should have GPS function for emergency incident to help the users.

L: Do you mean this will be a requirement?

K: I am not sure, because the US government issued the same kind of government requirement. The US government required all operators in US to support either GPS or cell-base location information for 911. But, no operator in US can provide such function for the government. The US government said that by last year's summer, all mobile operators had to do that.

So, the Japanese government's request is kind of a guideline, but we have to so some work, because we cannot neglect the government.

L: Do you mean NTT Docomo is allocating R&D cost on this GPS system?

K: R&D cost is not too much. GPS function is not necessary in generating money. If you look at the KDDI phone, they embedded GPS function in their high-end phones, but there are not many people using the GPS function.

L: How do you think that MNP will be affecting the relationship among the carriers.

K: In this industry, the most important business factor, in terms of business performance, is how to keep the current subscribers. Subscriber movement is called churn. How to lower churn rate and how to get new subscriber are key to us. Of course, we compete with each another very severely, so every month we are losing a number of customers and we are getting certain number of new customers. But the volume of churn-out and churn-in would be much bigger after the introduction of NMP, because the barrier for subscribers to switch between carriers will be lower. Volatility of the market performance will be bigger after the introduction of MNP.

L: Do you have the confidence that NTT Docomo will win after the introduction of MNP?

K: It is too early to comment. Of course, we are trying our best to win the competition. No body wins for 10 or 5 years. If you look at the current Japanese situation, the mass media is celebrating KDDI's winning, but 4 years ago, KDDI was a big loser. 2 years ago, Vodafone was celebrated because of their *sha*-mail service, they were very successful, but now they are loser. So every year, the situation changes.

We are trying to win in the long-run, not in short-run, because short-run success doesn't necessary mean profitability in long-run or medium-run. You can check KDDI's growth in the past 5-6 years.

L: 3 years ago, au lost a lot of their subscribers, do you know why?

K: It is very simple; they were in their process of switching their system from 2G to 3G. We had a hard time last year to switch my main force from 2G to 3G. We launched 3G services three years ago; the main switch of system will take place, maybe this year, after the introduction of the 900 series of handsets. I developed the 900 series.

L: Is it physical development?

K: I mean all specifications and all the design, I directed the manufacturer to make changes. The earlier 3G phone version was an odd phone, I cannot accept it.

L: So you designed the finger print authentication function?

K: Yes, this is my request to Fujitsu. I believe that all people are trying to protect their privacy and data in their cellular phones.

L: This is especially important as a mobile phone is becoming an e-wallet.

K: Now the finger print authentication is becoming more important.

8. How do these bureaus and agencies influence the mobile telecom industry? Could you give me some concrete examples please?

Covered above.

9. Thinking of the regulatory environment, what are the most significant policies and regulations affecting the relationships between the mobile telecom companies?

Covered above.

10. How do specific policies and regulations affect the relationship among the mobile telecom companies?

Covered above.

11. Is there much mobility of people between senior positions in the bureaus and the mobile carriers?

K: Yes and no. But yes for KDDI.

12. If 'yes', under what circumstances do such movements occur?

N: No comment.

13. What has been the effect on competition and the availability of resources of the entrance of Vodafone (foreign owned)?

Covered above.

14. What changes would you expect to see, as a result of the Japan Fair Trade Commission (FTC) becoming independent (again) of MPHPT in April 2003?

K: There are big dispute still. Even inside the government, FTC is says to MPHPT: 'I am sorry MPHPT, it is not your job, and we have to check carriers' dominance in the market.' But at the same time, MPHPT still says to NTT Docomo: 'you are too big, from the regulatory point of view, and we have to regulate this area and that area…' FTC says to MPHPT: 'that's our job, why are you saying so…'

Even inside the government, it is not clear which policy should be done by FTC, and which policy should be done by MPHPT. There are a lot of discussions regarding this matter.

L: One of the major objectives of FTC is promotion of competition.

K: That's great.

L: How is FTC doing their job?

K: They are doing very well, but they can do better. They have to keep power balance because they are just getting independent again from MPHPT last year. From our perspective, they can be more powerful.

From the legislation perspective, FTC should be responsible for all competition, for all industries. But their human resource is limited. I think gradually, they will become stronger and take away some of the existing responsibilities of certain ministries, not only from MPHPT but also from other ministries as well.

15. Has the government assisted the mobile services industry or influenced its development in any way that you know?

K: Of course, especially for the network technology or standardization, the government is heavily supporting.

Standardization among the operators and manufacturer and the network and spectrum allocation and all the network layer things. Yes, they heavily assisted the industry.

L: But operators are using different platform standard/technology, e.g. NTT Docomo is using i-mode, and KDDI au is using ezweb.

K: But KDDI au is changing to *de facto* standard, they are changing from WAP to i-mode now. From the content provider point of view, there is no difference now, they are using html.

L: How about Vodafone?

K: Same, because WAP was a big failure. I have fought WAP people for 7 years. What I have told them is proven right.

If the government standardized the technology for the application layer, there should have been no revolution on the application layer, because WAP was terrible technology. If the government tried to mandate all operators to adopt the same application technology, at that moment, 5-7

years ago, WAP was the most suitable technology for the government to pick up.

Application is part of the IT industry. In the IT industry, there is no intervention from the government, i.e. the government won't say: 'you have to use this technology'. That is *de facto* standard world, the government world is decree standard.

Since the application layer is more affected by the Internet industry, we should follow the IT industry rule, which is de facto standard. The decree standard is better for the network layer, because if the network layer is different, we cannot do roaming, we cannot connect one network with another network.

So, network layer could be a decree standard world, but application layer should be de facto standard world. So we don't need government intervention in that part. If the government have intervened the internet technology, it could be a disaster.

Please note: Interviewee does not have to answer all questions.

2. Transcript for interview with Mr. Ishida

Interviewee	Mr. Ishida (I) (Pseudonym) MITI, senior officer
Interviewer	Chui Yin Lam (L)
Date and time	6th September 2004 4pm – 5:30pm
Venue	Meeting room on 3/F of METI's building
Recording Media	Hand written notes
Interviewee's language	Japanese and English

I: Let me provide an introduction of 3G and 4G mobile in Japan. The mobile industry structure includes (1) carrier business, which is under the regime of MPHPT, and (2) handset business, which is under the regime of METI.

MPHPT's main concern is to create an environment for mobile penetration; the major aspects are security, connectivity and spectrum. Whereas METI's main concern is to strengthen the handset industry, which is our customer industry. Our current priority is on (1) the semi-conductor, PC and the like; and (2) flat panel display. However, the mobile industry is moving up in terms of importance. We will promote M&A in the handset industry. Japanese handset companies are not among the top global companies, one of the reasons is that the mobile technology used in Japan is not compatible in the world. Now is the right timing for M&A. We want to reduce the number of handset makers from 10 to 3, so that they would become strong enough to enter into the European market.

Each of the handset makers has their closely related mobile carrier, the relationships between carriers and handset companies are as following:

Carrier	Handset Company	Remarks
NTT Docomo	NEC, Panasonic, Fujitsu, Mitsubishi	These handset makers have strong tie with NTT.
KDDI	Sharp, Toshiba	Toshiba is very strong in chipset
Vodafone	Sharp, Sony Ericsson	Sharp is very strong in LCD
	Sanyo	Sanyo focus on US Market

In the mobile handset industry, chipset and operating system are basic technologies; it is on the application layer where the differentiation takes place.

L: Could you tell me a recent example of M&A promoted by METI?

I: We have promoted a merger in the LCD industry. There is a joint venture formed by Matsushida, Toshiba and Hitachi. It took two years to make this JV happened. In M&A promoted by METI, the involved companies receive free consultancy from METI.

Unlike MPHPT who uses regulation with enforcement to achieve their objectives, METI uses connection, dialogue, daily market information, investment companies, analyst and insider information to achieve our objectives. METI cannot order companies to do anything, but to catch up with daily market information and offer free of charge consultation to companies.

For the mobile handset companies, after the dot-com bubble burst, their profitability declined, so did their cash. Therefore, they are lack of cash for R&D and marketing, so, it is a favorable time for promoting merger.

Handset is very advanced in Japan. However, the industrial structure is disadvantageous to selling into overseas markets. It is because the handset makers are too close to NTT Docomo, they concentrate on producing products according to NTT Docomo's order. NTT Docomo actually allocates the quantity of handset order among the handset makers. The handset makers lost the hunger for expanding into overseas markets. Therefore the handset companies do not and cannot create products for other countries. They are lack of overseas marketing knowledge as well.

Perhaps, there will be changes in the mobile industry, because of Internet Protocol Wireless Phone (IPWP). IPWP might be available in around 2006-2007, carrier business model has to be changed, so as to face competition from IPWP. For the existing carrier model the mobile monthly charge is around JPY8,000 – JPY10,000. For the Internet Protocol wireless phone (i.e. 802.11 a, b &g), there might be fixed price model, the charge might be around JPY5,000. It seems that there will be new tax imposed by MPHPT on IPWP. However, METI is to promote new industry.

Interview questions:

1. In the mobile telecommunications industry, what are the most critical resources that a carrier has to depend on other organizations to supply? Why?

I: Radio frequency, which is under the control of MPHPT.

L: How about mobile handset technology?

I: IC, chipset, display and software, and human resource in software companies are also important resources for carrier.

2. How would you describe the competition in the mobile telecommunications industry in Japan today?

I: There is too much competition in the handset industry, but not enough competition among the mobile carriers.

3. Can you recall how the competition has evolved in the industry in the past ten years?

I: There is less competition in the handset industry, which has weakened the industry. For example, NTT group decides the quantity needed from each of the mobile handset companies (i.e. NEC, Fujitsu, Panasonic and Matsushita). These handset companies have lost the hunger to get more business. NEC is the only company, which is hungry to get into the overseas market.

L: For carrier market, there were more players 10 years ago than there are now, why is that so?

I: Maybe it was only deal to market-reacted movement.

There is not enough competition in the mobile industry. And it is an unclear process as in which carrier can use what frequency. Maybe there is rule, but the final decision is very unclear. Maybe it is a power game.

4. Have any legislation or policies helped open up the Japanese mobile market? Can you tell me about them?

I: The change in regulation in limitation of foreign ownership in telecommunications market.

Telecommunications is essential for an independent country, and telecommunications is a key industry. Due to national security reason, the state has to make sure that what we talk over the phone would not be tapped into. It is not acceptable to have no Japanese company in the telecommunications industry.

L: What do you think, if a foreign company dominant the telecommunications industry in Japan?

I: Basically, it will be decided by market efficient.

L: How about, for example, Vodafone and YahooBB (Softbank) have a combine market share of more than 60%?

I: Then, that might touch the national security issue.

5. If 'yes', how have these policies affected how access to scarce resources has developed among mobile carriers?

NA

6. **In your view, which government bureau(s) or independent agencies in Japan exert most influence on the mobile telecommunications industry**?

I: MPHPT – the telecommunications bureau, radio frequency division, land mobile communication division. METI does not control the handset industry, but to help this industry develop.

L: How about Japan Fair Trade Commission (JFTC)?

I: JFTC has limited power; also their human resource and budget are very small. However, in 2003, a person with strong political power has been appointed as JFTC CEO. The new CEO has strong gut to do something new. We (METI and JFTC) are going to attack Microsoft. We would like to stop the spreading of windows into consumer products. However, it does not necessarily mean that it has to be a Japanese company to try to create alternatives.

7. Which bureaus and agencies are most powerful do you think, and why?

I: MPHPT – the telecommunications bureau, radio frequency division, land mobile communication division.

8. How do these bureaus and agencies influence the mobile telecommunications industry? Could you give me some concrete examples please?

I: As mentioned above, MPHPT uses regulation with enforcement, whereas METI uses connection, dialogue, daily market information, investment companies, analyst and insider information. METI cannot order companies to do anything, but to catch up with daily market information and offer free of charge consultation to companies.

9. Thinking of the regulatory environment, what are the most significant policies and regulations affecting the relationships between the mobile telecommunications companies?

I: The policies related to radio frequency.

10. How do specific policies and regulations affect the relationship among the mobile telecommunications companies?

I: In mobile business, volume of business depends on the volume of frequency of a carrier has.

L: Is NTT Docomo being favored by MPHPT?

I: Not really. But NTT Docomo has strong influence over MPHPT. For example, the new tax to be imposed on IPWP might have been suggested by NTT Docomo. NTT is very powerful; it has more than 200,000 employees.

11. Is there much mobility of people between senior positions n the bureaus and the mobile carriers?

I: There is strong influence on the industry through amakudari. Thee are over 30 former METI bureaucrats in the mobile carrier and handset companies, except Sony Ericsson. Our Prime Ministry Mr. Koizumi wants to lower the number of amakudari over the next 5 years.

12. If 'yes', under what circumstances do such movements occur?

I: It depends on negotiation between the HR division of the ministy and the company. At the company request, the HR division of METI will provide a list of candidates. It is the division director to arrange or promoe the arrangement. The final decision will be made by the HR divisio, however, normally, the HR will follow the division's recommendation.

L: Do foreign companies ask for amakudari?

I: Yes, for example, since long time ago, IBM requests for amakudar.

There are three levels of staffing in ministry:

	Level
1	Director
2	Middle
3	Without degree

For level 1 director:

Selection		Goal
45 y.o.		55 y.o.
20 people	→	1 person

By the time one of the staff from the same year achieve the top job, there will be 19 people leaving the ministry, some of them may join the industry through amakudari.

13. What has been the effect on competition and the availability of resources of the entrance of Vodafone (foreign owned)?

I: Not much.

14. What changes would you expect to see, as a result of the Japan Fair Trade Commission becoming independent (again) of MPHPT in April 2003?

I: No change

15. Has the government assisted the mobile services industry or influenced its development in any way that you know?

I: METI does financially assist the industry by providing R&D subsidies. For example, there is a USD 25 million subsidies in R&D for a router project. METI is subsidizing NEC and Hitachi's new router joint venture. This will be a three years project commences in 2004 and will be completed in 2007. We want to see Japanese companies to make reliable and safe routers.

3. Transcript for interview with Mr. Suzuki

Interviewee	Mr. Suzuki (S) (Pseudonym) MIC, Senior executive
Interviewer	Chui Yin Lam (L)
Date and time	15th September 2004 10:00am – 11:00am
Venue	Mr. Suzuki's office in MIC
Recording Media	Hand written notes
Interviewee's language	Japanese

Note: Mr. Suzuki preferred to give an account to describe how the government involves in the mobile telecommunications industry.

S: There are important layers of matters for mobile operators, they are (1) infrastructure layer, (2) platform layer, and (3) application layer. The ministry's communication policy is based on these three layers. In order words, the government introduced competition through infrastructure, platform and application.

Long time ago, the focus of the Japanese government's regulatory consideration was on the infrastructure layer only. It was because the infrastructure layer was the core of the telecommunications business, where voice was the major telecommunications business. Until the introduction of ADSL business, there was not much change in the fixed line business.

There is ubiquitous fixed line infrastructure in Japan. After the new regulation/deregulation in 1985, new telecommunications operators could easily access the fixed-line infrastructure, while NTT has the sole control over the last-mile. Since the introduction of the new regulation/deregulation, the fixed-line telecommunications industry is moving from monopoly to semi-monopoly. The major difference between fixed line and mobile telecommunications sector is that radio frequency is a necessary resource in the mobile telecommunications sector. Unlike the fixed-line infrastructure, there is limited frequency band available for mobile operators, thus, there is limited competition in the mobile sector.

In Japan, the mobile terminal (handset) quality is very high. Multiple services could be used via a mobile phone, i.e. there are voice, data, picture and image services provided through mobile phone. While, there are different platform in Japan, i.e. i-mode, ezweb and Vodafone Live!, competing with each another.

There is an e-Japan initiative; regulation is to enable the construction of a ubiquitous IP world where good application could be developed.

It is the government's responsibility to create an environment for competition and open the monopoly network. Until 1985, there was monopoly in the telecommunications industry (including the mobile sector) in Japan, now there are NTT Docomo, au, Tu-ka and Vodafone in the mobile sector.

L: Has the competition stopped? The price of mobile service is not going down anymore?

S: Though the price is high in Japan, penetration rate of mobile telecommunications is very high as well.

L: Is there any mobile wholesale market in Japan, as the ones in UK and Australia?

S: There is MVNO (Mobile virtual network operator) in Japan. For example, Nippon Tsushin is providing service on DDI Pocket's PHS network. However, it seems that there is no good business model for the MVNO, also, there are some technical obstacle in actualizing the wholesale model.

It is partly due to the mobile handset-dependent business model. In Japan, if a MVNO wants to resell mobile service, it has to sort out the handset issue, as a particular mobile service wholesaler has its own technology and own particular handsets. This involves a huge business model.

L: Now I understand that the difference technological and business models in Japan and overseas making wholesale model a total different regime in Japan.

S: Competition environment for mobile operators in Japan is affected by factors such as, (1) expansion of the market, (2) right to determine pricing level, (3) introduction of mobile number portability, (4) introduction of flat rate, and (5) entrance of new comers. These factors affect the competition in the mobile business in one way or another.

(1) Expansion of the market

10 years ago, the fixed line telecommunications business was very profitable, but there was not much profit in the mobile business. It was not expected that mobile business would become such a big business. Therefore, the government allowed NTT Docomo to determine the mobile service pricing level; NTT Docomo set a high price for their mobile services.

(2) Right to determine pricing level

Now, mobile operators have the right to set pricing level. Mobile opertors now do not need to obtain approval from Telecommunications Bureau to change their pricing level.

(3) Introduction of mobile number portability system

In 1.5 to 2 years time, there will be introduction of mobile number portability in Japan; people will be able to change their mobile service provider while keeping their original mobile number. It has been a hustle to change mobile service provider, because you have to have a new mobile number. It makes it very problematic to change mobile service provider.

(4) Introduction of flat rate

The mobile services tariff in Japan is not expensive; the mobile ARPU is Japan is high because it is very convenient to use the multiple services provided by mobile service providers. As consumers use more of the services, they pay more. This is the same as in the fixed-line market, 10 yen (or now 8.5 yen) per 3 minutes is cheap, and the service is convenient, that's why consumer use the service a lot. Now mobile operators could offer flat rate plan to their customers.

(5) Entrance of new comers

NTT Docomo was initially the monopoly in the mobile industry; but now apart from NTT Docomo, there are au, Tu-ka and Vodafone in the market. However, due to the limited availability of radio spectrum, the earliest opportunity when Softbank (or YahooBB) can join the mobile telecommunications sector is year 2006.

4. Transcript for interview with Mr. Sato

Interviewee	Mr. Sato (S) (Pseudonym) MIC, senior officer
Interviewer	Chui Yin Lam (L)
Date and time	10th Sept 04, 1pm-2pm; 16th Sept 04, 2pm-3:30pm
Venue	Conference room, MIC
Recording media	Hand written notes and digital recording
Interviewee's language	English

Interview questions:

1. In the mobile telecommunications industry, what are the most critical resources that a carrier has to depend on other organizations to supply? Why?

(Please note that critical resource is not restricted to physical resources; it covers power and control over certain essential elements or factor in the mobile telecommunications business.)

S: Frequency spectrum is the most important resource in the mobile industry.

2. How would you describe the competition in the mobile telecommunications industry in Japan today?

S: Mobile is a new industry. Initial investment required is lower in the mobile business than in the fixed-line business, thus the entrance barrier is lower for the mobile business.

Compared to ADSL, where there are a lot of players, competitive pressure is not so high in the mobile sector. It is because there are only a small the number of companies exists in the mobile industry.

There is competition between Docomo and au. J-Phone started Sha-mail few years ago. The next step of competition is in 3G, au has launched CDMA 2000 and Docomo has launched FOMA. The rivalry is quite strong.

3. Can you recall how the competition has evolved in the industry in the past ten years?

S: In 1994, the Customer Owned and Maintained (COAM) system was introduced and handset is free to be purchased by consumers. Since then there were more competition in the mobile industry. Docomo, J-Phone, IDO (DDI) and Cellular were competing against the fixed line telephone service operators. In around 1998 and 1999 the number of mobile subscribers has overtaken the number of fixed line subscribers.

Today there are 80 million mobile subscribers and 60 million fixed line subscribers in Japan. The fixed line market is matured; this fixed line market does not include the ADSL market. Now, in the mobile market, there is technological competition. If a company can bring in new technology and new service, and improve the quality of their services, the company will be able to gain competitive edge.

4. Have any legislation or policies helped open up the Japanese mobile market? Can you tell me about them?

S: There is a policy to make more frequency available to the mobile operators, this is a technology driven process. We keep looking for new technology to slice up the new frequency band for the mobile operators. If there is more frequency available, there will be bigger room for services. Again, it depends on technological development.

In Japan, frequency is allocated rather than obtained through auction as in Europe. I think the auction system kills competition because only the companies can afford the frequency could get into the business. I believe EU is trying to make competition among countries rather than within countries.

5. If 'yes', how have these policies affected how access to scarce resources has developed among mobile carriers?

Addressed in elsewhere in the interview.

6. In your view, which government bureau(s) or independent agencies in Japan exert most influence on the mobile telecommunications industry?

S: MPHPT – telecommunications business bureau, the radio division, and the service tariff division. It is the radio division's responsibility to find out new technology for the usage of radio frequency. On the other hand, METI is in charge of mobile terminal.

7. Which bureaus and agencies are most powerful do you think, and why?

S: Telecommunications Business bureau.

8. How do these bureaus and agencies influence the mobile telecommunications industry? Could you give me some concrete examples please?

S: The Telecommunications Business Bureau acts as a channel of communications. The bureau is restructuring the regulatory environment as well; this is under the Prime Minister's instruction.

In the old days, the government wanted to control, but now, we don't want much control. The government now wants competition and development in the industry, so that we can gain international competitive advantage.

9. Thinking of the regulatory environment, what are the most significant policies and regulations affecting the relationships between the mobile telecommunications companies?

S: There are a number of polices affecting relationship between the carrier, such as interconnection, service tariff, consumer protection and foreign ownership.

Interconnection tariff between Docomo and au is now not regulated; it is a business based negotiation between carriers. Docomo had to submit interconnection tariff but KDDI and Vodafone were not required. This regulation was changed in 2001.

Prior to 1997, when a mobile carrier decided to change their service charge to customer, they needed to get government's prior approval. The government used a particular base to calculate tariff and determine whether an approval should be granted. There was one tariff for one carrier for both charge and contract.

In 1997, tariff except charge was deregulated (tariff is the rate for using mobile service; charge is other payment, for example, termination charge).

In 2001, there was full deregulation on tariff. Since then, there is no need for mobile operators to file to government for obtaining approval. The operators need to merely notify the government about their change in tariff.

In 2003, there is no more regulation on tariff anymore. There is no meeting for tariff anymore.

Consumer protection is becoming more and more important in Japan. Now the mobile operators have to interact with their consumers. Also, because of consumers protection policy, the influence is from the consumers to the government then to the operators.

There was an abolishment of foreign ownership regulation for the telecommunications carriers, it took place about 7-8 years agoIt didn't have strong influence then, it was a couple of years later Vodafone came into the market.

This deregulation has significant influence on the fixed line business, , for example, this deregulation allowed BT to Japan run their own business in Japan.

L: How was J-Phone doing?

S: They were doing well. J-Phone has 1.5GHz band while Docomo and au have 800MHz band. For the technology at that time, there is come advantage of 800MHz band in the voice transmission. If you look at the technology at that time, 800MHz surely have advantages over 1.5GHz, particularly the transparency and availability against the buildings. So, from the beginning, J-Phone had some disadvantages. But, despite this disadvantage, J-Phone started the Sha-mail (photo mail) service, in that sense they were the pioneer; and photo transmission service is an innovative service and it went very well.

There are disadvantage and advantage. J-Phone has some disadvantage from the beginning, but you can see it is as advantage. J-Phone had advantage and disadvantage in QOS (Quality of Service), it is sort of trade-off. One can take the audio service disadvantage and weight against the advantage of 1.5GHz band. J-Phone had disadvantage but they did very well, especially in commercial, promotional campaign, and sha-mail.

I am not sure about the capital issue; maybe J-Phone's financial background is not as strong as KDDI and Docomo. Maybe huge investment is required in the mobile. Compared to the fixed line, the competition in mobile telecommunications is pretty fast and strong. In that sense, need of capital is stronger than the one in fixed line and broadband ADSL.

L: I reckon that Japanese companies have their own culture and own way of communication. Before Vodafone joining the mobile sector in Japan, all mobile operators were Japanese company. Do you think Vodafone has disturbed the communication between the companies, i.e. between Vodafone and Docomo, and between Vodafone and KDDI?

S: On technical basis, I don't think so. But there might be some impact on the informal communication. We are not good at communicating in English. If Vodafone's VP could not speak Japanese, it could be a problem. Sometime, particularly, the senior people don't like to have interpreter in a conversation; it slows down the conversation and affects the tempo of the conversation. But, it is Vodafone's responsibility. They could have hired a Japanese president for their subsidiary in Japan.

L: They are now doing it.

S: Finally. It took them many years to do it. After the decline of sales, it is kind of too late. It is my personally opinion. Look at Toyota. When Toyota goes overseas, 2-3 years after starting their operation, they would hire local people to run manage the business, for example, American in American plant. If there is a Japanese president in a plant located in American, it is too distinctive. Toyota hires Americans who understand the Toyota's philosophy. It should be better for both the factory performance and the workers.

But for Vodafone, they finally hired an ex-Docomo executive to become their president in Japan.

L: Maybe be I should check how many expatriates have left Vodafone during the latest re-organization. I heard there are some 700 staff being laid off.

S: I have recently read from a newspaper that there was a quota for around 1,000 (*not 100% sure about the number*) volunteer retirement in Vodafone in Japan, and within one day, the quota was filled. The workers know whether their company is shaky or stable, they know their company better than we do.

I would like to cover the concept of dominant player, there is Substantial Market Power (SMP) regulation in Japan. From 2001, there is free competition in the mobile industry. However, if a carrier falls within the definition of having SMP, then it will be subject to more rules. We have a special calculation method in Japan to determine SMP:

'Market Share' multiplied by 'the operator's % share of sale of the market's total sales'

For example, if Docomo has 60% market share and earned JPY4 billion revenue out of the total revenue of JPY10 billion in the relevant market:

60% X (4/10) = 24% (does not have SMP)

If the result is >25%, the operator will be designated as a dominant operator.

For the fixed line business, the calculation is simple facility-based share, e.g. NTT East has more than 50% of the subscriber line in one prefecture, then NTT East's facility for the network in that prefecture will be designated as dominant network. In the mobile business, there is no physical limit or boundary, because it is intangible. It is in the air, it works as far as the operator has the radio band. Therefore, it is quite difficult to determine what would be dominant power in the mobile.

On the other hand, communication frequency band which is a limiting factor to the number of operators. We are trying to establish some ideas which are close to SMP, but it is still related to facility-based dominant regulation. We have introduced this SMP regulation in 2001.

The existing dominant players are NTT Docomo and Okinawa Celluar (that is Tu-ka in Okinawa). Okinawa Cellular is doing very well in Okinawa, unfortunately, they have triggered their dominant player designation. Indeed, the only requirement for dominant play is to submit interconnection tariff as NTT East and NTT West do. Unlike the fixed line NTT East and NTT West, which need to get approval from the ministry on their interconnection charges, a dominant mobile carrier need to notify the ministry and disclose their tariff. Further a dominant mobile carrier needs

to provide equal treatment to all carriers, which include fixed line carriers and mobile carriers.

This regulation is not very strong, because, normally, even though there is no such regulation, the carrier will do the equal treatment. Except for the NTT Group, that's why we salvage the filing rule for NTT Group that includes NTT East and West and NTT Communications. For Docomo, it is OK. Docomo has 9 companies in Japan, e.g. Docomo Holding, Docomo Central, Docomo Kansai. There are rules on inter-companies activities among the subsidiaries. This rule this is not as tight as the one for NTT East and West and NTT Communications; the rule is for treatment of consumer information and some financial arrangement.

L: Do you consider Docomo as 9 companies or one company?

S: We consider Docomo as one company when we consider the policy of dominant operator. On operational level, they are 9 companies; they have to submit 9 separate financial report and subscriber data to the ministry.

L: Let me clarify, when you calculate SMP, you treat Docomo as one company?

S: No, we consider them as 9 companies. Because they don't do mutual entrance, for example, in Tokyo, there is only Docomo Central in charge of Tokyo, and in Osaka, there is only Docomo Kansai in charge of Osaka. So the calculation will go prefecture by prefecture, there are 47 prefectures in Japan. We do one calculation for each area. Docomo is winning in all area except Okinawa. Therefore, Docomo Hakkaido is dominant in Hakkaido area, and Docomo Central is dominant in the Central area.

10. How do specific policies and regulations affect the relationship among the mobile telecommunications companies?

Addressed elsewhere in the interview.

11. Is there much mobility of people between senior positions in the bureaus and the mobile carriers?

S: Softbank's president, Mr. Son, has made a comment in the media that he will not accept any ex-bureaucrats for 100 years. It is quite a comment. It is a social system in Japan and there is history for this social system. This amakudari system helps prevent bribery, especially in the later year of a bureaucrat's career. The system works pretty well when the economy is growing. After we accomplished the economic growth, the society itself have to change, but this is one of the areas which didn't change.

Amakudari is kind of taboo. Because if we discussion amakudari, we have to discuss our salary, which is a sensitive issue.

L: When an ex-bureaucrat joins a carrier, it is the company pays the ex-bureaucrat, why would there be negative sentiment from the public?

S: That's right, but it is also a consumer perception issue. For example, if a carrier employs an ex-bureaucrat, his/her salary come from phone charge paid by consumers.

L: If a company is interested in employing an ex-bureaucrat, and paying him/her the salary, there must be some value of such employment.

S: In the US, people can move from university, to FCC, and to carriers. But there are strict rules in Japan.

L: Can you work in whatever company you like after your retirement?

S: No, for the first two years, we can only work in public sector, such as an institute, research center (with public sector characteristics), or NPO. After 2 years, we can join any company we want.

L: For amakudari, can people join private company straight away?

S: Amakudari is after the first two year. For example, the KDDI chairman, he is former vice-minister of Ministry of Telecommunications; he worked in Data Communication Institution and two other institutes for two years before he joined KDDI as the chairman.

He can make to the position because he was good. He did a good job when he was the director general, then he made to the vice-ministry position. He got good reputation in Nagatacho area, everybody knew him. Then KDDI picked him 2 years after he has finished his career in the ministry as he reached the top position. He still has some influence on the industry.

L: Is he still working with KDDI? Does he come back to the ministry sometimes to talk to the people?

S: Yes, he is still working with KDDI and he maintains top level communication with Aritomi san and Igara san. I believe that they have frequent communication.

L: Do you think this sort of communication helps both the ministry and the company? For the ministry, does it help in managing the industry?

S: Yes, I think so. It helps a lot.

We know the rule, i.e. there is something KDDI and the ministry should disclose to each another; as long as both parties observe the rules, there is no harm for communication. We have to avoid distorting the rules as well.

Communication between a government and a company is very important. That's the most important thing when one handles political issues.

Otherwise, it could be the situation that operators do not look at the government and keep breaking the rules, then the market will be distorted as well; the consumer will be harmed, therefore, we should avoid such situation.

L: Anyway MPHPT ex-bureaucrat went to J-Phone?

S: Yes, a couple of them.

L: Do you think anyone will go to Vodafone?

S: If Vodafone asks us to introduce a couple of people to help them to re-organize their company, then we will co-operate, as long as some body raise his/her hand. It is a simple business negotiation.

L: If an ex-bureaucrat joined J-Phone and still working for the same organization, now a foreign owned company, would he receive the same treatment in the ministry as before?

S: It is totally up to Vodafone, whether they want amakudari or not. Vodafone is different from J-Phone in a sense that they is very careful with their stock price; they have shareholder-oriented management. If Vodafone finds that there is shareholder's value of amakudari, they might go for it, otherwise, they won't go for amakudari.

If they understand the benefit of amakudari, information, connection and knowledge, they will go for it.

12. If 'yes', under what circumstances do such movements occur?

Addressed elsewhere in the interview.

13. What has been the effect on competition and the availability of resources of the entrance of Vodafone (foreign owned)?

S: It is simply a change of ownership. From the telecommunication stand point, it is a succession of one company. Vodafone was not a new entrance; it succeeded a Japanese company. At the time of the acquisition, J-Phone was a good company.

L: Do you think Vodafone has brought in different business model?

S: I think that Vodafone has its own channel incentive model.

For example, when you go to Big Camera, you pay JPY10,000 for a FOMA handset, the market price of the handset is JPY40,000, Docomo pays JPY30,000 to the channel, but Vodafone doesn't like this kind of incentive model. They want to get good enough handset at the cheapest price as possible. The reason for the bad result of Vodafone could be that Japanese do care about how our handset looks in our hands; it is a Japanese characteristic. But Vodafone didn't care enough about the

handset, but they only went into cost analysis. I don't think it is a mistake strategy, but the young Japanese didn't accept the strategy.

L: Is it Vodafone's miscalculation?

S: Yes, it is a miscalculation on the business competition level.

14. What changes would you expect to see, as a result of the Japan Fair Trade Commission becoming independent (again) of MPHPT in April 2003?

S: I welcome the independence; it didn't look good when the FTC was under the same umbrella of the MPHPT. Being independent is the way supposed to be.

L: Do you think FTC will do more from now on?

S: The boundary between FTC and the ministry might be unclear to the public, but it is very clear within the government. I don't expect many things will be changed, but it is a fight for boundary. Takeshima is now the chairman of FTC; he is aggressive in his position. He wants to expand his boundary to communications. He has some ambition, but it didn't work so far.

L: The equivalent of FTC is FCC in the US and ACCC in Australia, telecommunications is one of their biggest areas to be looked at, it is due to the existence of natural monopoly in telecommunications market.

S: FTC's mission is competition. Our mission is not competition; competition is a tool to increase mass user benefit. It reasons why we don't look at the market share number. FTC always checks the market share numbers. For example, we have 4 cement companies, two of them want to execute a merger, which will affect the competition dynamics in the market, then FTC will say something to the merger.

But for the telecom, we just separated NTT into NTT East and NTT West companies; before that even though the market was monopolized by NTT, as long as the mass consumer or user are happy, we don't say anything about the monopoly. But we would say something on the management or the way of providing services, because it is better to increase the benefits to the society. Therefore, the principle ideas of FTC and the ministry are different.

We see competition as tool for policy enhancement. Our policy is to look at the consumers or user's benefit, if lack of competition will decrease or have negative effect on user's benefit, than we will try to enhance competition in the relevant sector. FTC wouldn't say anything when there is too much competition. To us, if there is too much competition, there might be negative effect on enhanced competition took place. We will say something on competition from different point of view. It is an issue of boundary.

15. Has the government assisted the mobile services industry or influenced its development in any way that you know?

S: Yes, there is financial assistance from the national budget for fundamental research. There is no protectionism from the government, because there is natural geographical boundary of telecommunications industry (carrier).

We support competition for technical standard. We have our ex-vice minister as the head of ITU right now. We try to get the most advantage from his position. It is a technological strategy; and our ministry is part of it. There are many stakeholders in this strategy, e.g. METI and Ministry of Education, it is a corporate effort to serve the strategy. There is competition for technological standard, particularly competition for becoming the de facto standard. Just as Cisco is now the de facto standard for their industry. The style of competition has changed, it is very complicated, and we can't directly assist and help one company's R&D, we need to care what is going on in the market.

There is strict rule on the funded research as well, we can only conduct fundamental research, and no research on application could be funded by the government.

5. Transcript for interview with Mr. Mori

Interviewee	Mr. Mori (M) (Pseudonym) Telecommunications veteran, executive consultant
Interviewer	Chui Yin Lam (L)
Date and time	5th Oct 2004 11am – 12am
Venue	Mr. Mori's office
Recording Media	Hand written note and digital recording
Interviewee's language	Japanese and English

Interview questions:

1. In the mobile telecommunications industry, what are the most critical resources that a carrier has to depend on other organizations to supply? Why?

(Please note that critical resource is not restricted to physical resources; it covers power and control over certain essential elements or factor in the mobile telecommunications business.)

M: Regulation could be good or bad.

Critical resources include (1) radio spectrum, (2) telephone number (carrier designated dialing numbers), and (3) the right to set service tariffs.

When NTT Docomo was first created for mobile services, it was small and needed to invest a lot to develop the mobile network. That's why the ministry allowed NTT Docomo to determine the charges and rates (this includes reception and transmission rates).

NTT East and West are required to get permission for their fixed line tariff, but mobile carriers only have to file a notification to the ministry. The fixed to mobile tariff is decided by the fixed line carrier.

For a mobile carrier to do business, it needs to get a licence, then a spectrum, and then designated dialing numbers from the ministry.

Also the mobile carrier needs to interconnect with mobile and fixed line. The network interconnect point between mobile and fixed. It is up to the carriers' negotiation, then they have to notify the ministry.

L: How is a call routed from Vodafone to NTT Docomo?

M: I believe it has to go through the NTT network.

L: There are two types of exchanges in the NTT network, could you please explain?

M: The lower level and the higher level. There are different condition and prices for connecting to different level of exchange.

One of the advantages in Japan is that, NTT has to make their network available to other carriers. When a new carrier lodges a request to NTT, MPHPT will help to enforce it, there is legislation for this.

NTT's network is a resource to mobile carriers, and it is the legislation that guarantees the mobile carriers can have access to this resource. Because of Softbank's lawsuit, now the standard time for interconnection is two months.

There are multiple technical standards in the mobile industry, it is up to each company in the industry to determine their own standards, this may lead to interoperatability problems among mobile carriers. There are different frequency modulations in Japan, e.g. WCDMA and CDMA....

Because there is no technical standard, there is competition among the carriers to use their own technology to improve the speed of transmission.

2. How would you describe the competition in the mobile telecommunications industry in Japan today?

M: There is no price competition yet. It is still expensive to use mobiles, the voice service is expensive. Because there is no outlaw like Mr. Son from Softbankthe shake up the mobile industry like he did with ADSL. NTT set a high price for ADSL, but as YahooBB started offering ADSL at lower prices, the price for ADSL services dropped across the ADSL market.

It is the Japanese way of thinking; they have unified thinking, just look at MPHPT. It is non-documented regulation, e.g. if I introduced very cheap price whether MPHPT will accept our notification or not. Therefore, there is no drastic pricing set. But, if Softbank joins the mobile industry, it is likely that there will be a dramatic decrease in prices.

There is deregulation in setting service tariffs, as far as the government is concerned, this is to create a competitive environment.

The mobile companies are probably happy with what they are getting now. Three of them share 80 million subscribers in Japan. Vodafone has 18 million subscribers in Japan, which compared to their subscriber number in UK is huge. Vodafone's ARPU is very high in Japan; if they lower their prices, their financial performance will get worse, that's why they haven't lowered their prices. Because the carriers are taking cue from

one another, they do not need to lower their prices until one of them starts to do so. That is the Japanese practice of 'looking at each another's face'.

To sum up, there is freedom to compete in the mobile industry, i.e. the right to set tariffs, if someone wanted to halve their prices, they would not actually be violating any regulations.

3. Can you recall how the competition has evolved in the industry in the past ten years?

M: There are different layers of competition: (1) coverage, (2) connectivity, (3) capacity, and (4) application.

For the past 10 years, Japanese mobile carriers have worked hard to make mobile services available everywhere. Compared to the US, maybe the coverage in Japan is better, due to competition in network. In the US, the country is too big, and it is their business philosophy that, unless they can make money, they won't build the network. In Japan, when consumers complain to NTT Docomo about the non-availability of their service, NTT Docomo will act on it.

Connectivity – this could be connectivity among the carriers, on the network level, direct internet browsing, TV (Now it expanded to connecting to other networks, e.g. broadcasting network and the Internet network)

Capacity is the speed of data transmission.

Application, for example, Internet access with handsets, sha-mail...

There are other factors affecting the competition, such as, (1) mobile number portability (MNP), which will come in effect in 2006, competition will be intensified then, and (2) Softbank, if Softbank joins the industry, there will be drastic competition.

4. Have any legislation or policies helped open up the Japanese mobile market? Can you tell me about them?

M: Change in the restriction on foreign ownership. It used to be an unwritten rule that, foreign carriers not be granted a spectrum. When Vodafone bought Japan Telecom, permission was required, but now, only notification is required, , Vodafone has to get permission from the MPHPT, but now it is much easier. Only notification after the acquisition is required, except when it comes to NTT, there is still asymmetric legislation for NTT.

In the mobile business, there are no restrictions on technology standards, so there has been a revolution in mobile technology.

The right to set tariffs (with only notification required) for mobile services is just a beginning. There is not yet a drastic impact brought about by this legislation, because there is no Mr. Son in the mobile industry. E.g. now, au can offer 'double fixed price' for their data service. But voice is still important and is the main stream of revenue for the mobile business.

5. If 'yes', how have these policies affected how access to scarce resources has developed among mobile carriers?

Addressed elsewhere in the interview.

6. In your view, which government bureau(s) or independent agencies in Japan exert most influence on the mobile telecommunications industry?

M: Business Policy Division of Telecommunications business bureau.

7. Which bureaus and agencies are most powerful do you think, and why?

M: Business Policy Division.

8. How do these bureaus and agencies influence the mobile telecommunications industry? Could you give me some concrete examples please?

M: Legislation.

L: How about the non-documented legislation? The human relations?

M: Yes.

9. Thinking of the regulatory environment, what are the most significant policies and regulations affecting the relationships between the mobile telecommunications companies?

Addressed elsewhere in the interview.

10. How do specific policies and regulations affect the relationship among the mobile telecommunications companies?

Addressed elsewhere in the interview

11. .Is there much mobility of people between senior positions in the bureaus and the mobile carriers?

Addressed elsewhere in the interview

12. If 'yes', under what circumstances do such movements occur?

Addressed elsewhere in the interview

13. and the availability of resources of the entrance of Vodafone (foreign owned)?

Addressed elsewhere in the interview

14. What changes would you expect to see, as a result of the Japan Fair Trade Commission becoming independent (again) of MPHPT in April 2003?

Addressed elsewhere in the interview

15. Has the government assisted the mobile services industry or influenced its development in any way that you know?

Addressed elsewhere in the interview.

6. Transcript for interview with Mr. Fujino

Interviewee	Mr. Fujino (F) (Pseudonym) Mobile carrier, senior executive
Interviewer	Chui Yin Lam (L)
Date and time	5th Feb 2005 2pm - 3pm
Venue	Conference room in Mr. Fujino's company
Recording Media	Hand written note and taped with digital recorder
Interviewee's language	Japanese, with interpreter

This interview focused on the question of competition and follow-up questions based on the informant's response.

L: How do you define competition?

F: It is very difficult to define competition, particularly for the mobile industry. The mobile in Japan is one of the most competitive industries in Japan.

L: Why do you think it is competitive?

F: In the mobile industry, there used to be multiple carriers in Japan. In the Tokyo metropolitan area, at the peak there were 7 carriers, now we have three. Because of competition some carriers have gone, some remain in the industry.

L: You mean it was competition that caused the number of carriers to decrease?

F: Yes. But wireless business needs radio spectrum to operate their business, and spectrum is a limited resource. The government tries to work out how to best utilize the resource. So it is not pure free competition. It is a little bit controlled or controllable competition.

For example in the US, spectrum is allocated by auction and spectrum is sold and bought on the market. I don't think it is successful in the US. We are aware of this type of system but we do use this system.

Mobile carriers in Japan compete within a controlled environment.

L: How about compared to 10 years ago when there were more mobile operators? Didn't they need more spectrum bandwidth?

F: Back 10 years ago, the operators offered PHS service, which use different spectrum from what the 3G operators are using today. Back then, the spectrum was sufficient. The total subscriber size in Japan was much smaller, thus operators needed much less bandwidth. Mobile operators now need more spectrum bandwidth.

L: How do you see the competition in the industry?

F: If you are referring a market as a competitive market when there is freedom to join and leave the market. It may not applicable to the mobile market. But because the mobile service industry offers services to the public, the industry needs to be controlled. A company can't join the industry today and leave the market tomorrow. If it is the case, the public would be confused and adversely affected.

I think there are two tribes; the farming tribe and the hunting tribe. The mobile market is not a world for the hunting tribe, it is a world for the farming tribe. Spectrum is a limited resource allocated to the mobile carrier, it is as if you are given a fixed size of farm land to work on. But this does not mean that all conditions have been pre-determined. There are often factors affecting competition. For example how you can effectively and efficiently use the land to create or yield the product. You have to be creative and do a lot of work to compete with others so that you can have a better yield.

There are people who say that there is no competition under such conditions. But I believe even though the mobile service industry is run within a controlled environment, there is competition among the carriers.

L: The farming and hunting comparison is very good. What do you see as the result of competition?

F: The result might be solely contributed by competition. The mobile service industry in Japan is the most advanced in the world. If you look at the result of competition, it is the success in the mobile industry.

L: What the changes in the mobile industry have you seen as a result of competition over the last 10 years?

F: As a result of competition, I can observe that : (1) tariffs went down, and (2) technological advances evolved.

It is very often said that in Japan, mobile tariffs are still high compared to worldwide standards. But if you look at other expenses in Japan, I don't think the tariffs are particularly high. For example, it is expensive to rent space to set-up a base station in Japan. If you take all the factors into consideration, the payment (money) involved is well balanced. For example, the roof top rental for setting-up a base station in Roppongi might cost several hundreds of thousands Yen per month.

L: Do you think as compared to 1994 that was a significant change to legislation? Since then mobile users in Japan could start owning their handsets. Since 1994 the mobile penetration rate in Japan has enjoyed an exponential growth. Is today's competition more intense than10 years ago? There were 7 mobile carriers then, but now there are 3 mobile carriers.

F: The mobile industry is getting saturated. Therefore my feeling is that the competition is fiercer and more intensive than 10 years ago.

As for the handset sales, the market now is bigger than the one in 1994. Everybody expected the market to expand. The Telecommunications Ministry then wanted to expand the market through deregulating handset sales, everybody wanted to deregulate . But it was known that Japan was behind other countries in this aspect.

There are reasons behind the timing of this deregulation. One of the reasons is that when considering the transition to 2nd generation system. The earlier system was analogue system and the market was monopolized by NTT. When new carriers came into the market of 2G mobile services, commercial service offered on 2G network was about to be ready. If you deregulate handset then, 2nd generation handset will be liberated. That means it will be completely liberated. This was one option.

And another option is to make all free from spectrum. It was hard to judge which is better. If 1st generation analogue mobile customers had purchased analogue handsets, it was believed that as customers would continued to own the handset, it would be harder to get the customers to migrate to the 2G service. If customers could own their handset, they would like to use the handset as long as they could. Therefore, both government and carriers hesitated to make it happen. However, the result was that we agreed that all handset to be ownable by customers.

The first generation handset issue was not going to be big deal. When we think about it now, the reason is that the market expansion for 2G was overwhelming.

The second reason was that the 2G handset is much better, smaller, battery life is longer and lighter. Therefore customer would naturally migrate to 2G service. If the 2G handset technology has not been so advanced (i.e. 2G handset is smaller to 1G handset), the 1st generation handset ownership issue might have been problematic.

In 1994, a new handset cost JPY 100,000. It was very expensive. Some people thought they would be better off having the carrier pay the cost of the handset while they paid a few thousand Yen per month. But eventually handset costs went down significantly.

L: Talking about the migration from 1G to 2G, how do you see the migration from 2.5G to 3G? Is it much slower than you expected?

F: I don't think it is that slow compared to other countries. But, the current migration is more challenging then the migration 10 years ago. Because it is more difficult to reduce tariffs now than before. When the migration to 2G was taking place, the market was in an expansion stage. We had the freedom to reduce tariff. 1G tariffs were high, 2G tariffs were getting cheaper, so naturally customers migrated from 1G to 2G.

For the migration from 2.5G to 3G, what we can do is to offer 3G specific services. For example value-added services such as high speed data transmission, TV, telephony and more content over the 3G services.

L: Do you see that 3G is going very strong in Japan?

F: I think so. Let's look at why we need to migrate from 2G to 3G. When you look at the technology cycle, 3G is more cost efficient than 2G. That means there is room for cost reduction.

L: Do you mean the operations cost or the customer's payment?

F: Equipment cost. Otherwise you never want to spend money on R&D. Of course, there are technical challenges in 3G technology R&D, however, if the 3G is successful, we should be able to see cost reduction.

In the end the migration to 3G will be completed. During the 1G to 2G migration, the 1G customer base was small, but not now for the 2G to 3G migration. The existing 2G customer base is big. If there were a total migration from 2G to 3G within one year, carriers would need to double their capacity. Therefore we need to control the speed of migration.

In the European market, it is easier than in Japan. They have 2G on a GSM network. They can add the 3G service onto their network, bit by bit. Of course they have dual mode handsets as well. Therefore, it is possible for them to expand their capacity gradually.

In Japan, we are using PDC for 2G which is unique and completely different from the 3G network. That means carriers need to have dual networks.

Carriers are not able to build new networks immediately. Therefore there will be a handicap between 2G and 3G. That's the challenge that we have in Japan.

L: Has any legislation or regulation helped to open up the mobile market in Japan?

F: Telecommunications business law was effective 2 to 4 years ago. Since then there has been competition in the fixed line business. I don't think that there is any legislation in particular to open up the mobile industry.

I think they are using the same approach in the mobile market, which means they (the government) first deregulate the fixed line market, to

allow new entrant to join the market. Then the government applies the same approach in the mobile market.

L: Do you think it has been enough?

F: It goes back to the earlier question on spectrum. It is difficult to determine what is the best way to allocate spectrum fairly.

L: What do you think of the Japanese government giving away the 3G license to NTT Docomo, Au and J-Phone? Only three of them. Do you think this encourages competition?

F: There were only 3 carriers then. They (the Government) did stop the competition. It is hard to judge but if there are more carriers, then the spectrum allocation to each carrier will be smaller.

In Japan, spectrum is allocated to 3 carriers only. The spectrum they have is wider than overseas carriers. That means carriers in Japan can offer high speed services with better quality.

I think monopoly is not good. Because there is no competition and efficiency is not good. As there are more carriers, efficiency will be improved, but there should be an optimum point.

L: How do you see the government legislation affecting the relationship among the carriers? I would like to separate it into 2 phases. First one is before Vodafone bought into J-Phone, and after Vodafone bought into J-Phone.

F: I don't think the relationship among the carriers has changed since Vodafone joined the industry.

But, when I look back communication between carriers has become less and less, since more than 6 years ago.

L: What sort of communication did you have?

F: There was no specific rule before. Carriers just came together to discuss what was the best way to do things. Because we had no choice but to discuss with one another. But with more rules coming in, there is less and less communication between the carriers, because we are afraid of violating the anti-monopoly law.

L: Do you think it is (dis)advantageous to the industry that there is less communication among the carriers?

F: I think so.

There is now an association of telecommunications, in this association there are fixed-line and mobile operators. In this association there is a forum to discuss mobile specific problems or issues. But we need to be members of the committee or association to join the discussion. But

previously, for example, carriers came together to discuss how to deal with changing from 10-digit to 11-digit of dialing numbers. Carriers didn't hesitate to talk to one another. We have fewer opportunities like that now.

L: I know there is some cooperation among the carriers, e.g. technology cooperation among carriers?

F: The situation is very different now. We try to do it, for example with mobile number portability which is likely to be launched next year, carriers need to cooperate to make it happen successfully. But on the other hand, we need to be careful about anti-monopoly laws.

I think we need to be more open to cooperation rather than worry about the anti-monopoly laws or anti-collusion laws.

L: At the end of the day, each carrier is connected to each another. If the carriers can't talk to each another, things will be difficult.

F: I agree.

L: What are the most significant steps taken by MPHPT?

F: I don't know whether it is the most important, but the deregulation in 1994 in mobile handset ownership was important.

And now, the carriers do not need to get permission from the MPHPT for changing tariffs. Now all you have to do is submit the tariff before you want to change it. But this has been done overseas for many years. It would be good if we had this earlier in Japan. This sorts of things does help carriers to move on.

L: For the fixed line there is asymmetric legislation. In the mobile, how is this situation?

F: There is no asymmetric legislation in the mobile area, there is "dominant carriers regime".

This means in a local area, if you have more than 30% of the market share, you will be the dominant carrier; you will be monitored. This is not asymmetric, but it ends up NTT Docomo is the dominant player, except for Okinawa Cellular. Okinawa Cellular is doing very well in Okinawa and they have more than 30%, market share but they have applied for exemption.

L: [Mr. Fujino] did you have any preferential treatment from NTT when you were in NTT Docomo? In terms of arranging the interconnection, was it easy?

F: Not at all. There were instructions from the government asking NTT and NTT Docomo to deal with carriers fairly and NTT and NTT Docomo followed such instructions.

L: How effective is MPHPT promoting industry level performance?

F: Not at all.

L: It doesn't help. But did it hurt?

F: It doesn't hurt, but they could have done things earlier which they didn't.

L: What do you think are the reasons for the MPHPT delay some of the legislation (de-regulation)?

F: I don't think it is their intention to delay. If things are done according to the carriers wishes, there would not be much value in the existence of the MPHPT. It is not easy for the Ministry to drive the carriers.

But because the Ministry is late in realizing what we want, that's why they have their value for existence. We [carriers) need to keep asking the Ministry to drive faster and faster.

L: Do you think the MPHPT has an overall strategic direction for the mobile industry?

F: It is difficult for them to have overall strategic direction because it is not just MPHPT.

In MPHPT people are rotated very often. People stay in the mobile sector for around 2 years. And in the carriers people get moved around a lot.

Those senior people in MPHPT if they are high flyer, very likely, they will move within 2 years.

L: I asked this question because there are quite a few theories saying that the Japanese government led the post-war economic development in Japan. I wonder whether the Japanese government is steering the industry development in the mobile sector?

F: No. I don't think this is the case now.

When we came to discuss about competition, I wonder how I should consider competition. In general, more intensive/severe the competition environment is, the better. Most people say that. But in the mobile business you need to invest a lot of money in infrastructure. That's my assumption. There are 3 carriers now. If there were 4th and/or 5th entrants, they would think that were going to be the winner. They would forecast higher market share than the one they would get. For example, 100% capacity is the most desirable and they might over-build capacity.

As I said earlier if there were more carriers the situation might be worse. And capacity might be over-built. As I said earlier as the number of carriers increase the situation might get worse as a result of government intervention.

The situation we are in is one of low government involvement and medium-high competition. There is competition in the industry, but in the public perspective it is not very competitive or too serious. If the assumption is that there is small investment to be made by each player, then you might think the more players, the more intensive the competition gets. The market will keep vitalizing itself.

When you come to the mobile business we are moving from 2G to 3G service, carriers need to keep investing. If there are too many carriers spending too much money, then it will be inefficient. The competition might not be worthwhile.

I hope you will take that into consideration, when you are considering your scenario. I believe the level of competition is going up, because Softbank and other new entrants are looking to get into the market.

Glossary

1G	The first generation of analogue mobile phone technologies including AMPS, TACS and NMT
2.5G	The enhancement of GSM which includes technologies such as GPRS
2G	The second generation of digital mobile phone technologies including GSM, CDMA IS-95 and D-AMPS IS-136
3G	The third generation of mobile phone technologies covered by the ITU IMT-2000 family
ADSL	Asymmetric Digital Subscriber Line; ADSL is a form of DSL, a data communications technology that enables faster data transmission over copper telephone lines than a conventional voiceband modem can provide.
Bandwidth	A term meaning both the width of a transmission channel in terms of Hertz and the maximum transmission speed in bits per second that it will support
CDMA	Code Division Multiple Access; also known as spread spectrum, CDMA cellular systems utilise a single frequency band for all traffic, differentiating the individual transmissions by assigning them unique codes before transmission. There are a number of variants of CDMA (see W-CDMA, B-CDMA, TD-SCDMA et al)
CDMA 2000	A member of the IMT-2000 3G family; backwardly compatible with cdmaOne
CDMAone	The first commercial CDMA cellular system; deployed in North America and Korea; also known as IS-95
Cell	The area covered by a cellular base station. A cell site may sectorise its antennas to service several cells from one location. Cell site is the he facility housing the transmitters/receivers, the antennas and associated equipment
C-mail	Similar to SMS, operated by KDDI au, which cannot be communicated to mobile users outside of KDDI au network
Dcomo's FOMA	Freedom of Mobile Multimedia Access; is the brand name for the 3G services being offered by

	NTT DoCoMo. It is the world's first W-CDMA 3G service when launched by NTT Docomo in 2001.
EDGE	Enhanced Data rates for GSM Evolution; effectively the final stage in the evolution of the GSM standard, EDGE uses a new modulation schema to enable theoretical data speeds of up to 384kbit/s within the existing GSM spectrum. An alternative upgrade path towards 3G services for operators, such as those in the USA, without access to new spectrum. Also known as Enhanced GPRS (E-GPRS)
Ezweb	Mobile Internet online platform operated by KDDI au
FCC	Federal Communications Commission; the US regulatory body for telecommunications
FTC	Fair Trade Commission; Japanese fair trade regulatory body
GHz	A unit of frequency equal to one billion Hertz per second
GPRS	General Packet Radio Service; standardised as part of GSM Phase 2+, GPRS represents the first implementation of packet switching within GSM, which is a circuit switched technology. GPRS offers theoretical data speeds of up to 115kbit/s using multislot techniques. GPRS is an essential precursor for 3G as it introduces the packet switched core required for UMTS
GPS	Global Positioning System
GSM	Global System for Mobile communications, the second generation digital technology originally developed for Europe but which now has in excess of 71 per cent of the world market. Initially developed for operation in the 900MHz band and subsequently modified for the 850, 1800 and 1900MHz bands. GSM originally stood for Groupe Speciale Mobile, the CEPT committee which began the GSM standardisation process
HSPSD	High Speed Packet Switched Data; the interface between the Node B and the RNC in a UMTS network

i-mode	i-mode is a wireless Internet service developed by NTT Docomo
IMT-2000	The family of third generation technologies approved by the ITU. There are five members of the family: IMT-DS, a direct sequence WCDMA FDD solution IMT-TC, a WCDMA TDD solution IMT-MC, a multi-carriers solution developed from CDMA 2000 IMT-SC, a single carrier solution developed from IS-136/UWC-136 IMT-FT, a TDMA/TDD solution derived from DECT
ITU	International Telecommunications Union
Japan!	Mobile Internet online platform operated by J-Phone.
J-Phone	A mobile telecommunications carriers in Japan, subsequent sold to Vodafone, and as of 2007, this business is owned by Softbank.
KDDI au	KDDI is telecommunications operator in Japan, *au* is the brand for its mobile telecommunications service.
MIC	Ministry of Internal Affairs and Communications; previously called Ministry of Post, Home and Telecommunications (MPHPT)
MITI	Ministry of International Trade and Industry, which is now named as Ministry of Economy, Trade and Industry (METI)
MVNO	Mobile Virtual Network Operator
NTT Docomo	NTT Docomo is the incumbent mobile telecommunications carrier in Japan
OSI Model	Open Systems Interconnection; a seven layer model for protocols defined by ISO
PDC	Personal Digital Communications; a digital cellular technology developed and deployed uniquely in Japan. A TDMA technology, PDC is incompatible with any other digital cellular standard

PHS	Personal HandyPhone System/Phone; a digital cordless technology developed in Japan which achieved great success. Deployed by NTT DoCoMo and other Japanese operators PHS offered two-way communications, data services and Internet access and eventually won some 28 million customers. Now in decline as cellular's wide area capabilities offer better service
Roaming	A service unique to GSM which enables a subscriber to make and receive calls when outside the service area of his home network e.g. when travelling abroad
Sha-mail	Sha-Mail (写メール) is a kind of mailing service of J-Phone (now Softbank). This term is made from Sha, which is the front part of a Japanese word Shashin meaning photograph, and Mail. Sha-Mail is used to send pictures and/or email through mobile handsets.
Softbank	SoftBank Corp. is a Japanese telecommunications and media corporation, with operations in broadband, fixed-line telecommunications, e-Commerce, Internet, technology services, finance, media and marketing, and other businesses.
Spectrum allocation	Use of radio frequency bands of the electromagnetic spectrum is regulated by governments in most countries, in a process known as frequency allocation or spectrum allocation.
Spectrum assignment	Government authorization for use of specific frequencies or frequency pairs within a given allocation, at specific geographic locations.
TDS-CDMA	Time Division-Synchronous CDMA; a CDMA variant developed by Chinese vendors which is claimed to offer high data rates and greater coverage
Tu-ka	A subsidiary company of KDDI, was a 2G PDC cellular operator which did not apply a 3G license. TU-KA was closed in March 31, 2008.

UMTS	Universal Mobile Telecommunications System; the European entrant for 3G; now subsumed into the IMT-2000 family as the WCDMA technology.
Vodafone Japan	Vodafone Japan owned J-Phone business between 2003 to 2006.
WCDMA	Wideband CDMA; the technology created from a fusion of proposals to act as the European entrant for the ITU IMT-2000 family. W-CDMA (Wideband Code Division Multiple Access) is a type of 3G cellular network. W-CDMA is the higher speed transmission protocol used in the Japanese FOMA system and in the UMTS system, a third generation follow-on to the 2G GSM networks deployed worldwide. More technically, W-CDMA is a wideband spread-spectrum mobile air interface that utilizes the direct-sequence spread spectrum method of asynchronous code division multiple access to achieve higher speeds and support more users compared to the implementation of time division multiplexing (TDMA) used by 2G GSM networks.
WRC	World Radio Conference ; also known as World Administration Radio Conference (WARC); an ITU conference held at regular intervals to determine the allocation of spectrum for various services

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