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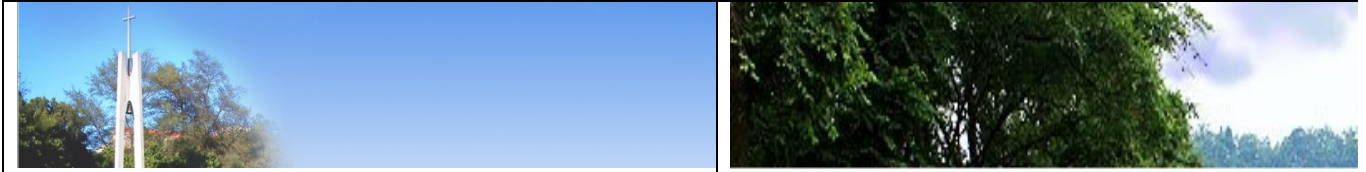
**“Corporate restructuring issues under
the holding company structure – The
NTT Case in Japan”**

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Title:

Corporate Restructuring Under The Holding Company System –NTT Case

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Abstract

This research paper focused on the corporate restructuring of Nippon Telegraph Telecommunication (NTT Group) under the pure holding company structure in 1999 and its implications. In order to understand the holding company structure, we introduced the concept of "internal capital markets" and explained its application within the framework of NTT Group.

Next, we gave an account of the background events leading to NTT Group's corporate restructuring in order to understand the reason for choosing and keeping the holding company structure. Our research methodologies include interviews with NTT Group's management and data from public sources.

Finally, to analyze the effect of the holding company structure to NTT Group, we conducted a hypothetical valuation analysis using the free cash flow model. Comparing the market value of NTT Group with our valuation results, it appeared that the market has undervalued NTT Group. We concluded our report with some suggestions on how NTT Group might be able to increase their market value.

Introduction

The term "holding company" is used to describe a corporate organizational form which does not produce goods or services by itself, but its sole purpose is to own shares of other companies. Usually, the holding company holds enough stocks to control ownership and operations of related companies. In some cases, the holding company owns some companies outright. This structure allows the holding company to control a number of related but legally independent companies. It also allows the diversification of risk for the owners and management.

There are two types of holding companies, namely "pure holding company" and "operating holding company". The function of the former is as a pure investment company holding other companies' shares to control. It typically does not have its own operations. The operating holding company type, on the other hand, has its own operations in addition to holding other companies' shares to control.

In the United States, the holding company structure has been losing popularity in the recent years. In Japan on the other hand, it has become more popular as a simple strategic combination of diversification and integration. The holding company structure forms the basis for so called "internal capital markets" for all the member companies within the same group.

Internal capital markets are said to function when a subsidiary with high growth

potential does not have access to external markets, or in a developing country without a well-functioning capital market. Creating internal capital markets may create value for the group as a whole under certain capital or other resource market conditions.

Internal capital markets often help companies to overcome imperfections in external markets. Multinational companies for example, use internal capital markets when direct financing in external capital markets is too costly for their subsidiaries. Internal capital markets may also function to fund their subsidiaries in jurisdictions providing weak creditor protection, drawing on capital from operations located in countries offering strong creditor protection. This may give multinationals significant advantages over local competitors in locations where credit markets are poorly developed.

In addition, the holding company structure enables multinational firms to respond to tax incentives and to minimize overall tax by adjusting loans between parent and subsidiaries. It thus creates tax planning opportunities not available to their local competitors. The sensitivity of parent loans to tax rate differences indicates the extent to which firms manage their internal finances to exploit these opportunities.

From the above explanations, we understand that forming a pure holding company is equivalent to forming internal capital markets. NTT Group, under the holding company structure, has 7 major group companies including NTT East, NTT West, NTT DoCoMo, NTT Communication and NTT Data. In other words, the holding company structure exists when

the formation of internal capital markets is required. NTT, although not a multinational company, is highly integrated across different operations. Therefore, the concept of internal capital markets is still applicable to NTT Group.

"Diversification discount" is one of the issues when we discuss the holding company structure. The diversification discount refers to the decrease in the market value of a company when the focus of the company becomes hazy as a result of diversification into many different areas. The diversification can potentially lead investors operationally to confusion when they analyze company's operations and financial performance. Looking at NTT, we see that its major business used to be fixed line telecommunication services. As a result of technological shift from fixed line to mobile and VoIP during the 1990s, NTT diversified around the new technological trends.

The diversification discount can also occur through the allocation of capital and other resources across different subsidiaries. If there are unprofitable subsidiaries inside the holding company, the resource allocation of the group basically flows from a profitable to an unprofitable subsidiary. Hence, the conflict between the parent company and the management of the subsidiaries in terms of resource allocation can potentially contribute to the diversification discount.

The holding company structure in Japan exists not only as a source of capital but also increasingly for strategic purposes. By creating the holding company structure, different

subsidiaries in the group can work towards achieving the same goals based on group's consolidated strategies. Alternatively, the group can also deploy existing employees to different subsidiaries based on required needs using internal restructuring.

NTT's History of Corporate Restructuring

From establishment to privatization (1952 - 1990)

Nippon Telegraph Telecommunication (Denden Kosha) was established in 1952 as a government-owned corporation in order to meet rapidly growing demands for fixed line telecommunication services.

However, since decision makings at NTT were highly constrained by the government, it was difficult for it to adjust to environmental changes during the first half of the 1980s.

Hence, NTT was incorporated as a private company in 1985 and regulated under NTT Law.

It was stipulated that NTT's organizational form should be reviewed in 5 years after the privatization in 1985.

At the time of NTT's privatization, the telecommunication industry was liberalized in order to facilitate competition. As a result, New Common Carriers (NCC) such as KDD and DDI entered the market. There were 87 NCCs as of April 1985, and they were expected to increase (see Appendix 13). Responding to the change in industry's competition, NTT changed its organizational structure from a functional structure to an operational one.

In addition, NTT started to diversify its operational reaches. For example, NTT Data started its operations in 1988. However, NTT's activities have been strictly regulated under NTT Law. Under NTT Law, NTT is not only prohibited from entering international telecommunication markets, where only researchers and technology were exchanged with domestic carriers overseas, but also obliged to provide uniformly service in Japan even in rural areas where profitability could be low or even negative. This has led to the argument that NTT should break up its subsidiaries. Mainly the Japanese government, particularly the Ministry of Post and Telecommunication (MPT) was in favor of separating NTT, believing that the telecommunication industry would be liberated, allowing other competitors to enter the market. This might facilitate fair competition. The government was also under pressure from the U.S. to open Japan's telecommunications market to foreign carriers. On the other hand, NTT and its largest shareholder, the Ministry of Finance (MOF), opposed the break-up proposal. Critics believed that the separation of NTT might cause an increase in the price of local phone calls, a decline in service quality and international competitiveness, in addition to weakening R&D projects. Overall these problems could potentially cause a decrease in the wealth for shareholders. Since 1982, this argument has continuously been debated amongst major stakeholders such as NTT's labor union, political parties in Japan and the government. Naturally this continues to be a major concern for NTT's shareholders as well as their creditors.

One of the most important stakeholders for NTT is All NTT Workers Union of Japan (NWJ). NWJ was indeed the largest labor union in Japan. NWJ originally was created when 43,000 members of the *zendentsu* (Japanese Telecommunication Workers Union) formally organized. *Zendentsu* influenced more than NTT's management decision-making processes but also governmental decision-making processes. The policy participation of *zendentsu* could continue to influence the decisions of the government and the leading Liberal Democratic Party (LDP). For example, when NTT was privatized in 1985, it did not break up its subsidiaries. This move was a compromise between *zendentsu* (in collaboration with NTT management), the LDP and the government. NTT when eventually broke up its subsidiaries, *zendentsu* was influential. *Zendentsu* ensured employees that their standard of living remains fixed, even after they were relocated to different divisions or subsidiaries.

In 1987, NTT went public and was listed on the First Section of the Tokyo Stock Exchange. The government, specifically MOF, which had held 100% of NTT shares, offered 25% (1.95 million shares) to the public. At this time, MOF was required to keep more than 30% of NTT outstanding shares. Naturally, as MOF drops their holdings of NTT shares, their business interests in NTT decreases as well (see Appendix 8).

Reorganization Period (1990 - 1999)

Background to the holding company structure

The mid-1990s was a pivotal period for the Japanese mobile telecommunication industry. When the mobile phone was first introduced in 1990, business was its main use. Personal use for mobile phones is rapidly on the rise. As a result, the total number of subscribers to mobile phones surpassed the number of new subscribers for fixed-line telephones in June 1994.

The Japan telecommunication industry itself underwent drastic changes during the 1990s. Competition from foreign companies increased in the mid-1990s because foreign companies were allowed to enter the Japan telecommunication market.

The Japan's telecommunication market can be divided into local, long-distance, and international communications along with mobile phones. A turning point for NTT occurred in December 1996 when its monopoly on local services ended. After this, NTT needed to look at the global telecommunication market more closely. During this period, the existing trend calls for an increase in the scale of operations within the global telecommunication market, through mergers and player consolidation. In November 1996, for example, British Telecom (BT) announced its decision to acquire MCI Communications in the U.S. and became the 4th largest carrier in the world. There were concerns among political leaders and MOF that NTT might not be able to compete in the international arena. The government, who owned the majority of NTT shares successfully amended the NTT Law and approved NTT for

international services. By 1997, NTT had obtained an operating license in France, the United Kingdom, Singapore and Hong Kong.

At the same time, the government, LDP and the Fair Trade Commission started to discuss the possibility of forming a holding company which was previously illegal according to the anti-monopoly law¹ in Japan. NTT itself also felt it was necessary to restructure its organizational form so that NTT could adapt to the rapidly changing business environment.

To cope with the shrinking of fixed line services, the growing mobile market and VoIP services, and the intensifying mega global competition NTT tried to expand its interests to broader telecommunication areas. By alternating its previous form to the holding company structure, NTT believed that it could create value for shareholders. They believed that this form give them more flexibility and allow them to quickly react to changes. In addition, the scale of NTT's competitive R&D would allow NTT greater access to financial and international markets.

On December 6 1996, MPT announced the guideline regarding NTT's reorganization.

Following this announcement, NTT's stock price increased dramatically over the next week weeks from 845,000 yen to 916,000 yen. This increase of 8% reflected investors' strong confidence in NTT's reorganization into a holding company structure.

¹ The revised Japanese Anti-monopoly Law (Law No. 54 of April 14, 1947, amended by Law No. 87 of June 18, 1997) took effect on December 17, 1997, and under Article 9, establishment and operation of a holding company is now permitted.



On July 1 1999, NTT officially registered as a holding company. Four days later NTT's stock price reached a high of 1,540,000 yen. Even as early as a month before the announcement, NTT's stock price began to steadily raise starting at a low of 1,190,000 yen on June 3 and reaching an average of 1,475,000 yen during the month of July. This was a substantial increase in NTT's stock price, about 22%, in only two months. Investor's strong confidence in NTT's new holding company structure can be accredited for this.



After the reorganization, the Research and Development (R&D) department became a centralized part of the new NTT Holding Company. The centralized R&D unit focused primarily on simplistic R&D projects, and applied its technological findings to all subsidiaries, with the exception of NTT East, West and Communications, which have their own research divisions.

NTT's labor union, *zendentsu* also underwent a structural change, like its parent company. In December 1998, the labor union altered its structure at NTT when *zendentsu* became a company-based structure, rather than maintaining its traditional region-based structure. To reflect its new organization, *zendentsu* changed its name to All NTT Workers

Union of Japan (NWJ). Even though, the internal structure may have changed, the scope of the union remains largely the same.

Classification of NTT group companies

Following the reorganization, NTT company groups were classified into two different categories, regulated and unregulated. NTT's regulated subsidiaries consist of two regional units, NTT West and NTT East, which are completely controlled by NTT Law. NTT West and NTT East are obligated to provide uniform services to the whole of Japan regardless of profitability. On the other hand, NTT's unregulated units were divided into three categories: profit seeking, utilization of resources, and new business development as shown in the tables below.

Group		Subsidiaries	Form
1	Regulated	East and West	Special
2	Profit seeking (unregulated)	Communication, Data, DoCoMo	General
3	Utilization of resources (unregulated)	Facilities, ME, ComWare	General
4	New business development (unregulated)	Finance, NTT Electronics, NTT UD	General

Group		Mission
1	Regulated	Upgrading and diversifying services for reasonable price
2	Profit seeking (unregulated)	Expanding telecommunication services
3	Utilization of resources (unregulated)	Increase efficiency in entrusted operation
4	New business development (unregulated)	New business development outside group's main businesses

The strategic goal for NTT is to maximize its synergy through the effective use of the managerial resources from each of its company groups. In the future, for example, NTT's two regulated units were forecasted to be unprofitable so NTT reallocated the appropriate human resources through its company groups in an attempt to optimize its internal resources

In terms of internal communication structure, NTT introduced three platforms to help facilitate group management skills and techniques. NTT used contracts to regulate how its company groups will function together, thereby creating a common strategic implementation plan and enhancing management transparency. In addition to these changes, the holding company and each company group develop its own business plan. All the business plans were discussed together during which strategies were shared, as well as the issue of optimizing internal management resources. The presidents of each of the company groups conducted many meetings in order to share and determine the direction the company should take as a whole.

From these meetings NTT developed new laws that would govern its group companies. The first of which was enacted in 1997, called the New NTT Law, which allowed company groups to provide international services, including in the communications industry. NTT's policies for international expansion were to lay the foundation for further expansions,

by allowing each company group the opportunity to seek growth based on its own business needs. As a result, NTT Communication started providing international communication services and NTT DoCoMo began to provide their I-mode license (mobile internet service) overseas. I-mode was started in 1999 in Japan by DoCoMo and it boosted both DoCoMo's and the group's performance substantially.

Although the New NTT Act of 1997 introduced an international strategy it was still not fully integrated, because each company group began to pursue their own interests before those of the company. Perhaps this is one of the reasons that NTT's international expansion failed overall.

Post Reorganization Period (1999-2005)

For NTT's competitors, this new holding company structure held no competitive advantage for NTT. IN the U.S. when AT&T was forced to break up in the 1980s it helped clear AT&T of telephone monopoly charges. No such benefit was in store for NTT. In the case of NTT, after restructuring, NTT still held nearly 90 percent share of Japan's telecommunications markets. In the same respect, NTT DoCoMo also controlled a 57 percent share of Japan's mobile phone market (as of 1999).

In late 1999, the Japanese government slowly put pressure on NTT to lower its prices. NTT's control of Japan's telecommunication infrastructure caused higher prices compared to that in the U.S. and European countries. For example, installation of a fixed telephone line costs nearly 11 times more in Tokyo than in New York, and Japan's internet users paid five times more than Americans or Europeans in 1999. So under governmental pressure in late 1999, both NTT West and NTT East started to offer common price for ADSL internet services with approximately monthly fee of ¥6,980 which is still higher than ¥4,718 in the U.S. However in 2001, the fee has dropped to ¥4,100 which is lower than ¥5,899 in the U.S. (see Appendix 12).

In addition to governmental pressure to liberalize the telecommunication industry, domestic price competition also intensified. As a result, NTT found it more difficult to retain its profitability in each subsidiary. The intense competition triggered a wave of mergers and consolidations within Japan's telecommunication industry. In 1999 for example, Japan Telecom (JT) Group integrated long-distance and international carrier Japan Telecom and mobile phone operator J-Phone Group. Also in October 2000, KDDI was established by international carrier KDD, long-distance carrier DDI, and mobile operator IDO as the country's second largest integrated communication carrier (following the NTT Group), with consolidated sales in excess of two trillion yen (see Appendix 10).

The deregulation of foreign direct investment in the Japanese telecommunication

industry resulted in the increase of competition. For example, Cable & Wireless acquired International Digital Communications (IDC), and AT&T and British Telecom had a 30 percent stake in Japan Telecom.

In conclusion, from the end of 1990s to 2001, because of increased competition and slow technology innovation, NTT's performance was not at its best (see Appendix 8). NTT also cut its spending on fixed lines in response to the slow-down in demand. In 2001, NTT launched a three-year business plan for restructuring its regional phone companies and shifting its focus to internet services such as asymmetric digital subscriber line (ADSL).

Change in Technological Trends

The technological trends for the telecommunication industry are significant increases in demand in mobile and internet (broadband and wireless) services (see Appendix 4). It is expected that from the 2000s, broadband and optical access will become mainstream with the support of fixed-line integration and wireless systems. The changes in technological trend are reflected in NTT's fixed-line convergence integration strategy.

On the other hand, the decrease in the number of fixed-line subscribers is expected to be further accelerated. This trend is also supported by the development of internet technology especially development of VoIP (Voice over Internet Protocol) which grew in tandem with broadband technology development. It is predictable that in the future of communications, there will be a shift from fixed lines to IP networks.

According to NTT's income statements from 1997 through 2001 (see Appendix 11), operating revenues consist of telephone, telegraph, leased circuit, data communication facility, ISDN services, sale of telecommunication equipment, and miscellaneous. We see that only the telephone business shows a decreasing trend. The operating revenues from the telephone business in 1997, 1998, 1999, 2000, and 2001 have been decreasing from ¥98,683 million, ¥92,211 million, ¥85,521 million, ¥82,631 million, ¥78,903 million respectively (see Appendix 9).

With the development of internet technology, broadband internet access such as ADSL has become one of the major changes in 1999. However, as the demand for the fixed lines gradually decrease, services like ADSL that depend on the fixed line is also expected to gradually decrease.

Internal Restructuring

NTT East and NTT West employees were transferred as part of NTT's internal restructuring which is consistent with the "internal capital markets" theory (see Appendix 7 and 8). Those transferred employees, aged 51 and over, retired from NTT East and NTT West were rehired by outsourcing companies with a 15% to 30% reduction.

In 2001, All NTT Workers Union of Japan (NWJ) decentralized collective bargaining which meant that except for basic work conditions, each company-level union has the right to bargain over all other related issues. Therefore, NWJ had two levels of bargaining,

central (headquarter) and company level (branch/subsidiary). "NWJ HQ retained the right to negotiate all terms, including both substantive and procedural issues, with each of the eight key group companies, with a view to arriving at an identical agreement for all", Sako and Jackson (2003) ² .

In November 1999, NTT announced its structural reform plan which included an increase of employee reallocation from 4,000 to 6,500 approximately. This referred to the human capital movement from NTT East and NTT West to other parts of the NTT group. In addition, NTT East and NTT West released what they called a medium-term restructuring program, which aimed at reducing both the number of employees and capital spending. The number of employees was scheduled to decrease by 28,000 until the end of fiscal year 2002 and the capital investment amount was planned to decrease by 900 billion yen. As part of this plan, an evaluation system for assessing employee's performance and wage would also be introduced from April 2001.

In addition to employee reallocation, the holding company structure could also facilitate the divestiture of non-core businesses through equity carve-out. For example, in 2004, NTT carved-out NTT Urban Development which focused on real estate development. However, the new carved-out entity was not free to decide its own business strategies because they still had to be in line with the parent's business strategies.

² Enterprise Boundaries and Employee Representation: Deutsche Telekom and NTT Compared. RIETI Discussion Paper.

It is clear that there is a need for NTT to maintain its holding company structure with its present group operations. In the case of NTT East and NTT West, the holding company structure helps facilitate structural reforms in order to revise the cost structures. However, this synergy from the holding company structure is not apparent at first glance for outside investors. It is difficult for them to value the synergy unless more information is provided by NTT.

This problem was seen when NTT announced its 3-year midterm strategy for 2000 to 2002 on Apr. 12, 2000. The market saw the negative synergy and hence reacted negatively. NTT's stock price went on a downward trend from 1,580,000 yen on the announcement date. On Apr. 28, NTT's stock price decreased significantly to 1,340,000 yen, resulting in a decrease of around 15% within a very short time period of half a month. This clearly shown that investors had lost confidence in NTT's midterm strategy. One of the factors for this was that high competition in the industry led to a reduction in internet service fees. Another factor was the crash of the dot-com bubble leading to a decrease in the overall market sentiment.



International Strategy

NTT's current international strategy focuses on the Asia market, including countries such as China and Vietnam. In terms of the types of business, NTT plans to expand globally in the fiber optics and mobile business.

Although NTT has some plans to expand globally, it has no major investment projects planned as yet. There are a few reasons why NTT is hesitant to have major investments overseas. First, NTT experienced a failed investment previously in the U.S. In 1998, NTT signed an agreement with Verio Inc., a U.S.-based internet service provider. It wanted to create global internet service for its corporate clients. As such, NTT bought Verio for US\$5.5 billion in 2000 at the height of the technology boom. However, due to waning demand for Web services, NTT had to take an extraordinary loss of 498 billion yen for its investment in

Verio during the first half of 2002. During the later part of 2002, NTT further wrote-down its investment in Verio by another 538 billion yen. Therefore, this strategic agreement resulted in huge losses for NTT.

Another reason is high competition in international telecommunication markets. Even in developing countries such as China, the telecommunication industry is fully or at least partially controlled by the government which creates a high entry barrier for foreign telecommunication companies. Even if the telecommunication industry is liberalized, competition is already very fierce with local companies.

The lack of expertise in the required technology in the international markets is yet another reason. Japan uses Code Division Multiple Access (CDMA) technology predominantly while most of the world uses Global System for Mobile Communications (GSM) technology predominantly. Hence, NTT lacks the expertise to compete in GSM-predominant countries. Even in CDMA-predominant countries like the U.S. and Korea, the market is very much matured and competition is already very fierce which makes it hard for NTT to break in.

Internal Capital Markets

How can NTT compete with pure play competitors? What are the challenges to compete with them? What are drawbacks or opportunities for NTT? Before getting to the discussion on this matter, we should understand what the constraints in NTT's operations are.

Stein (1997)³ argues that internal capital allocation from the holding company is more efficient compared to the use of external market sources such as bank loans due to the availability of inside information. The efficiency of capital allocation can be seen as how well the holding company allocates capital to its subsidiaries. He then concludes that the efficiency of internal capital markets depends on how well the holding company pick the winner. The winner in this respect means the subsidiary or project that can generate greater return regardless of the origins of the capital inside the firm. For example, even though most of the internal capital comes from NTT DoCoMo, it does not always mean that a large part of capital allocation will go back to NTT DoCoMo.

In NTT's case, we can see that the theory of internal capital markets is not perfectly put into practice under its holding company structure. The perfect practice of internal capital markets refers to the allocation of most of its capital from the holding company to the subsidiaries which can generate the biggest returns. However in practice, NTT still allocate its capital to the regulated subsidiaries when the more profitable subsidiaries should receive more capital. This means that even though the regulated units of NTT cannot generate big returns, NTT still have to give allocate priority of capital to them.

The holding company structure of NTT does not allow NTT to be a pure player while this serves as a self-guard system against outsider acquisitions. In addition, Japan's law prohibits foreign ownership holdings of more than one third of total shares for certain

³ Stein, Jeremy C., 1997, Internal capital markets and the competition for corporate resources, *Journal of Finance* 22,111-133.

industries such as the telecommunication industry. In 2000 for example, the government only held 45.9% of NTT shares but due to the above regulation, NTT faced no threat of foreign acquisitions.

Employee reallocation can also be viewed as a manifestation of internal capital market mechanism at NTT. Another reasoning behind the employee reallocation in NTT is that NTT tries to avoid cutting off their employees. This reluctance to fire or layoff employees is actually one of NTT's constraints.

Centralized R&D is also one manifestation of internal capital market mechanism at NTT. Depending on NTT Group's strategies, NTT allocates the output of R&D to the different subsidiaries. This centralization of R&D has certain drawbacks because R&D is more diversified as compared to when R&D is decentralized. The centralization of R&D is focused more on NTT Group's strategies, thus centralized R&D is relatively more out of touch with the market, resulting in less innovation and flexibility to meet the demands of the market. If R&D is decentralized, market research data could be analyzed and used more effectively and less distortion of information would occur.

Stein (1997)⁴ also argues that diversified firms can enhance capital allocation efficiency because corporate headquarters engage in reallocation of funds across projects. We can relate this to how NTT Urban Development (NTT UD) can create value for NTT as a

4 Stein, Jeremy C., 1997, Internal capital markets and the competition for corporate resources, Journal of Finance 22,111-133.

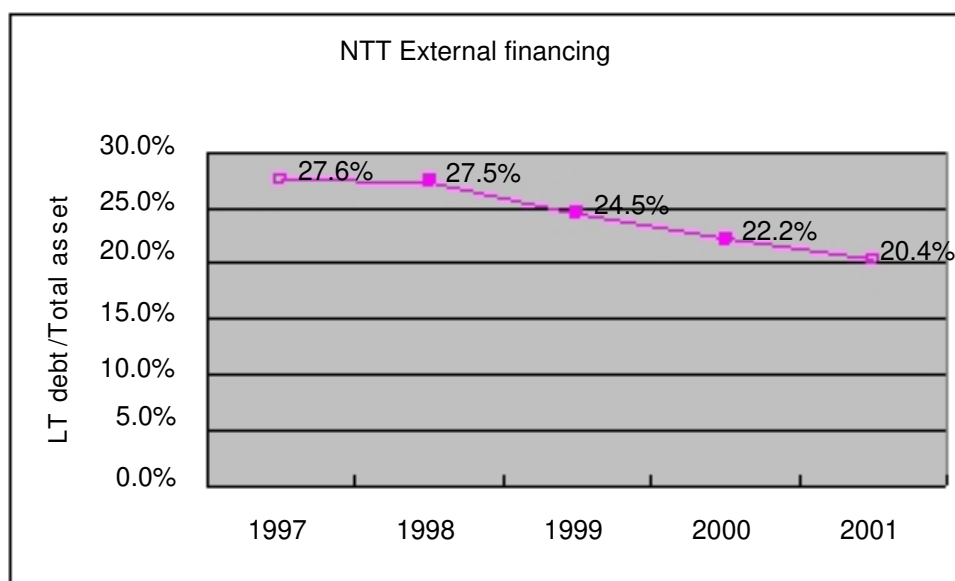
holding company. With its new business development unit (such as NTT UD, NTT Lease, NTT Finance, etc.), NTT can allocate its capital not only focusing on one single industry but also on different industries, such as real estate in the case of NTT UD.

In the case of NTT UD, we see that NTT used the capital raised from the initial public offering (IPO) of NTT UD in 2004 to allocate back to NTT UD to buy assets for NTT UD.

This is due to the promise of estimated returns from the real estate sector and shows clearly the effect of the internal capital market mechanism in NTT's holding company structure.

External Capital Markets vs. Internal Capital Markets

The figure below shows NTT's external financing from 1997 to 2001. NTT decreased its long-term debt to total asset ratio from 27.6% to 20.4%. Hence, NTT has gradually reduced its reliance on external financing such as bonds and bank loans. This means that NTT is gradually using more from its internal capital markets which provide more benefits than external financing does.



Valuation

The First Approach

We used the free cash flow (FCF) model to estimate the value of NTT Group, NTT DoCoMo and NTT Data. To calculate FCF, we used the company's cash flow statement and balance sheet. Basically, we started with the company's cash flow from operations and then estimated the capital expenditure required for current operations based on the company's annual report and mid-term strategies. Free cash flow is equal to the cash flow from operations subtracting the estimated capital expenditure required for current operations.

$$\text{FCF} = \text{Cash Flow from Operations} - \text{Capital Expenditure}$$

The base year used for our projection was the end of fiscal year 2000 which was the time of restructuring. We assumed that the sales growth from 2000 for NTT Group, NTT DoCoMo and NTT Data are 2%, 20% and 10% respectively according to the mid-term strategies. We used the historical risk free rate of 1.9% and the risk premium of 5.9%. We also calculated the market beta for NTT Group, NTT DoCoMo and NTT Data to be 0.77, 1.5 and 1.2 respectively based on historical data. For example, we calculated NTT's beta by using NTT's return on capital from 1994 to 2003 and the return of telecommunication industry during the same time period. We used actual data for other items such as number of debt capital, shares outstanding and current share price at the end of fiscal year 2000.

We estimated un-levered free cash flow and discounted it using WACC of each

company to get the total net present value (NPV). Then, we subtracted the value of debt capital to get the present value of forecasted cash flow for equity holders. The formula we used to estimate the present value of continuing value is: $PV_t / (r-g) * PV \text{ factor}$, with g: long term growth rate and r = WACC.

	<u>Valuation</u>	<u>Market Value</u>	
DoCoMo	7,575,663.17	86,510,320.00	Overvalue
61.5% DoCoMo	4,659,032.85	53,203,846.80	
Data	1,058,799.33	5,722,200.00	Overvalue
54.2% Data	573,869.24	3,101,432.40	
NTT	23,934,051.80	26,299,381.70	Overvalue
NTT (ex DoCoMo & Data)	18,701,149.72	(30,005,897.50)	Undervalue
Value Creation	48,707,047.22		

Based on our valuation, the market overvalued NTT DoCoMo and NTT Data more than 10 times, resulting in overvaluation of the whole NTT Group at the end of fiscal year 2000. We can see from the above table that the market value of NTT DoCoMo is higher than NTT Group: 86,510,320 million yen > 26,299,381.70 million yen. When we take out the 54.2% value of NTT Data and 61.5% value of NTT DoCoMo, the market value of the rest of the NTT Group became negative, -30,005,897.50 million yen. This phenomenon is very strange and is known as negative stub phenomena. Hence, if NTT breaks up its group companies, the hypothetical value creation would be 48,707,047 million yen (valuation result of 18,701,149 less market value of -30,005,897 million yen).

The Second Approach

In this approach, we estimated the value of NTT East, NTT West and NTT Communications, separately by using our free cash flow model based on their financial statements. Next, we combined the three values and compared it with the market value of NTT Group (excluding NTT DoCoMo and NTT Data) which we got in the first approach.

We assumed the following sales growth and expense growth for NTT East and NTT West. The reasons behind are the higher penetration rate of Internet services and that NTT East and NTT West can reduce operating costs by achieving economies of scale and reducing depreciation by cutting investments in fixed lines.

	2001	2002	2003	2004
Sales growth	-4%	-3%	-1%	3%
Expense growth	-10%	-9%	-7%	-6%

We used the same risk free rate of 1.9% and market risk premium of 5.9% as in the 1st approach. We calculated the market beta to be 1.0 based on historical data which is lower than NTT DoCoMo and NTT Data because fixed line business is more stable. Corporate tax is assumed at 42% and long-term growth rate used in forecasting is assumed at GDP growth rate of 2.1%. We also assumed that the value of non-core businesses in NTT Group (such as NTT Urban Development) are not significant and therefore can be ignored in our analysis.

We estimated un-levered free cash flow and discounted using WACC of each company to get total net present value (NPV) for debtors and equity holders. Then, we subtracted the value of debt capital to get the present value of forecasted cash flow for equity

holders. The formula we used to estimate the present value of continuing value is: $PVt/(r-g)^*$

PV factor, with g: long term growth rate and r = WACC.

PV (million)	
NTT West	2,783,683.12
NTT East	8,003,208.18
NTT Communications	1,365,415.96
Total of three companies	12,152,307.26
Compared with	
Market value	-30,005,897.50
Value Creation	42,158,204.76
Conclusion	Undervalue

Based on our valuation model, the market undervalued the total 3 companies a lot.

From the above table, we can see the value of the rest three major companies is 12,152,307.26 million yen which is positive. Compared with the market value which is a huge negative number for the rest of the NTT, we can conclude that the market misfunctionally undervalued the rest of the NTT (NTT Group excluding NTT DoCoMo and NTT Data). Hence, if NTT Group breaks up its group companies, the hypothetical value creation would be 42,158,240 million yen (valuation result of 12,152,307 less market value of -30,005,897 million yen).

Sensitivity Analysis

We assumed another 2 scenarios, NTT's performance under good economy and bad economy in order to make sure our valuation results are reasonable under different assumptions. Here we assumed that NTT East and West might have the same growth rate

while NTT Communication might have different growth rate since it has different operations.

In the following scenarios, we kept other parameters constant such as depreciation, capital expenditures, and change sales growth rates according to different economic situations assumptions.

Good economy: 2% more growth for each company

Sales Growth rate	2000	2001	2002	2003	PV
NTT West	-2%	-1%	1%	5%	4,717,526.76
NTT East	-2%	-1%	1%	5%	10,050,608.73
NTT Communications	8%	8%	8%	8%	2,583,922.81
Total of three companies					17,352,058.29

Bad economy: 2% less growth for each company

Sales Growth rate	2000	2001	2002	2003	PV
NTT West	-8%	-7%	-5%	-1%	(759,750.15)
NTT East	-8%	-7%	-5%	-1%	4,251,701.55
NTT Communications	4%	4%	4%	4%	211,573.58
Total of three companies					3,703,524.98

Based on the above scenario analysis, even though we changed sales growth rate for each of the three companies, the total value is still positive. Hence, we concluded that the market has undervalued NTT Group (excluding NTT DoCoMo and NTT Data).

Conclusion

Based on our two approaches to value NTT Group, we see that the market has undervalued NTT. Supposing NTT breaks up its group companies, the market value of the individual companies could be priced correctly by the market and hence the sum of all the

individual companies could increase. Hence, this is one suggestion in which NTT can consider in order to increase its market value.

A second suggestion is related to internal capital markets. Supposing capital is not reallocated from profitable subsidiaries to less profitable subsidiaries, capital could be kept within the profitable subsidiaries. The capital could be used to fuel growth in the more profitable companies such as DoCoMo. Hence, higher growth in the more profitable subsidiaries could potentially lead to higher profits and higher market value.

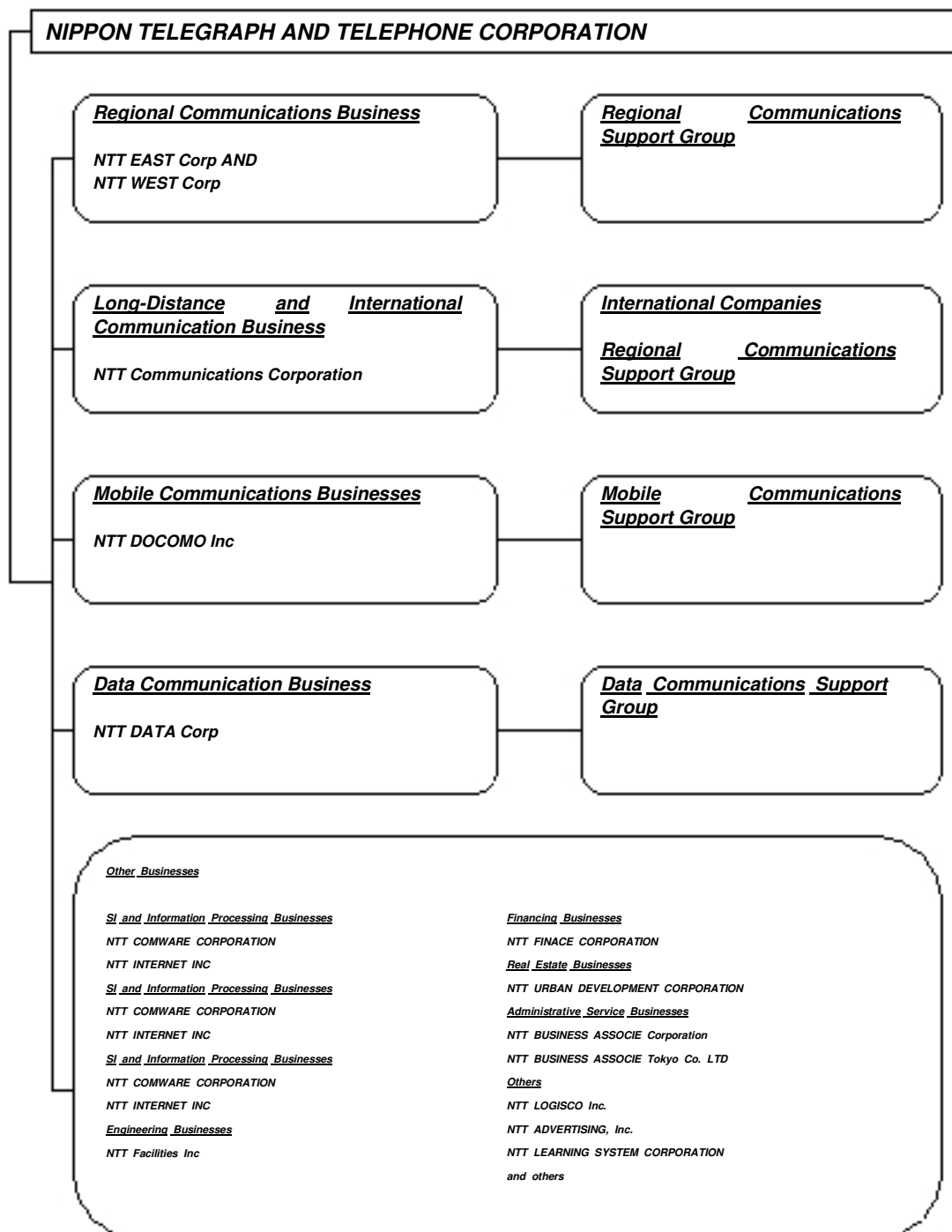
In conclusion, we suggest that NTT could consider breaking up its group companies as a way of increasing market value.

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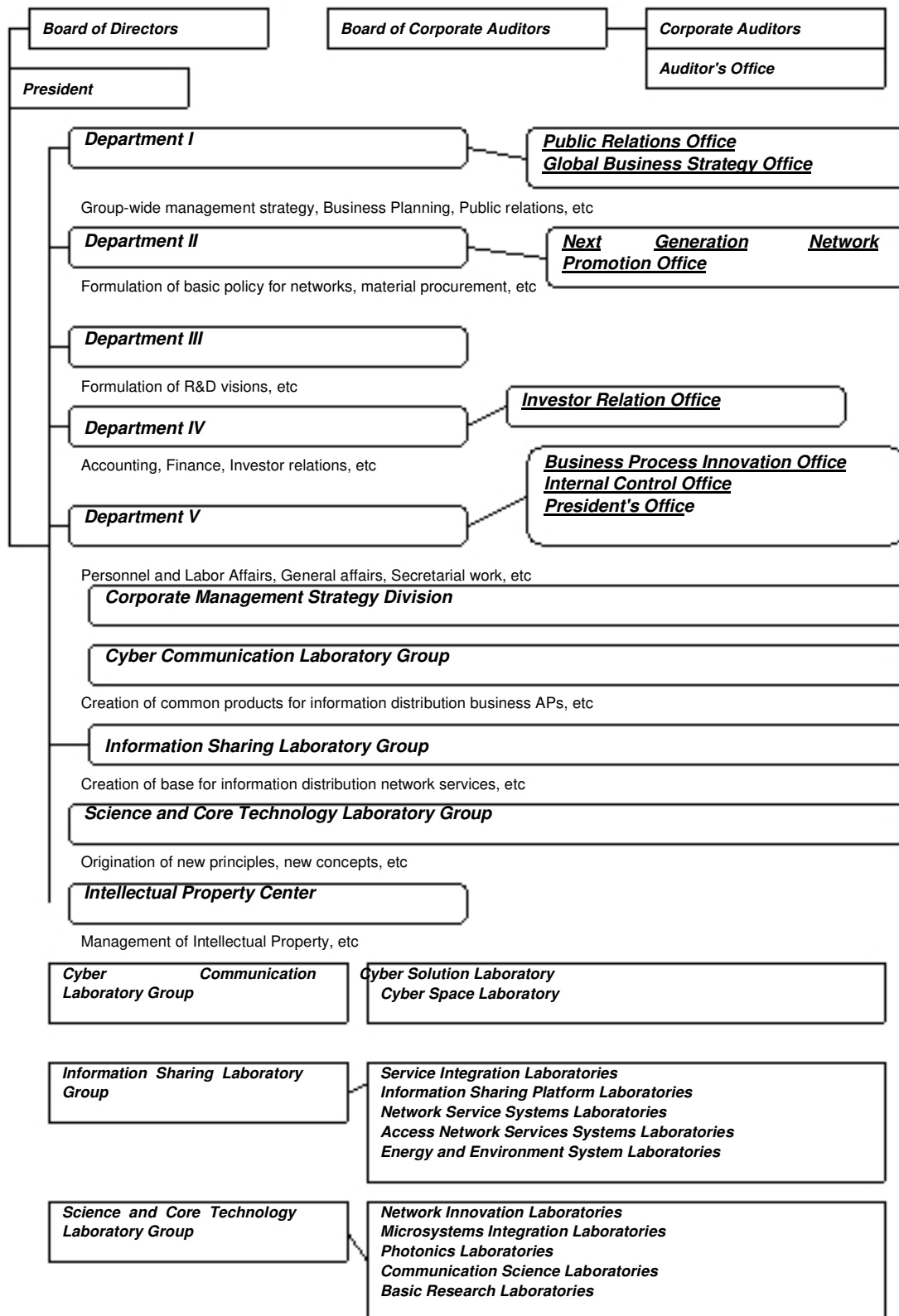
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APPENDIX

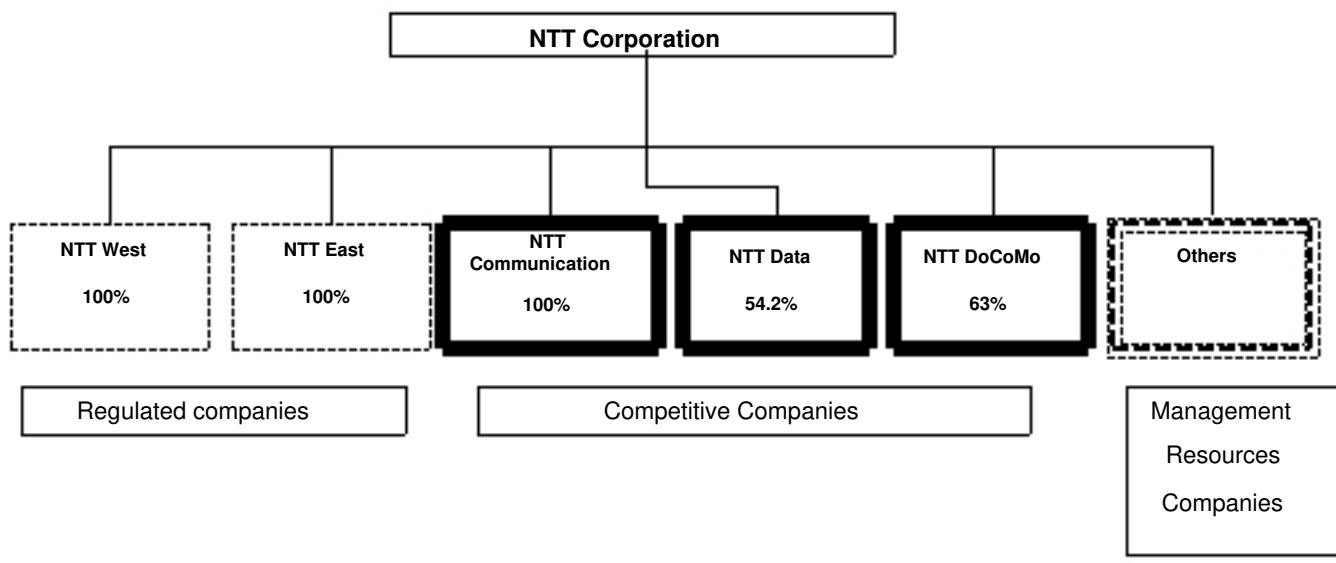
Appendix 1: NTT Group Structure



Appendix 2: NTT Management Structure



Appendix 3: NTT Group Composition



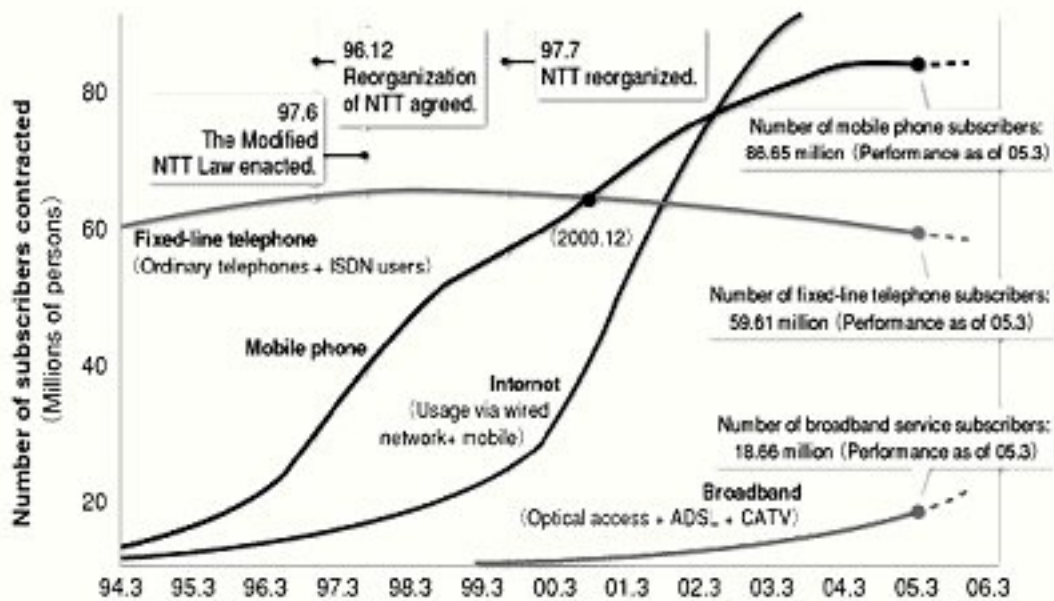
Source: www.ntt.co.jp

Company	Voting Rights ratio	Total Asset	Operating Revenues	Number of Employees	Paid in Capital
NTT Corporation (Holding company)		•8.4 trillion	•323.2 billion	2,792	•937.95 billion
NTT East	100%	•4.0 trillion	•2.1 trillion	14,200	•335 billion
NTT West	100%	¥ 4.0 trillion	•2.0 trillion	12,850	•312 billion
NTT Communications	100%	•1.5 trillion	1.1 trillion	7,700	211.65 billion
NTT Data	54.2%	•1.0 trillion	•854.15 billion	18,720	•142.52 billion
NTT DoCoMo	63.0%	•6.1 trillion	•4.8 trillion	21,527	•949.67 billion
NTT Group		•19.0 trillion	•10.8 trillion	201,000	

Source: Produced by NTT Platform group based on NTT's website

Appendix 4: Industry Trends 1

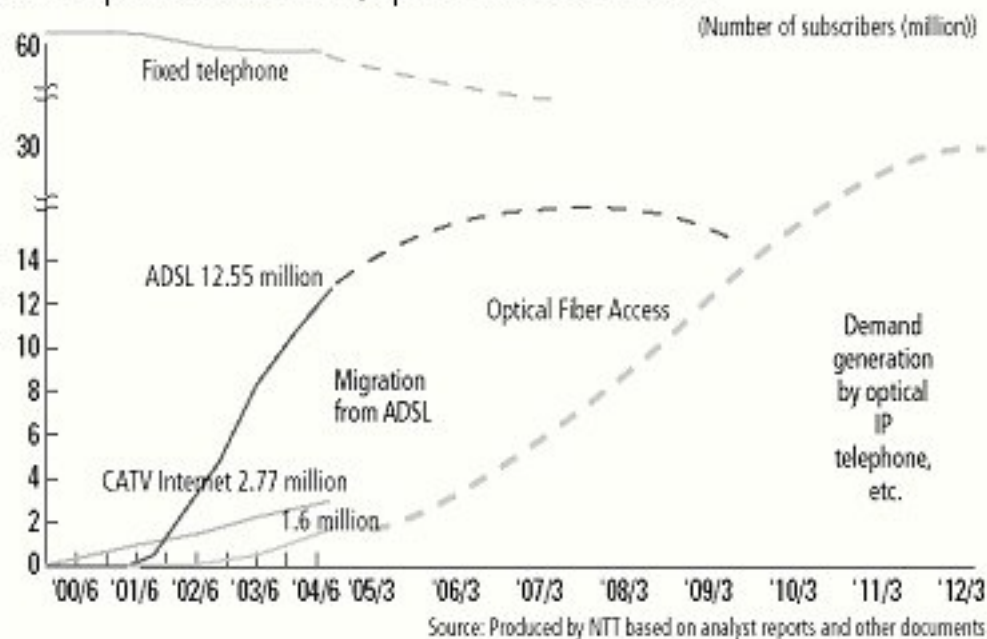
■ Changes in Market Structure in the Communications Field



- *1 The number of fixed-line telephones (Ordinary telephones + ISDN users) is predicted by NTT.
- *2 The number of mobile phone subscribers is predicted by the Mobile Computing Promotion Consortium (MCPC).
- *3 The number of Internet users is given by InfoCom Research, Inc.
(The duplicate use of a wired network and a mobile is counted as one.)
- *4 The predicted number of broadband subscribers is a target value indicated in the "e-Japan Strategy."

Appendix 5: Industry Trends 2

Subscriptions for fixed-line, optical and ADSL services



Source: www.ntt.co.jp

Appendix 6: Timeline of NTT

1952	Nippon Telegraph and Telephone Public Corporation established
1979	INS Concept announced
1985	Nippon Telegraph and Telephone Corporation(NTT) incorporated as a private company
1987	NTT listed on First Section of the Tokyo Stock Exchange
1988	NTT DATA CORPORATION started operations
1990	VI&P Concept announced
1992	NTT Mobile Communications Network, Inc.(presently NTT DoCoMo)started operations
1994	Basic Concept for the Coming Multimedia Age announced
1995	NTT DATA listed on Second Section of the Tokyo Stock Exchange
1996	21st Century R&D Vision announced
"	NTT DATA listed on First Section of the Tokyo Stock Exchange
1997	Digitization of communications network in Japan completed
1998	Global Information Sharing Concept announced
"	NTT DoCoMo listed on First Section of the Tokyo Stock Exchange
1999	NTT's operations were reorganized into a holding company structure, and it transferred its businesses to three new wholly owned subsidiaries, NTT East, NTT West, and NTT Communications
2002	Prefecture-based subsidiaries of NTT East and NTT West started operations
"	Vision for a New Optical Generation announced
2004	NTT URBAN DEVELOPMENT CORPORATION listed on First Section of the Tokyo Stock Exchange
"	NTT Group's Medium-Term Management Strategy announced New concepts and visions / Management Strategy

Source: www.ntt.co.jp

Appendix 7: Personnel Reduction

Personnel Reduction in NTT Corporation	
By Fiscal Year 2000	
Ways of Reduction	Notes
Reallocated in Group	around 3000 personnel reallocated
Hiring Freeze	2 year Hiring Freeze from Fiscal Year 2001-2002
Voluntary retirement	in Fiscal Year 2001-2002, 8,000 voluntary retirement planned
Streamlining of operations	On Operation, consolidation of Customer services offices by one third, etc.

Source: Produced by NTT Platform group based on NTT's website

Appendix 8: Offering History

Offering history of government owned shares

		offered number of share	proceeds (million yen)		government's stake	
1986	1st	1,950,000	23,591	13,650,000	87.50%	
1987	2nd	1,950,000	49,098	11,700,000	75.00%	
1988	3rd	1,500,000	28,138	10,200,000	65.40%	
1998	4th	1,000,000	8,359	9,404,000	59.10%	
1999	5th	1,000,000	16,308	8,404,000	53.10%	
2000	6th	1,000,000	9,366	7,404,000	45.90%	
Total		8,400,000	134,860			

Stock repurchase from the government

2002		91,800	396	7,404,000	45.90%
2003		85,157	459	7,312,200	45.90%
2004		800,000	3,664	7,227,043	40.80%
2005		1,123,043	5,424	5,304,000	33.70%
Total		2,100,000	9,943		

Source: Produced by NTT Platform group based on NTT group history (1995-2005)

Offering by the government and NTT's stock price



Source: Source: Produced by NTT Platform group based on Bloomberg

Appendix 9: Balance Sheet

Five Year Overview of Operating Revenue (Devided into segment)					
	Millions of Yen				
	1997	1998	1999	2000	2001
Telephone	•6,038,146	•6,306,034	•6,300,460	•6,394,562	¥6,171,979
Telegraph	•98,683	•92,211	•85,521	•82,631	•78,903
Leased circuit	•428,715	•488,160	•507,163	•499,891	•494,264
Data communication facility	•337,934	•372,765	•383,455	•397,107	•388,083
ISDN services	•190,403	•367,826	•555,976	•818,833	¥1,081,623
Sale of telecommunication equipme	•889,834	•969,586	•1,008,589	•1,138,369	¥1,477,143
Miscellaneous	•838,067	•853,431	•888,509	•1,051,946	¥1,636,103
Total	\$8,821,782	\$9,450,013	\$9,729,673	\$10,383,339	\$11,328,098

Appendix 10: Market Presence of Domestic Carriers (2001)

List of Communication Carriers and its subsidiaries in Japan as 2001

Carriers		Subsidiaries
NTT Group		Communications, Data, West, East, DoCoMo (mobile)
KDDI Group		AU (mobile), Tu-Ka, DDI Pocket
JT Group		J-Phone (Vodafone on the way to acquiring full control)
TTNet		Astel (mobile)
New Players	<p>VoIP: Fusion, C&WIDC</p> <p>FTTH: Usen Broad Networks, Tokyo Electric Power</p> <p>ADSL: Yahoo! BB, E-Access, etc</p> <p>Wireless: SpeedNet, Sony</p> <p>Cable Telephony/Internet: Jupiter Communications, iTSCOM, etc</p> <p>Overseas: WorldCom, KVH, etc</p>	

Source: Produced by NTT Platform group based on NTT's website

Appendix 11: Organization of Major Overseas Carriers (2001)

Location	Carriers	Subsidiaries
Japan	NTT Group	Data, Communications, DoCoMo, East, West.
North America	Verizon Communications	Online, Long Distance, Wireless, New York, other local companies
	AT&T	Consumer, Business, Broadband, Wireless
EU	BT	BT, BT Cellnet, OpenWorld, Ignite
	Deutsche Telecom	T-Online, DT, T-Mobile
	France Telecom	FT, Orange, Wanadoo

Source: Produced by NTT Platform group based on NTT's website

Appendix 12: Internet Usage Rates in U.S. & Japan (2001)

Reduce in Internet Usage Rate (1999-2001)

Type of Connections	1999		2001	
	Japan	U.S.	Japan	U.S.
ADSL Fixed	6,980	4,781	4,100	5,899
Dial-Up	12,900	4,193	3,680	4,193
<i>Percentage Rate (reduce)increase</i>	-	-		

Source: Produced by NTT Platform group based on NTT's website

Appendix 13: Current Status of Japanese Telecom Market (2001)

Number of Telecom Carriers (New Common Carriers)

Period	April 1985	April 1989	April 1993	April 1997	April 2001	March 2006
Number of Carriers	87	738	1,259	4,726	9,348	13,729

Source: Produced by NTT Platform group based on NTT's website