

Privatization of Transit in Yokohama: Social and Financial Impacts

by

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Submitted to the Department of Urban Studies and Planning in partial fulfillment of the requirements for the degree of

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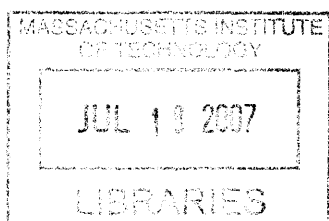
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Submitted to the Department of Urban Studies and Planning on May 25, 2006 in partial fulfillment of the requirements for the degree of Master of City Planning

Abstract

This research examines both social and financial impacts of the privatization of municipally-owned transit systems from the perspective of a privatizing city and its citizens by studying the case of Yokohama, Japan's second largest city whose transit systems are now subject to privatization arguments. First, privatization models are defined based on two dimensions – degree of privatization and deregulation, which are frequently commingled and misused. Then, this research examines the social impact on fare levels, service quality, safety, service provision, and labor condition is analyzed based on prior privatization cases such as Singapore's MRT system, the UK municipal bus systems, and Japan National Rails. Third, this research suggests a new framework and methodology based on the perpetuity valuation for financial impact analysis and quantifies the financial value of each option from the perspective of the City of Yokohama and its citizens.

Based on the above analysis, this research concludes that publicly-controlled full privatization in which government retains regulatory power over a privatized entity after full privatization is the most effective managerial model among the examined options at least for the City of Yokohama because this option maximizes the net financial value (Citizens' Equity Value) for the city, while at the same time minimizing the social risks potentially caused by privatization. More generally, this research recommends that government should keep its control over a privatized public transit service even after full privatization and should not rely much on market mechanism in order to alleviate public concerns and protect public interest.

Because transit privatization is a hot public policy issue discussed widely among major municipalities in Japan and in developed nations, this research is expected to provide evidence and policy guidelines not only for Yokohama but also for other municipalities in developed nations that own and operate transit systems.

Thesis Supervisor: Nigel H.M. Wilson

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Finally, I would like to show my appreciation to my family, my parents-in-law and my mom who supported my studies at MIT. Among all who supported my research at MIT, I wish to thank my wife, Masumi, most. When I determined to quit a prestigious position at McKinsey for my new life, she supported my decision without any hesitation. She encouraged and helped me over the years at MIT. Without her support, my studies at MIT could not have been actualized. Thank you, Masumi with my sincere appreciation and love.

Biography

A native of Kyoto, Japan, Tsukihito Nakajima graduated from Keio University with a Bachelor's degree in policy management in 1998. Upon graduation, Tsukihito joined McKinsey & Company, Inc. For six years at McKinsey, he served 19 client companies from a venture company to large conglomerates in a variety of industries for a variety of managerial issues. His final tenure at McKinsey was Engagement Manager. Tsukihito also has professional experience as a summer associate at the Investment Bank Division, JP Morgan Securities, Japan, in which he first showed his interest in privatization finance.

Because of his primary interest in public policy, Tsukihito also worked for some of Japan's local governments after leaving McKinsey for one year. For example, Tsukihito developed revitalization and marketing plans for the Yokohama Municipal Zoos. Through this project, he became interested in municipal reform in Yokohama led by Mayor Nakada.

At MIT where he was known, for convenience, as "Jack", named after his favorite Tom Clancy's novel and movie character –Jack Ryan, Tsukihito studied economic development and public policy issues at the Department of Urban Studies and Planning. He also reinforced his finance knowledge and skills by taking corporate finance and financial accounting courses at the Sloan School of Management.

Tsukihito lives with his wife, Masumi, who is a flight attendant at Japan Airlines—"Flying" Public Transit Operator and patiently supports Tsukihito.

Table of Contents

Chapter 1: Introduction.....	13
1.1 Background.....	13
1.1.1 Privatization Trend of Public Transportation.....	13
1.1.2 What is Privatization?	15
1.1.3 General arguments for and against privatization.....	16
1.2 Research Objective.....	18
1.3 Research Approach	19
1.4 Thesis Organization	20
 Chapter 2: Privatization Models	 21
2.1. Spectrum of Privatization	21
2.1.1. Range of Privatization Options.....	21
2.1.2 Key elements of Privatization.....	24
2.2 Governmental Control.....	26
2.2.1 Governmental Control for a Rail Network.....	27
2.2.2 Governmental Control for a Bus System.....	29
2.2.3 Spectrum of Government Control.....	30
2.3 Privatization Models for public transportation.....	31
2.4 Concluding remarks	35
 Chapter 3: Privatization Argument in Yokohama	 36
3.1 Nakada's Reform	36
3.2 Municipal Public Transportation in Japan.....	38
3.3 Municipal Transportation Systems in Yokohama.....	41
3.3.1 Yokohama Municipal Subway Network	41
3.3.2 Yokohama Municipal Bus Service	45
3.4 Privatization Arguments in Yokohama.....	48
3.4.1 Birth of the Ad-hoc Committee	48

3.4.2 Ad-hoc Committee's Findings	51
3.4.3 Critique of the Ad-hoc Committee Reports.....	52
3.4.4 Counter Proposal from Yokohama Transportation Bureau.....	53
3.4.5 Critique of the counter-proposal from Yokohama Transportation Bureau.....	55
3.5 Concluding remarks	56
 Chapter 4: Social Impact of Privatization.....	 57
4.1 Public Concerns about the Privatization of Public Transportation	57
4.2 Fare Increases	59
4.2.1 Empirical Analysis	59
4.2.2 Discussion and Implications for Yokohama	63
4.3 Service Quality	64
4.3.1 Empirical Analysis	65
4.3.2 Discussion and Implications for Yokohama	71
4.4 Safety	73
4.4.1 Empirical Analysis	73
4.4.2 Discussion and Implications for Yokohama	76
4.5 Abandonment and Dilution of Transit Service Provision.....	77
4.5.1 Empirical Analysis	78
4.5.2 Discussion and Implications for Yokohama	80
4.6 Labor impact of Privatization.....	81
4.6.1 Empirical Analysis	81
4.6.2 Discussion and Implications for Yokohama	84
4.7 Concluding remarks	85
 Chapter 5: Financial Valuation of Privatization	 87
5.1 Financial impact of privatization	87
5.1.1 Prior research and its limitations	87
5.1.2 Approach of this research	89

5.2 Methodology	90
5.2.1 Valuation method- Perpetuity based valuation	90
5.2.2 Steps in Valuation	92
5.3 Key Assumptions for Valuation.....	100
5.3.1 Revenue	102
5.3.2 Cost Items.....	104
5.3.3 Balance Sheet Items.....	109
5.4 Valuation for Yokohama Municipal Subway Network (YMSN)	110
5.4.1 Value of Status-quo (Public Ownership Model)	110
5.4.2 Concession Model	111
5.4.3 Publicly-controlled Full Privatization (PFP)	113
5.4.4 Analysis.....	116
5.5 Valuation for Yokohama Municipal Bus System (YMBS).....	118
5.5.1 Value of Status-quo (Public Ownership Model)	118
5.5.2 Value of Concession Model.....	120
5.5.3 Value of Publicly-controlled Full Privatization.....	122
5.5.4 Analysis.....	123
5.6 Concluding remarks- Integration of social and financial analyses.....	126
 Chapter 6: Summary and Conclusion	 130
6.1 Summary.....	130
6.2 Recommendations for the City of Yokohama	132
6.2.1 Combination or Separation	133
6.2.2 Privatization Scheme	134
6.2.3 Governmental Control.....	137
6.3 General Implications	138
6.4 Further research	140
 References.....	 144

APPENDIX A: VALUATION MODEL FOR YMSN	149
APPENDIX B: VALUATION MODEL FOR YMBS	156
APPENDIX C: EARNING BEFORE INTEREST AND TAX (EBIT) OF COMPARABLE COMPANIES	163

List of Figures

Figure 2-1: Technical Options for Privatization.....	25
Figure 2-2: Spectrum of Ownership Models.....	26
Figure 2-3: Spectrum of Governmental Control.....	31
Figure 2-4: Privatization Models.....	32
Figure 3-1: Yokohama Municipal Tax Revenue.....	37
Figure 3-2: Yokohama Municipal Bonds Issued.....	38
Figure 3-3: Breakdown of Transportation Mode in Japan.....	39
Figure 3-4: Financial Performance of Major Subway Networks in the World.....	39
Figure 3-5: Financial Performance of Major Bus Networks in the World.....	40
Figure 3-6: Annual Ridership of Major Subway Networks in the World.....	42
Figure 3-7: Passenger per day – Forecast vs. Actual.....	43
Figure 3-8: Length of Municipal Subway Networks in Japan.....	43
Figure 3-9: Operating Profit vs. Net Income – YMSN.....	44
Figure 3-10: Annual Ridership of Bus Networks in the Word.....	45
Figure 3-11: Growth of Yokohama Bus Network.....	46
Figure 3-12: Operating Profit vs. Net Income – YMBS.....	47
Figure 3-13: Leakage of Ridership in Private Bus Operators.....	48
Figure 3-14: Productivity of Rail Operators.....	50
Figure 3-15: Cost Productivity – Yokohama Municipal Bus vs. Private Bus Operators.....	50
Figure 3-16: Yokohama Residual Municipal Debt.....	51
Figure 4-1: Real Fare Level of SMRT.....	60
Figure 4-2: Real Fare Level of London Bus.....	62
Figure 4-3: Real Fare Level of London Underground.....	64
Figure 4-4: SMRT Service Quality.....	66
Figure 4-5: Passenger Growth vs. Fare Change of the MRT System.....	67
Figure 4-6: Change in Train Density of JR.....	68
Figure 4-7: Passenger Growth Vs. Fare Change of London Bus.....	70

Figure 4-8: Fleet Mix of UK Local Bus Services.....	71
Figure 4-9: SMRT Customer Injury Rate.....	74
Figure 4-10: Accident Rate of JRs.....	75
Figure 4-11: Historical Trend of Fatal Accidents in the UK National Rail.....	76
Figure 4-12: Number of Employees of the MRT system.....	82
Figure 4-13: UK Bus Sector Employment.....	84
Figure 5-1: Perpetuity Value of the Baseline FCF – Example of YMSN.....	100
Figure 5-2: JRs' Passenger Demand Growth.....	103
Figure 5-3: Labor Productivity Gap Assumption for YMSN.....	106
Figure 5-4: Annual Salary -Private Operators vs. YTB.....	107
Figure 5-5: Value of the Public Ownership Model – YMSN.....	110
Figure 5-6: Value of the Concession Model – YMSN.....	112
Figure 5-7: Value of the PFP Model – YMSN.....	114
Figure 5-8: Business Value of the Three Models – YMSN.....	116
Figure 5-9: Citizens' Equity Value of the Three Models – YMSN.....	117
Figure 5-10: Value Range between “Optimistic” and “Pessimistic” Scenario – YMSN	118
Figure 5-11: Value of the Public Ownership Model – YMBS.....	119
Figure 5-12: Value of the Concession Model – YMBS.....	121
Figure 5-13: Value of the PFP Model – YMBS.....	123
Figure 5-14: Business Value of the Three Models – YMBS.....	124
Figure 5-15: Value Range between “Optimistic” and “Pessimistic” Scenario – YMBS	125
Figure 5-16: Citizens' Equity Value of the Three Models – YMBS.....	126

List of Tables

Table 4-1: Fare Increases for JNR and JRs.....	61
Table 4-2: Service Quality of London Bus.....	69
Table 5-1: Historical FCF and Baseline FCF for YMSN.....	94
Table 5-2: Historical FCF and Baseline FCF for YMBS.....	95
Table 5-3: WACC Estimation for YMSN.....	97
Table 5-4: WACC Estimation for YMBS.....	97
Table 5-5: Summary of Assumptions – YMSN.....	102
Table 5-6: Summary of Assumptions – YMBS.....	102
Table 5-7: Change in “Other” Operating Cost – JR.....	108
Table 5-8: Value by Scenario – Public Ownership (YMSN).....	112
Table 5-9: Value by Scenario – Concession (YMSN).....	113
Table 5-10: Value by Scenario- PFP (YMSN).....	115
Table 5-11: Value by Scenario – Public Ownership (YMBS).....	119
Table 5-12: Value by Scenario – Concession (YMBS).....	122
Table 5-13: Value by Scenario- PFP (YMBS).....	123

Chapter 1: Introduction

This thesis evaluates the social and financial impact of the privatization of municipally-owned transit in Japan through analyzing the case of Yokohama. Based on the evaluation and analysis, this research finally develops a recommendation to the City of Yokohama and designs an effective managerial model for the public transit networks which can be applied to other municipalities in Japan. Because major cities in Japan which own and operate public transit networks are in a similar situation and face similar policy issues, this thesis is expected to provide useful guidance for their privatization decisions. Furthermore, this research should be useful for policy makers in the field of public transportation policy in other nations because the privatization of public transportation is a hot policy topic throughout the world.

1.1 Background

1.1.1 Privatization Trend of Public Transportation

Privatization has been a buzz word since the aggressive implementation of privatization by Margaret Thatcher in 1980s in the UK. Political leaders in many developed nations were influenced by her privatization program and imported and applied the scheme in their countries. Ronald Reagan and his administration aggressively promoted privatization in the US. Mr. Nakasone, the Prime Minister of Japan at that time and friend of Thatcher and Regan, was one of the strongest proponents of privatization. In fact, he privatized three giant public enterprises: Nihon Tobacco, Nippon Telegraph & Telecommunication, and Japan National Rail.

Public transportation has been one of many public monopoly industries targeted for privatization in many nations. In the UK, since the Transportation Act of 1981, local bus networks, British National Rail and finally London Bus have been privatized. In 1987, the Japanese central government privatized Japan National Rail (JNR), one of the largest

railway networks in the world, and divided it into seven regional companies. The Singapore Government corporatized and privatized its globally renowned rapid transit system, Mass Rapid Transit (MRT) in 2000 by listing its stock on the national stock market. Furthermore, in Hong Kong even after being returned to communist China, the subway system was reborn as Mass Transit Rail Corporation (MTRC) through full privatization. These are just a few examples of the privatization of public transportation networks.

Privatization is not a policy topic just at the national level. In some of the nine Government Ordinance Cities in Japan¹, the privatization of municipally-owned public transit systems has recently become a hot policy issue for the following two reasons. First, the financial deficit of, and capital requirement for, municipally-owned public transportation has worsened municipal finance. Second, because of huge municipal debt and its interest obligation, the municipal governments in those cities have begun to seek privatization opportunities in order to obtain extraordinary capital and to consider the public transportation network as the largest opportunity in terms of impact. Additionally, the success of the JNR privatization has encouraged municipal leaders to buy in to the privatization idea. In fact, the Tokyo Metropolitan Government and the central government corporatized Teito Rapid Transit Authority (and its network) in 2003 and plan to privatize it by selling stock to private investors eventually, as in the case of JNR. The Mayor of Osaka has announced that the city will privatize its subway network, Japan's second largest, as well as the bus system by 2010.

Similar to the other municipalities, the City of Yokohama has suffered from excessive municipal debt and huge financial losses of the public transit system for a long time. Given this situation, the city is now struggling with the decision of whether it should privatize the transit network in order to leave its problematic operations in private hands and to obtain cash which can be used to reduce the city's debt obligations.

¹ The Prime Minister and his cabinet designate the cities that are treated as legally special administrative districts and awarded autonomy equivalent to prefectures based on population fiscal and economic conditions, and other factors. At the end of 2006, there are nine Government Ordinance Cities including Yokohama.

1.1.2 What is Privatization?

As described above, privatization has been a hot policy issue throughout the world. But, what is privatization? As Donahue pointed out, privatization is “[a] lamentably imprecise word” (1989) because this buzz word has been used in different meanings in different political and economic contexts, country to country. In the US, privatization usually means contracting-out by which the public sector contracts with a private operator and lets it run the operation; however, the asset ownership still remains in public hands. In contrast, in the UK and Japan, privatization usually means that the public sector sells the combination of assets and the right of operation to private investors, this will be referenced as full privatization.

In addition, privatization is often confused with deregulation or liberalization. Privatization and liberalization/deregulation are distinct concepts (Vickers & Yarrow, 1997). Liberalization is the process in which the public sector removes regulations and makes the market once monopolized by the public sector open to private companies. However, in the privatization process, regulations are not necessarily removed. The public sector may retain its regulatory power and control even after full privatization. For example, after the privatization of Japan National Rail, the central government has continued to impose stringent regulatory schemes on the post-privatization entities so that, for example, they cannot change the fare level without approval from the government. Another example is the London Bus. Transportation for London (TfL) retains its control and regulatory power as planner, regulator, and tenderer after full privatization so that competition among, and performance of, private operators are effectively managed. Many arguments opposing privatization are actually arguments opposing the abandonment of public intervention, i.e., deregulation or liberalization, not privatization.

Privatization is the process through which the public sector transfers some of its operations and/or assets to the private sector. However, whether a government privatizes only operation rights or also ownership of assets can have totally different outcomes and

implications; thus, the privatization model in a given context should be specified in order to avoid confusion and misunderstanding. As will be discussed in detail in Chapter 2, the models of privatization can be defined along two dimensions: the degree of privatization and the degree of regulation. The degree of privatization is how much ownership the public sector relinquishes, while the degree of regulation literally means how much regulatory power the public sector retains after privatization.

1.1.3 General arguments for and against privatization

The proponents of privatization have emphasized its impact on fiscal and operating performance. They argue that the private sector can frequently operate a given service or business more efficiently and cost effectively than the public sector. They often attribute the inefficiency in the public sector to its bureaucratic nature; the lack of managerial discipline, skill, the sense of urgency, and competitive pressure. In fact, several studies demonstrated how financial performance and operating performance was significantly improved in many cases of privatized public enterprises based on either full privatization or partial privatization. For instance, Megginson, et al. statistically show that profitability, real sales (excluding subsidies) and operating efficiency have improved significantly after privatization, using 118 cases around the world between 1961 and 1995 (2001).

In contrast, the opponents of privatization argue that privatized companies tend to focus too much on profit and shareholders' interest so that public interest is frequently ignored. In the context of the privatization of public transportation, the opponents argue that a privatized company is likely to increase fares, abandon unprofitable routes, and decrease the quality of service in order to maximize profit. In addition, they argue that a privatized company is also motivated to lay-off existing workers which are usually the largest component of operating cost. In sum, the opponents of privatization emphasize social equity issues and argue that generally privatization is harmful to the social welfare.

However, the arguments from both proponents and opponents are not comprehensive and contain critical flaws and loose generalizations. Sclar described the "policy debate

[on privatization] largely has been little more than dueling anecdotes. Those favoring privatization tell their favorite stories, and those opposed peddle theirs” (2001). One of the most critical flaws in the pro-privatization argument based on financial and operating improvement is that its analytical unit is a privatized organization or business. Almost all analysis on financial and performance improvement focuses only on the improvement in a given privatized entity or even in individual financial items such as operating cost or operating profit; they fail to examine the comprehensive financial impact from the perspectives of governments and citizens who ultimately own privatized public assets. While whether the privatized company improves its cost performance or profit is important, measuring the total financial impact on a governmental fiscal condition is much more important from the perspective of the public. Another flaw is that these proponents often fail to analyze the non-financial and social influence of privatization. In this sense, they do not effectively respond to the opponents of privatization.

Likewise, the argument of opponents contains critical imperfections. The opponents fail to support their argument with solid evidence including comprehensive financial impact analysis from the public perspective. Although they sometime refute proponents by presenting analysis that there is no significant difference in financial performance between private and public operation, they look only at cost performance and fail to look at the other important financial aspects such as the impact on tax and municipal debt. Opponents also frequently fail to present evidence that privatization harms the social welfare and interest. More importantly, the opponents frequently replace the argument of privatization with that of regulation or other forms of governmental intervention. Privatization itself does not necessarily mean that a privatized entity is released from the control or intervention of a public authority. As will be examined in detail in Chapter 2 and 4, even a privatized railway company cannot, for instance, increase fare level unless the fare regulation is removed. In sum, the opponents of privatization also do not effectively respond to their counterparts.

1.2 Research Objective

As described above, the chaotic debate between the proponents and opponents of privatization has been going on for some time. While many cases of privatization of public transportation are observable nowadays, there is little research that addresses the effective managerial model for municipal public transportation. Also, no research, to the knowledge of the author, provides an analysis examining how privatization affects the public interest and social welfare related to public transportation and how much financial value for a city or its citizens privatization can create, comprehensively. As a result, policy makers or municipal leaders who are struggling with whether they should privatize their public transportation systems do not have an effective framework or guidelines they can follow in their privatization decision.

Given this situation, the primary goal of this thesis is therefore to suggest the effective managerial model for municipal public transit system, which minimizes the social risk and maximizes the financial impact. More specifically, this thesis first defines the key managerial models for municipal public transportations, considering the degree of privatization and governmental intervention. Then, the thesis will examine how social benefits relating to public transit would be affected by each managerial model. Incorporating these analyses, this thesis will then examine how much financial value for a city and its citizens can be created by each model by using the financial data for Yokohama's public transit networks. Through these analyses, the effective managerial model will be determined, and recommendations specifically for the City of Yokohama but also for other Japanese municipalities will be crafted.

Yokohama's public subway and bus systems are selected as the case to be tested because of the data availability particularly for financial valuation. In addition, Yokohama, the second largest city in Japan and known as a progressive city whose policy reforms garner attention from other municipalities, is now facing a privatization decision for its public transit networks as will described in detail in Chapter 3.

1.3 Research Approach

To achieve the objective addressed above, this research adopts the following methodologies and approaches.

- Quantitative and Qualitative analysis of social influence and governmental interventions: this thesis will analyze the social influence of public transit privatization and effective governmental interventions which minimize the social risk, based on actual cases of privatization, specifically for the rail rapid transit (subway), the cases of Japan National Rails and SMRT (Singapore Mass Rapid Transit) will be examined. The case of Japan National Rail is selected to examine the social influence of privatization and the roles of government intervention in post-privatization within the same country as the Yokohama case. SMRT is chosen primarily because it is one of the few cases of subway privatization in the world and because the surrounding social, economic, and political situations are somewhat similar to Yokohama and Japan. To examine the social influence of bus privatization, the UK cases (London and other local bus services) will be examined. Those cases are chosen because the comparison between London and ex-London local bus services can illuminate the differences and similarities in the social influence of privatization with different levels of post-privatization governmental intervention. In addition, among the developed nations, the social, political, and economic systems in the UK are somewhat similar to those in Japan so that those cases provide relevant and practical implications to Yokohama and other Japanese municipalities.
- Financial Valuation from the citizens' perspective: Based on the discounted cash flow (DCF) method and corporate finance theory, the comprehensive financial impact of the privatization of municipal public transportation will be examined by comparing the public ownership (i.e., the continuation of municipal ownership) and the private ownership models. This research not only analyzes the stand-alone business value but also incorporates the financial impact on debt obligation, tax and other financial elements which should be examined to understand the holistic influence on municipal

fiscal condition or the financial burden on tax payers (citizens). To do this, a new analytical framework will be introduced, and financial simulation models will be built and implemented using actual financial data of Yokohama's municipal transportation businesses. The data from other cases will be used to develop the assumptions for this simulation. Because of the uncertainty of the assumption for each financial metric and its sensitivity to the impact, the valuation is conducted with three scenarios –base, optimistic, and pessimistic. The methodology and data used in the valuation will be explained in detail in Chapter 5.

1.4 Thesis Organization

This thesis contains the following 5 chapters. In Chapter 2, the privatization models for municipal public transportation are defined along two dimensions, the degrees of privatization and governmental intervention (regulation). In Chapter 3, the case of Yokohama's municipally-owned public transportation networks, bus and subway, and privatization arguments for them are illustrated. In Chapter 4, the social influence and the risk of the privatization of public transportation will be discussed and examined based on actual cases of privatization. The relationship between the social influence and governmental intervention are also examined. Chapter 5 then introduces the financial valuation model for the privatization of municipal public transportation. Using this model, this chapter analyzes the financial value of each managerial model from the city and citizens' perspective. Chapter 6 then summarizes this research and suggests the effective managerial model for Yokohama and the expected government intervention or regulatory control mechanism for the city.

Chapter 2: Privatization Models

This chapter discusses what privatization means in detail and introduces the privatization models for municipal public transportation. To begin with, the spectrum of ownership models is framed by examining the technical options for privatization. Next, the relationship and differences between privatization and the removal of governmental control are discussed. Finally, based on these discussions, the privatization models of municipal public transportation, which will be examined throughout this thesis, are introduced.

2.1. Spectrum of Privatization

2.1.1. Range of Privatization Options

Although the definition of privatization is the process in which the public sector transfers some of its operations and/or assets to the private sector, there are many technical options to implement the process. The Reason Foundation, one of the most aggressive institutional supporters of privatization, identifies fourteen different technical options including contracting-out, management contract, franchising, asset-sales, and Build-Own-Operate (2006). Even in asset-sales, there are many variations such as direct trade sales, IPO-based privatization, and leveraged buy-out (LBO). Major options frequently applied in privatization practice are the following:

- Contracting-out: Government contracts with a private vendor and allows it to provide public service on its behalf. However, the control over the service standards remains in the public sector, and service users pay a tariff to government (GAO, 1997). The private contractor is compensated based on the contract with government. Typically, a contractor is selected through a competitive bidding process in which the bidder presenting the lowest cost wins the competition. This is the option which is the most commonly applied in privatization practice in the US.
- Franchising: Government awards the exclusive operation rights to a single private firm “within a certain geographical area” (Reason Foundation, 2006) through a

competitive tendering process. Franchising is similar to contracting-out except that a private franchisee keeps the service fee/fares paid by customers as its own revenue while fee or fare level is typically regulated by government (GAO, 1997).

- Market Testing (public-private competition): In this scheme, government treats its in-house public service organization as one of bidders and allows it to participate in a bidding process and compete with private bidders (GAO, 1997). This scheme can be regarded as a process option to implement franchising or contracting-out, although this scheme differs in that it allows public in-house organizations to participate in the bidding for operation rights.
- Trade Sales (Direct Asset Sale): The public sector sells its public assets and operation rights directly to a private investor or company usually via a competitive bidding process.
- Joint Venture: The public sector and the private sector jointly establish a company and share the equity of the company. The public sector may provide public assets as its equity share and let the private sector provide cash for its equity portion so that the public sector can retain the control and participate in the profit stream of the joint venture without cash obligation.
- Initial Public Offering: After corporatizing public service operation and assets, government lists the stocks of the corporation on a public stock market and sells some, or all, of the stock. This method is frequently used in the privatizations in the UK and Japan. Because initial public offering incurs significant cost associated with stock issue and trade (Damodaran, 2003), this scheme is usually applied in relatively large-scale privatizations such as the privatization of a public telecommunication monopoly.
- Leveraged Buy Out (LBO): LBO is commonly used in the private sector in acquiring a company. An acquirer borrows money from banks to buy a target company or business by using the assets or cash/cash equivalents of the target company as collateral. In this way, an acquirer can take over a company or business with

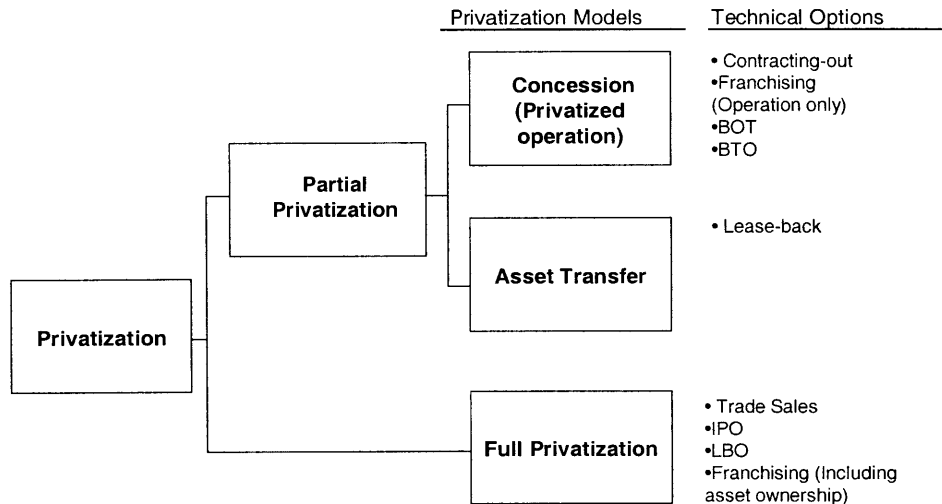
minimum capital from its own account. LBO has variations: Management Buy Out (MBO) and Employee Buy Out (EBO). In MBO, senior managers of a company borrow money to buy their company stock (ownership) from existing shareholders (owners). Likewise, in EBO, a labor union or employee organization borrows money to acquire the company stock from existing shareholders. In the process of the UK bus privatization, MBO or EBO were applied in many cases (Spear, 1999).

- Build-Operate-Transfer (BOT): This scheme is applied particularly to infrastructure-based public service. The private sector finances, constructs, and operates public infrastructure (Reason Foundation, 2006) such as roads, rail lines, and water stations based on a contract with the public sector. After the termination of the contract period, operation rights and asset ownership of the infrastructure are transferred to the public sector.
- Build-Transfer-Operate (BTO): Similar to BOT, this scheme is applied to public infrastructure. However, in this scheme, the infrastructure asset ownership is sold to the public sector immediately after the completion of construction (Reason Foundation, 2006). The private sector continues the operation of the infrastructure by paying leasing fees to the public sector.
- Build-Own-Operate (BOO): Although the Reason Foundation defines this scheme as one of the privatization options (2006), this has nothing to do with privatization in the sense that the private sector finances, constructs, owns, and operate infrastructure (i.e., with no public sector involvement) from the beginning to the end.
- Lease-back: In this scheme, the public sector sells its assets to the private sector and leases the sold assets from the private sector by paying the leasing fee. Note that operation remains in public hands; only asset ownership is transferred to the private sector. In this way, the public sector can obtain one-shot sales proceeds which can be used for other purposes. However, to the author's knowledge, there is no example of this scheme being applied in the privatization of public transportation. Even in other areas of privatization, this scheme has rarely been applied except for the lease-back of governmental office buildings.

2.1.2 Key elements of Privatization

Although many technical options for privatization exist as exemplified above, they can be classified into three groups: privatized operation, asset-transfer privatization, and full privatization (Figure 2-1). Privatized operation is privatization through which the public sector transfers only the operation rights to the private sector through a contract. Contracting-out, BOT, and BTO can be classified in this group because asset ownership in the three options ultimately belongs to the public sector. In other words, only operation rights are transferred to the private sector in these schemes. Whether franchising belongs to this group depends on whether a franchisee needs to provide both service and assets required for a given service by itself. If the public sector provides the required assets and allows a franchisee to use these publicly-provided assets, such franchising belongs to the group of privatized operation (operating franchising). However, if a franchisee owns and provides its assets for a franchised service operation, as in the case of London Bus, this model belongs to full privatization.

In comparison, asset-transfer privatization refers to the case in which the public sector transfers only the ownership of public assets. In this sense, only the lease-back scheme belongs to this category. As mentioned above, this scheme has been rarely applied and not at all to public transportation, to the knowledge of the author.

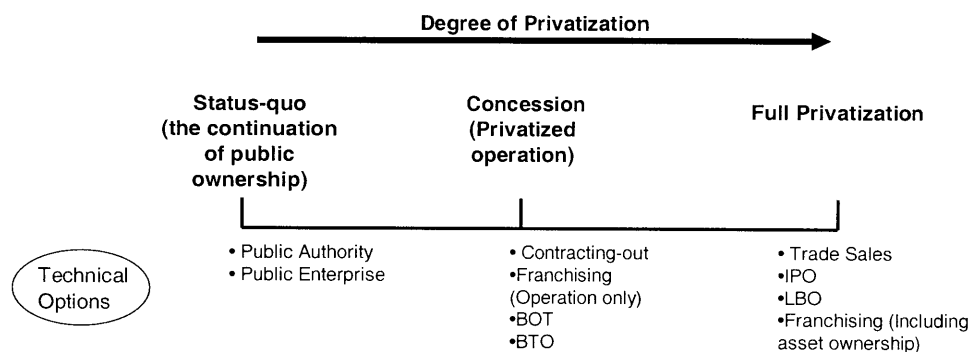
Figure 2-1: TECHNICAL OPTIONS FOR PRIVATIZATION

Full privatization is the combination of the other models because it is the privatization by which the public sector transfers not only the rights of operation but also the assets ownership. Trade sales, IPO, and LBO should be categorized in this group because both operation rights and asset ownership are transferred to a profit-seeking company and its private shareholders. Even when a selling government retains some portion of equity of a privatized organization, as long as operation rights and asset ownership are shifted to a profit-seeking entity, the process of ownership transfer should be regarded as full privatization because such an entity is legally regarded as a private entity. In this sense, a joint venture between the public and private sectors can be seen as one form of full privatization. As described above, franchising in which a franchisee is expected to provide not only service operation but also assets required for the operation should also be counted as full privatization.

Among the above three privatization categories, this thesis focuses on the privatized operation and the full privatization groups because asset-transfer privatization, i.e., lease-back model, does not yet exist in privatization cases of public transportation; the

lease-back model is seemingly irrelevant to the practical privatization decision in this field. Comparing the other two privatization categories, the full privatization group, by definition, has a higher degree of privatization than the privatized operation group in which only operation rights are shifted to the private sector, and is positioned at the far right in the diagram below (Figure 2-2). In comparison, the privatized operation group is located in the center of the diagram.

Figure 2-2: SPECTRUM OF OWNERSHIP MODELS



2.2 Governmental Control

Privatization is frequently misinterpreted as deregulation or removal of public control. The removal of governmental control can be defined as the abandonment of any form of public control or influence which controls the malpractice of profit-seekers, guides them to fair and sound competition, and protects the public interest and social welfare. Given this definition, privatization and the removal of public control are distinct concepts, as Vickers and Yarrows point out (1997).

Governmental control in a given industry can therefore be retained or even reinforced after privatization. Indeed, the privatization cases in which government continues to retain its prior control over an industry to which a company privatized by government

belongs can often be observed in both the U.K. and Japan. The municipal government and its transportation authority of London, Transport for London (TfL) fully privatized their globally renowned bus network in 1993 by selling operation rights and assets to the companies which used to be the subsidiaries of London Bus Ltd., a public enterprise. However, TfL did not abandon its role as planner and regulator to manage the competition among private bidders, service standards, and fare levels. In sum, the argument by the opponents of privatization that privatization distorts social equity and allows profit-seeking companies to behave free of governmental intervention is not necessarily true; it depends on decisions about the degree of retention of government control.

2.2.1 Governmental Control for a Rail Network

Governmental control or intervention is often desired to protect the public interest and to alleviate the public concerns about infrastructure companies such as railway companies which can be seen to have a natural monopolistic nature. The huge capital investment required for the construction of infrastructure would discourage potential competitors from entering the market and competing with an incumbent (Vickers and Yarrow, 1997, Gomez-Ibanez, 2003). Another important feature of infrastructure companies is, as Gomez-Ibanez points out, “immobility” (2003). Once infrastructure is constructed, it cannot easily be removed so that its provider cannot exit from the market. In other words, the infrastructure itself would become the exit barrier for an infrastructure company. This exit barrier discourages new entries because it is risky to commit to such a capital intensive and hard-to-exit business. Customers or residents in an area served by the provider are also immobile (Gomez-Ibanez, 2003); they cannot easily move out of the area to seek better infrastructure provision simply because it is costly for them to do so. Therefore, customers often have little choice or availability of substitutes. Because of huge capital investment and inflexibility, an infrastructure company tends to be a natural monopoly. In the context of public transportation, this argument is particularly true for a railway business.

Traditional regulators argue that a natural monopoly causes allocative inefficiency – the inefficiency in social resource allocation. A monopolist would seek “monopoly profit” which can be generated by providing services or products with prices set unfairly beyond marginal cost (Vickers and Yarrow, 1997). A monopolist can set such prices due to the lack of competition (i.e., customers have no choice but to keep paying even unfairly high prices). In this way, the income transfer from customers to a monopolist occurs via unfair prices.

Another issue of a natural monopoly is internal inefficiency or “X-inefficiency” (Leibenstein, 1966). X-inefficiency is organizational inefficiency caused by lack of managerial discipline mainly due to the absence of competitive pressure from outside the organization; managers in a monopoly do not have a real incentive to improve their company’s efficiency. Empirical studies show that the impact on the entire national economy from X-inefficiency is much larger and more problematic than that from allocative inefficiency at least in the capitalist developed nations (Leibenstein, 1966). Because a monopolist understands that an excessive monopoly profit pool (allocative inefficiency) invites further governmental intervention or cuts in subsidies, an infrastructure company voluntarily curbs its own monopolistic tendencies and hesitates to charge unfairly high prices; thus, allocative inefficiency due to a natural monopoly would be limited.

Government can correct inefficiency caused by a natural monopoly through a variety of form of intervention. First, government can take over such a natural monopoly and provide service directly to citizens so that government can prevent monopoly profit (i.e., allocative inefficiency). This is only effective when X-inefficiency is less important than the efficiency gained from the economies of scale because there is still no competition which can alleviate X-inefficiency. Second, in order to alleviate the allocative inefficiency, government can control prices and service standards of an infrastructure company via regulation or contract with the company without taking it over. This approach can be effective in the same way as the publicly-owned approach. However, this approach may

be able to reduce not only allocative inefficiency but also X-inefficiency by introducing quasi-competition such as yardstick competition or competition for franchising. Finally, a government can promote new entries and spur competition by removing entry and exit barriers. Nevertheless, this approach can be adopted only when the allocative inefficiency or X-inefficiency is more important than the efficiency from the economies of scale. It is also important to note that competition is not always an ideal situation particularly for infrastructure-based industries. It is sometime socially inefficient and costly to allow multiple companies to duplicate similar infrastructure in a given geographical market for the sake of competition (Vickers and Yarrow, 1997). In addition, each company in a competitive setting is more likely to focus on profit-maximization by abandoning unprofitable service lines which might be important to society.

2.2.2 Governmental Control for a Bus System

Unlike rail infrastructure such as subway networks, bus networks are relatively flexible. First, a bus system does not require as large initial investments as a subway network. Second, bus routes can be changed over time simply because routes are not fixed or dedicated only for a bus system (they can be shared with other transport modes). Third, multiple operators can operate within a single network because one route within the network is largely independent from other routes. Fourth, the efficiency gained of the economies of scale for a bus system is limited (Cowie and Asenova, 1999). Therefore, a bus system does not have the natural monopolistic nature of a subway network and seems more suitable for market competition at first glance.

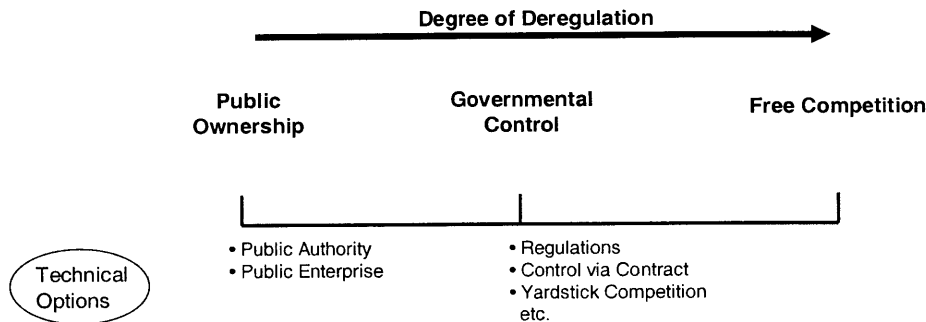
Then, why does local government directly own and operate public bus networks in so many municipalities throughout the world? The traditional rationale behind the public provision of bus services is that bus is a minimum and universal form of transportation for all citizens, particularly those who cannot use private alternatives. Indeed, competition among private operators does not guarantee the provision of unprofitable but socially necessary routes because profit-seeking operators are likely to exit from unprofitable routes. Some routes are profitable only for a single operator and do not allow additional

players to enter due to limited profitability. In such a case, an incumbent operator could leverage its monopolistic power if government would not prevent such monopolistic behavior through regulation. In addition, safety, congestion, and other social issues related to bus service provision would not necessarily be solved by market competition among private bus operators. In sum, a market mechanism alone does not necessarily serve all social needs (i.e., market failure). This is perhaps why many municipalities provide bus service directly.

However, like a natural monopoly, public provision of bus service is more likely to cause X-inefficiency. Because the public sector does not have to be concerned about profitability, the operation by the public sector tends to be economically inefficient by nature. Bureaucracy deeply rooted in public organizations aggravates economic inefficiency. Because of the lack of economic incentives, public bus operators tend to be less responsive to customers' voice or to the potential for innovation. As a result, service standards and quality of public bus services tend to be lower than those of private counterparts.

2.2.3 Spectrum of Government Control

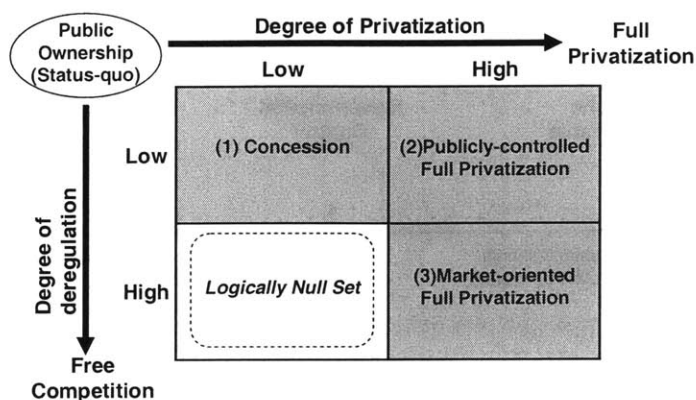
In sum, a government should determine the appropriate level of control between public ownership and free competition (i.e., zero intervention), considering the trade-off between allocative inefficiency/X-inefficiency and the efficiency gained from the economies of scale, particularly in the subway case, or alleviation of market failure in the bus case (Figure 2-3). Ideally, a government needs to come up with a balanced solution which can alleviate allocative and X-inefficiency, while at the same time retaining the benefits of the economies of scale or the alleviation of market failure. It is also important to note that because this balanced solution can be introduced only by government, governmental control is important in designing an effective managerial model.

Figure 2-3: SPECTRUM OF GOVERNMENTAL CONTROL

2.3 Privatization Models for public transportation

Figure 2-4 presents a matrix that combines the degree of privatization and market-orientation discussed above. Three privatization models are identified: (1) concession, (2) publicly-controlled full privatization, and (3) market-oriented full privatization. The bottom left cell is empty because any model in which ownership belongs to government, even partially, cannot escape government control. Therefore, logically and practically, only the three models identified in the matrix can exist.

Figure 2-4: PRIVATIZATION MODELS



(1) Concession: In this model, only operation rights are transferred from a government to a private operator, and asset ownership is publicly-retained. By definition, the degree of market-orientation is low because a government influences or controls a private operator's behavior through **asset** ownership and contract. Examples of this model are SMRT and most privatization cases in the US. Although SMRT is an independent stock-listed corporation, its rail network is leased from the Singapore Government on a 30-year term. SMRT needs to follow strict approval procedures and use a price-setting formula determined by the government although SMRT retains fare collected from customers as its revenue based on the franchising contract. The service standards in terms of quality and quantity are also provided by the government which monitors the operation of SMRT. In municipal bus privatization cases in the US, a municipal government typically contracts with a private bus operator only for operation based on predetermined service standards and prices. The operator's revenue is usually a contract fee based on a cost-plus scheme, not the fare-box revenue collected directly from passengers. Government carefully monitors the operator's performance and replaces an underperforming operator with a new operator by not extending the contract. In this way, a municipal government can control the private contractor's performance, although it is

sometimes difficult for a municipal government to monitor and control an operator perfectly as many cases exemplify.

(2) Publicly-controlled full privatization: Although both asset ownership and operation rights of publicly-provided transportation are transferred to the private sector, government is deeply involved with fare setting and/or service planning via either regulation or other means in this model. In addition, government typically controls the competition itself by managing the number of entrants or forms of competition by applying a public tendering process or simple entry regulation. The key feature of this model is that the dual benefits of competition and public control can co-exist. As a result, allocative inefficiency and X-inefficiency can be alleviated while at the same time economies of scale can be retained.

Typical cases of this model are the privatization of Japan National Railway and London Bus. In 1987, Japan National Rail was privatized and divided into six regional companies. Among the six companies, Japan Rail (JR) East, JR West, and JR Central listed their company stock in the major stock exchanges in Japan and have since operated essentially without subsidies from the central government. All of the residual debts as of 1987 were also assigned to those three companies because they cover advantageous regions. The other three companies, JR Hokkaido, JR Kyushu, and JR Shikoku, cover three islands which are rural regions with low population density and thus retain financial support from the central government. As already mentioned, the central government has controlled, in particular, fare levels and safety standards rigorously through regulation in Japan. As will be discussed in detail in Chapter 4, the fare level of all railway and bus transportation systems are determined based on a yardstick competition approach by the Ministry of Land, Infrastructure, and Transport (MOLIT). Thus, even after full privatization (IPO), JR East and other privatized regional companies cannot change fare levels freely.

Similarly, post-privatization London bus companies are heavily controlled by TfL. By 1993, all subsidiaries of London Bus Ltd., a public enterprise that owned and operated London

Bus, were fully privatized (Rye and Wilson, 2002); the assets were sold to succeeding private companies. The operation rights for each bus route is awarded to a private company which offers the lowest contract price for given service standards stipulated by TfL in a competitive tendering process (Lawton-Smith, 1995). In this way, TfL retains full control over planning, scheduling, and fares (Rye and Wilson, 2002) and introduces managed competition through a competitive tendering process.

(3) Market-oriented full privatization: In this model, government not only transfers both asset ownership and operation rights to the private sector but also greatly relinquishes its control and influence by removing regulation and permitting competition. The underlying principle in this model is that sound market competition should restrain a privatized company and encourage it to improve efficiency.

Privatization of the UK local bus services outside London is an example of this model. Based on the transportation act of 1985, deregulation and privatization of bus operation occurred throughout the UK except London (the privatization of London Bus occurred in 1994). As a result of deregulation, market entry was liberalized based on the Transportation Act of 1985 (Gomez-Ibanez and Meyer, 1990, Rye and Wilson, 2002); any private operator could begin operation 42 days after registration. Unlike the privatization of London Bus, the UK government allowed free competition among local bus operators based on the belief that sound market competition alone would lead to better cost efficiency and improve services at optimal fare levels (Rye and Wilson, 2002). Although on-the-street competition did not always occur after privatization, a potential threat of new entries due to the removal of regulatory entry barriers and relatively small upfront investment provided sufficient pressure on an incumbent to improve performance (Gomez-Ibanez and Meyer, 1990 and 1993). As a result, approximately 80% to 85% of local bus routes are operated on a commercial basis (without subsidies) (Lawton-Smith, 1995, Rye and Wilson, 2002). Local bus authorities were privatized by selling their assets to private investors, to an existing management team (i.e., MBO), or to a labor union (i.e., EBO). Relatively small operators which could not compete effectively were gradually

acquired by larger companies. Through merger and acquisition, the top five bus operating companies controlled 52% of the local bus service market in the UK as of 1997 (Cowie and Asenova, 1999).

2.4 Concluding remarks

In addition to the status quo (i.e., the continuation of current public ownership), the three privatization models, concession, publicly controlled full privatization, and market-oriented full privatization, should be examined in choosing an effective management model for a given public transportation service and network. In selecting to one model, a decision-maker should examine the social, operational and financial impacts of each model and compare the impacts of one model versus others as this thesis will do in the following chapters. Before the comparative analysis of the three privatization models and the status-quo are discussed, the basic profile of and the privatization argument for Yokohama's transit networks will be introduced in the next chapter.

Chapter 3: Privatization Argument in Yokohama

This chapter introduces the case of the municipally-owned public subway and bus systems in Yokohama, with an illustration of the privatization debates in the city. First, to provide the context for the debate, the reform introduced by the young mayor of Yokohama is briefly described. Then a brief description of the municipal transit systems in Japan is presented, and the basic profile of Yokohama's transit networks is introduced. Finally, the privatization debate in Yokohama is summarized and analyzed.

3.1 Nakada's Reform

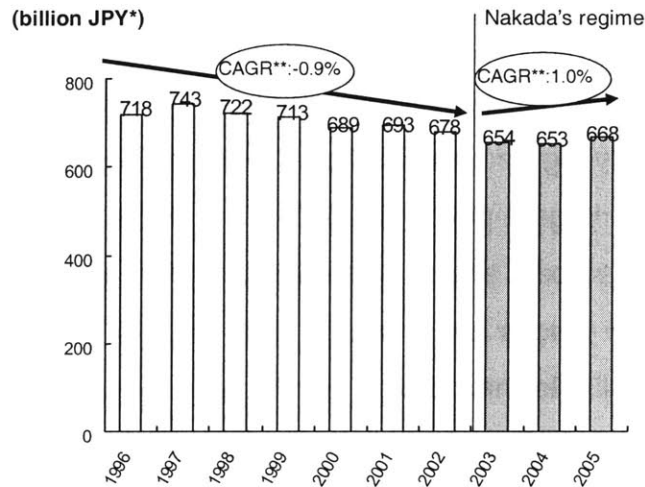
In 2002, the citizens of Yokohama, the second largest city in Japan in terms of population (3.5 million), celebrated the election of the youngest mayor in Japanese history. Mr. Hiroshi Nakada who became the mayor of the City of Yokohama when he was thirty-eight years old had previously been a congressman in the Diet and had abundant political experience for his age. The majority of citizens voted for him as their mayor because they had been concerned about the poor prospects for their city and because their mistrust of traditional politics had reached a peak.

Mr. Nakada did not betray the trust of his supporters. Immediately after he took office, he launched several programs to reform the inefficient municipal bureaucracy by introducing managerial methods commonly used in the private sector, to improve the city's disastrous finances by eliminating unproductive public works, and to provide citizen-oriented public services. He halted the downward trend of municipal tax revenue and kept the amount of municipal bonds issued low (Figure 3-1& 3-2).

Furthermore, based on his fundamental belief that government should involve the private sector in fields where it can provide service more productively than the public sector, Mr. Nakada has leveraged the private sector and let it take over some public services which used to be provided by the city. Among the public services Mr. Nakada has targeted, the

two public transportation networks are the largest ones in terms of their size and social and financial impact.

Figure 3-1: YOKOHAMA MUNICIPAL TAX REVENUE

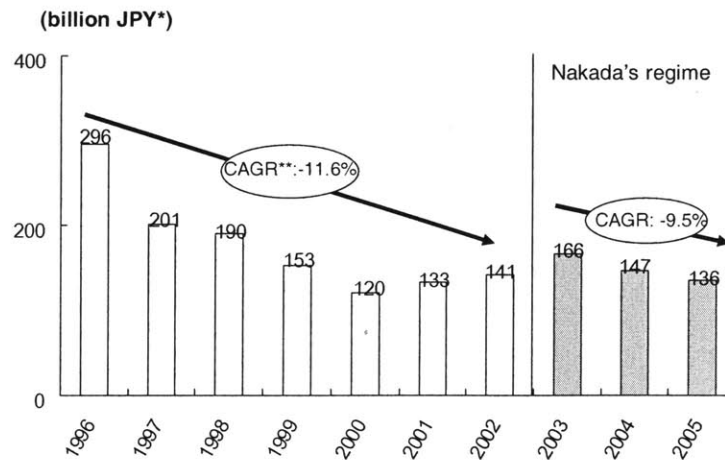


*\$1=¥115

** Compounded Annual Growth Ratio

Source: Annual Financial Condition (The City of Yokohama), T. Nakajima Analysis

Figure 3-2: YOKOHAMA MUNICIPAL BONDS ISSUED



*\$1=¥115

** Compounded Annual Growth Ratio

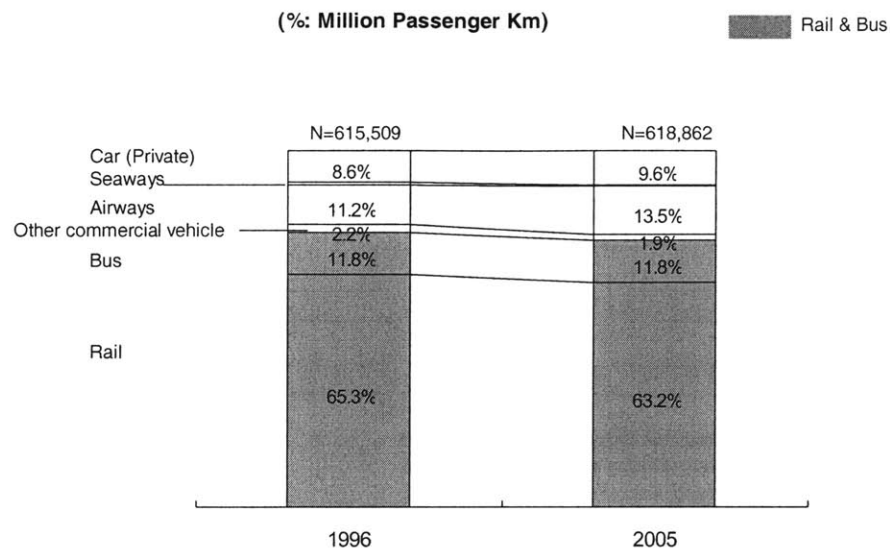
Source: Annual Financial Condition (The City of Yokohama), T. Nakajima Analysis

3.2 Municipal Public Transportation in Japan

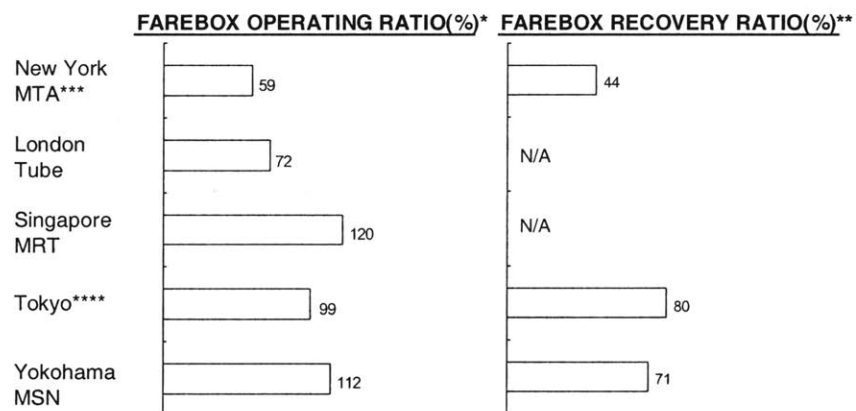
It is quite common for the municipal governments of the major cities in Japan to own and operate public mass transit networks. Currently, the nine government ordinance cities² including Yokohama provide mass rapid transit (subway) and bus services.

Metropolitan transit networks play a significant role in urban development in Japan. Considering the extremely high population densities particularly in the metropolitan areas, congestion is one of the largest policy issues for Japanese metropolitan municipalities. Workers who live in suburban areas generally prefer to use public transportation in commuting to their work places even though they usually own a car, because public transportation is more reliable than driving a car given the risk of being stuck in traffic. Many residents even with relatively high income who live near the city center do not even own a car because owning and using a car is expensive (renting a parking space is extremely costly because of the scarcity of land). This is why public transportation has maintained such a high transportation mode share (Figure 3-3). In sum, public transportation including bus and rail plays a more significant role than in other developed nations such as the US. And, thanks to this significant position of public transportation, both subway and bus systems in Japan can keep high fare-box operating and fare-box recovery ratios compared with other nations (Figure 3-4 and 3-5).

² Treated equivalent to prefectures

Figure 3-3: BREAKDOWN OF TRANSPORTATION MODE IN JAPAN

Source: MOLIT (2006), T. Nakajima analysis

Figure 3-4: FINANCIAL PERFORMANCE OF MAJOR SUBWAY NETWORKS IN THE WORLD

*Fare box revenue / operating cost (including depreciation):2005

** Fare box revenue / all cost excluding extraordinary cost :2005

*** Consolidated data including bus and subway

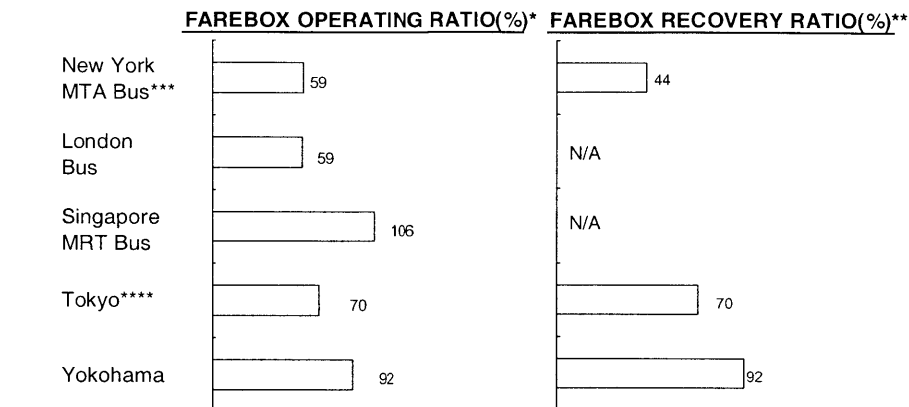
**** Toei Subway (Tokyo Municipal Subway)

Source: YTB: Financial Report 2006, Tokyo Metropolitan Government, TfL: Annual Report 2005,

MTA NYC: New York City Transit Financial Ratio, SMRT: Annual Report 2006

Transit, SMRT:Annual Report 2005, T.Nakajima Analysis

Figure 3-5: FINANCIAL PERFORMANCE OF MAJOR BUS NETWORKS IN THE WORLD



*Fare box revenue / operating cost (including depreciation):2005

** Fare box revenue / all cost excluding extraordinary cost: 2005

*** Consolidated data including bus and subway

**** Toei Bus (Tokyo Municipal Bus)

Source: YTB: Financial Report 2006, Tokyo Metropolitan Government, TfL: Annual Report 2005,
MTA NYC: New York City Transit Financial Ratio, SMRT: Annual Report 2006
Transit, SMRT:Annual Report 2005, T.Nakajima Analysis

Urban rail networks between the suburbs and the city center have been well-developed by the private sector in Japan. In contrast, the underground rail networks in large metropolitan areas have to date been developed and operated by the public sector. This is largely because the construction of a subway system requires major investment which is usually beyond the financial capacity of private investors. They simply cannot endure financial loss over a long period caused by the huge burden of depreciation and debt obligation. Without manipulating fare levels, private investors cannot meet their targeted rate of return. Furthermore, subway systems have been the only practical way to transport the large number of commuters in major cities with limited land without destroying the existing dense and complex metropolitan landscape.

Similar to the subway system, metropolitan bus networks in the major cities have been developed by the public sector, although it is difficult to find strong financial reasons for public involvement in bus operation. In fact, there are many cases in which private bus operators provide transit service in many small and medium size cities in Japan. In

addition, many private bus operators which are usually subsidiaries of private railway companies have recently entered into the metropolitan bus markets and compete with existing municipally-provided bus service.

The arguments for and against privatization of these metropolitan public transit networks have been made in almost all major cities and indeed have become intense, of late. One of the major arguments is that public authorities are less efficient and disciplined than private operators. Consequently, the municipally-owned transit operation incurs financial deficits which lead to increases in the tax burden of citizens. Another and perhaps more important (hidden) motivation of the privatization is heavy municipal debt. Because the major cities are struggling to pay back their mammoth debt and the associated interest, policy-makers could find an effective source of capital which can be used for debt repayment if they could sell the large transit networks which themselves have been one of the major sources of the giant debt. Indeed, The Tokyo Metropolitan Government and the central government corporatized the subway network which used to be owned and operated by the Teito Rapid Transit Authority and established Tokyo Metro Co. Ltd. in 2003. Although the two governments still retain all equity of Tokyo Metro, they plan to sell shares to private investors gradually and to privatize the company fully in 2009, in order to obtain sales proceeds.

3.3 Municipal Transportation Systems in Yokohama

3.3.1 Yokohama Municipal Subway Network

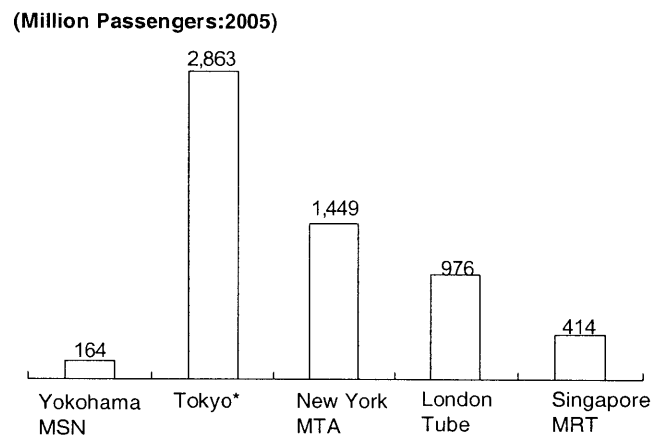
Yokohama Municipal Subway Network (YMSN) began operations in 1972. The network is relatively small compared with the major global subway systems in terms of the number of annual passengers (Figure 3-6). The annual ridership is 164 million in 2005, which has grown steadily since 1980 (a compounded annual growth rate of 5.42%), although the number has been far below the initial demand prediction³ (Figure 3-7). The length of the system is 40.4 km with two lines (*Ichigo-sen* and *Sango-sen*) which form one long

³ It is frequently observed that officials and planners in Japan present too optimistic demand prediction in order to approval for the construction of public infrastructure or operating license.

linear-shaped network (Figure 3-8). As of 2005, there are 32 stations and 228 rail cars.

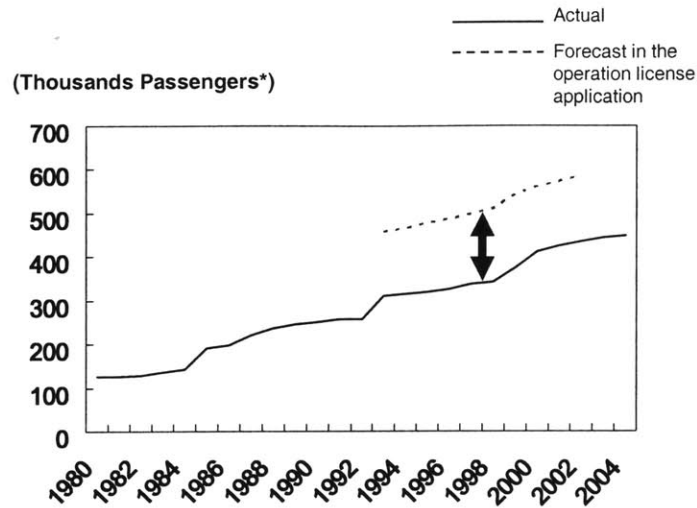
Although the ridership as well as operating revenue from the fare-box and advertising fees have increased steadily, it took 30 years to make its first positive operating profit. In fiscal year 2002, YMSN earned an operating profit of 1.8 billion yen, and it has remained in the black since then. Because of the nature of infrastructure business, huge depreciation cost has squeezed the operating profits of YMSN. However, more importantly, YMSN's lower cost efficiency, particularly its high wage level, compared with its private counterparts, is another important factor contributing to the slow take-off.

Figure 3-6: ANNUAL RIDERSHIP OF MAJOR SUBWAY NETWORKS IN THE WORLD

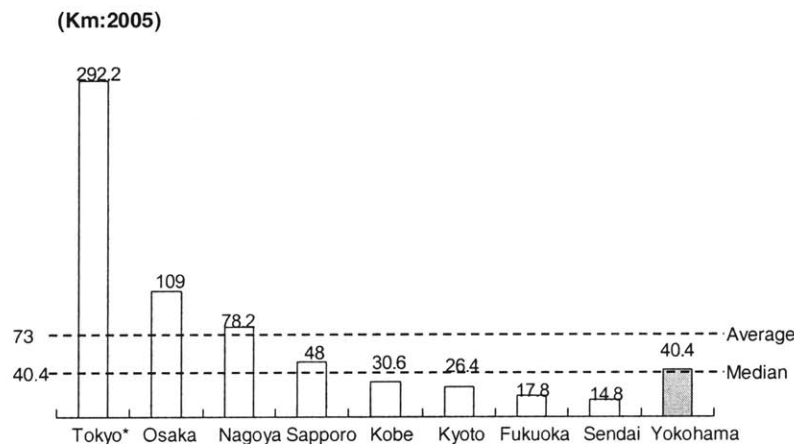


* The sum of the annual ridership of Tokyo Metro Co. Ltd. And Toei Subway (Tokyo Municipal Subway)

Source: Yokohama Statistics Portal, Tokyo Metropolitan Government, TfL: Tube Facts, MTA NYC Transit, SMRT:Annual Report 2005, T.Nakajima Analysis

Figure 3-7: PASSENGERS PER DAY – FORECAST vs. ACTUAL

* The data for the prediction between 1980 and 1992 and between 2002 and 2004 is not available
 Source: The Report from the Ad-hoc Committee of Yokohama Public Transportation (2003)

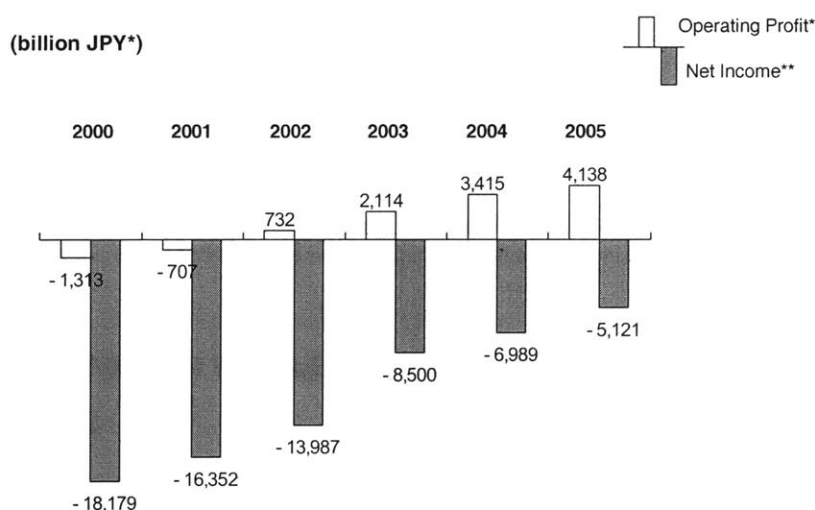
Figure 3-8: LENGTH OF MUNICIPAL SUBWAY NETWORKS IN JAPAN

* The sum of the length of Tokyo Metro Co. Ltd. And Toei Subway (Tokyo Municipal Subway)
 Source: The City of Yokohama & Ad-hoc Committee of Public Transportation (2003), T.Nakajima Analysis

Unlike the operating profit, net profit has remained negative since the start of service. In FY 2005, the net loss of YMSN was 5.1 billion yen (Figure 3-9). This continuously

negative net profit is attributed primarily to the huge interest payment on the debt accumulated in YMSN. For debt interest obligation alone, YMSN spent approximately 15.6 billion yen in 2005. Because subsidiary or financial support from the city and other public sources are already reflected in net profit, the loss needs to be covered by additional debt. And, this additional debt incurs further interest obligation which further squeezes net income. To stop this vicious cycle, the city is looking for a creative solution.

Figure 3-9: OPERATING PROFIT VS. NET INCOME - YMSN



* Operating profit = (Fare-box revenue + Advertising Fee) – (Labor cost + Adm. & Misc. cost + Depreciation)

** Net Income = Operating Profit + Subsidy – Interest – Extraordinary

Source: Yokohama Transportation Bureau: Financial Reports (2005 & 2006), T. Nakajima Analysis

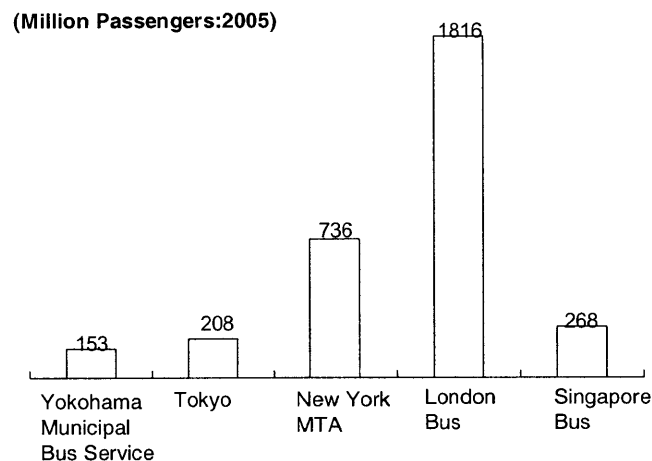
The city is now constructing the third line (*Yongo-sen*) which is expected to be open in 2008. The construction of this new line has been controversial. First, this construction has drastically increased the capital burden of the city which already suffers from snowballing municipal debt obligations. Second, high demand on this new expensive subway line cannot be expected because of the relatively low population density around the line and because of competition from private railway companies. Third, the actual construction cost has far exceeded the original budget (Ad-hoc Committee, 2003). Furthermore, this line is designed to be powered by a linear induction motor system, which is different from the third rail electric system used on the two existing lines, so that rolling stock used on the existing lines cannot run onto the new line and vice versa (i.e.,

economies of scale are not easily realized between the existing lines and new line).

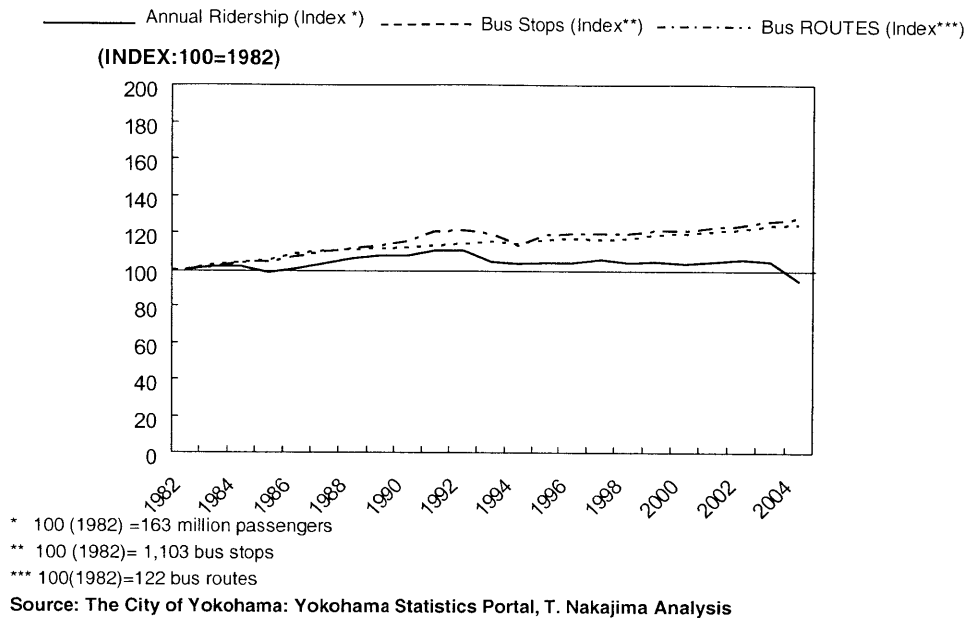
3.3.2 Yokohama Municipal Bus Service

The bus network provided by the City of Yokohama is much smaller than major municipal bus services around the world in terms of the number of annual passengers (Figure 3-10). In FY2005, the ridership of Yokohama Municipal Bus Service (YMBS) was 153 million, while that of London Bus, the world's largest urban bus network, was 1,816 million. YMBS' ridership has been unimpressive since 1992, the peak ridership in its history, in spite of aggressive efforts to expand the system by adding more bus stops and routes (Figure 3-11). As of 2005, the number of bus stops, routes, and vehicles of YMBS are 1,373, 156, and 1,008, respectively.

Figure 3-10: ANNUAL RIDERSHIP OF BUS NETWORKS IN THE WORLD



Source: Yokohama Statistics Portal, Tokyo Metropolitan Government, TfL: Annual Report 2005, MTA NYC Transit, SMRT:Annual Report 2005, T.Nakajima Analysis

Figure 3-11:GROWTH OF YOKOHAMA BUS NETWORK

Because approximately 40% of YMBS' bus routes operate at an operating deficit⁴, the city and Yokohama Transportation Bureau (YTB) are now reviewing the operation plans for these lines and considering restructuring. The city and YTB transferred the operating rights for 9 routes to private bus operators, former competitors, at the end of 2006 at no cost. YTB also plans to abandon an additional 30 unprofitable routes, most of which can be substituted by adjacent routes in 2007⁵.

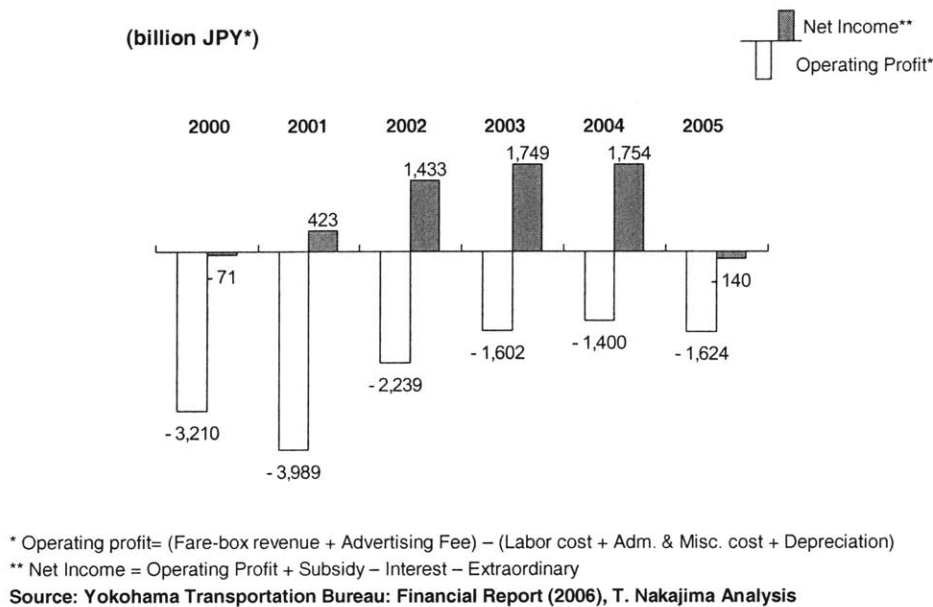
Similar to the recent unimpressive ridership growth, the financial performance of YMBS has also been problematic. Both fare-box revenue and advertising revenue have been decreasing, at the same time that operating cost has been reduced. As a result, operating profit still remains negative. In FY2005, operating revenue, operating cost, and operating income are 26, 27.4, and -1.4 billion yen, respectively. In comparison, net income has usually been positive since 2001 due to subsidies from the city and other

⁴ Based on the interview with the city's officials and data provided in January, 2007

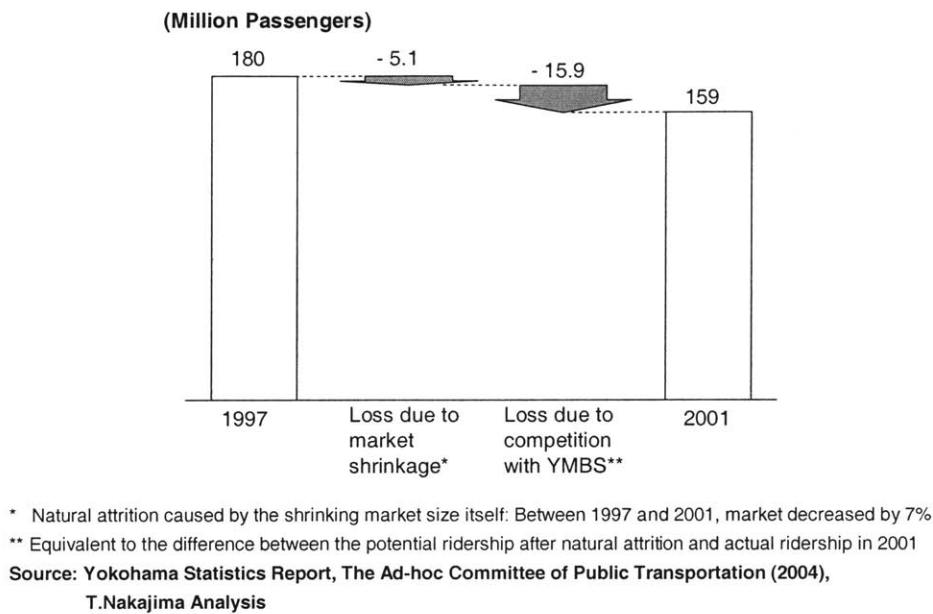
⁵ YTB proposed "the 15-minute-walk accessibility rule" in which a bus stop is abandoned if there are more than two stops or railway stations within 15 minute-walk from the stop.

public sources while net income in 2005 is -140 million yen because of 983 million yen of extraordinary cost (Figure 3-12).

Figure 3-12: OPERATING PROFIT VS. NET INCOME - YMBS



There is another outstanding issue for YMBS, other than problematic operating performance. As already mentioned, seven private bus operators operate in the city principally on the periphery with lower population density and hence lower demand. They are interested in operating in the center of the city, which is now monopolized by YMBS. Furthermore, some YMBS routes have extended into the areas served by private operators and are now competing with private routes. As a result, the private operators lost 15.9 million passengers between 1997 and 2001 (Figure 3-13).

Figure 3-13: LEAKAGE OF RIDERSHIP IN PRIVATE BUS OPERATORS

3.4 Privatization Arguments in Yokohama

3.4.1 Birth of the Ad-hoc Committee

On March 13, 2003, The Ad-hoc Committee of Public Transportation (The Ad-hoc Committee) was organized by Mr. Nakada, and launched a series of discussions. The Ad-hoc Committee consisted of five members of a various backgrounds including railways, privatization consultant, accountant, and scholar. The chairman of the committee was the president of JR East, the largest railway operator formed from Japan National Railways in 1987 through the IPO-based privatization. The fact that most of the committee members were appointed directly by the mayor implies that this ad-hoc committee was given high priority (In Japanese municipalities, members of an ad-hoc committee are usually recommended by government officials and approved by a mayor).

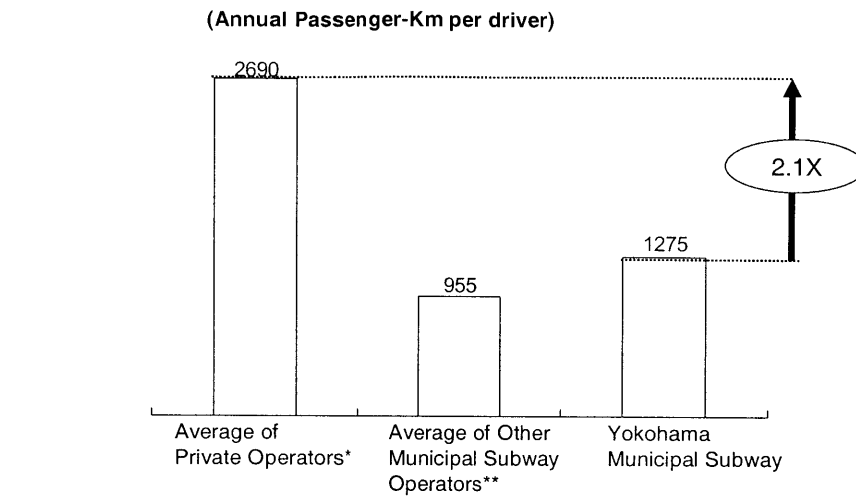
The primary objective of the Mayor's Ad-hoc Committee was to examine alternatives and propose an effective managerial option for the two municipally-owned public transportation networks, subway and bus, which are now owned and operated by Yokohama Transportation Bureau (YTB). Three main factors motivated the mayor to set

up the Ad-hoc committee:

1. The fiscal performance of the two networks had not significantly improved as the mayor had expected. The bus system continued to generate operating losses so that it could not be run without substantial subsidies from the City of Yokohama. Although the subway network generated operating profit⁶, it did not show positive net income⁷ because of the huge interest payment on the accumulated debt issued for the past construction and additional rail line expansion.
2. The productivity of the city's two networks fell far below the average productivity of the private public transit operators running in and around the city. For example, passenger kilometer per train-driver of the subway is 53% below the average for three private railway operators (Figure 3-14). Operating cost per kilometer of the city's bus operation is 20 % higher than the average for the seven private bus operators operating in and around the city (Figure 3-15).
3. The city could not continue to fund the financial deficit and support the debt of the city's public transportation networks because the entire city's fiscal condition had been worsening at the same time. Mainly because of the significant decrease in municipal tax revenue caused by the long economic downturn and declining population, the annual revenue of the city had worsened before Mr. Nakada became mayor. Furthermore, although Mr. Nakada has struggled to control the amount of bonds issued annually, the accumulated municipal debt had not been reduced (Figure 3-16). Given this financial constraint, the city was unlikely to continue to support its problematic public transportation systems.

⁶ (Fare-box Revenue + Advertising Revenue) – (Labor Cost + Administrative Cost + Depreciation)

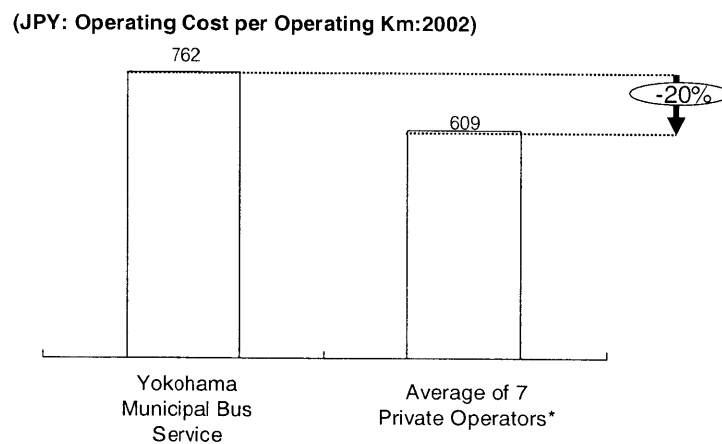
⁷ Operating profit + (Subsidies etc.) – (Interest payment)

Figure 3-14: PRODUCTIVITY OF RAIL OPERATORS

*Three private railways operators operating in and around Yokohama: Tokyu, Keihin-Kyuko, Sagami-Tetsudo

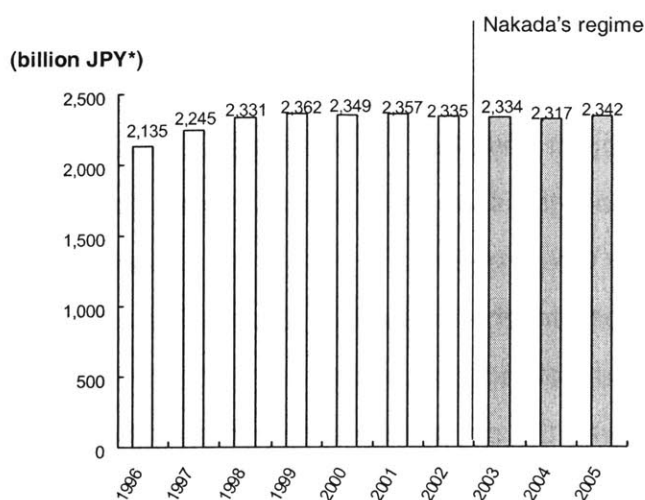
** Sapporo, Sendai, Tokyo, Nagoya, Kyoto, Osaka, Kobe, Fukuoka

Source: The Report from the Ad-hoc Committee of Yokohama Public Transportation (2003)

Figure 3-15: COST PRODUCTIVITY – YMBS VS. PRIVATE BUS OPERATORS

*Private companies operating in Yokohama

Source: The Report from the Ad-hoc Committee of Yokohama Public Transportation (2003)

Figure 3-16: YOKOHAMA RESIDUAL MUNICIPAL DEBT

*\$1=¥115

Source: Annual Financial Condition (The City of Yokohama), T. Nakajima Analysis

3.4.2 Ad-hoc Committee's Findings

The Ad-hoc Committee submitted the final report for the subway network in September, 2003 and that for the bus network in January, 2004. In both reports, the Ad-hoc Committee proposed full privatization of Yokohama's public transit networks. The full privatization suggested by the Ad-hoc Committee is privatization based on an Initial Public Offering (IPO). Namely, the city would corporatize the two public transit networks and ultimately sell their stock to private investors.

The Ad-hoc Committee's Report concluded that YTB alone cannot generate positive profit and settle the enormous accumulated deficits for the two network operations because YTB lacks sufficient managerial discipline, managerial freedom, and competitive pressure due to its bureaucratic nature. With respect to the bus operation, to produce positive operating profit, YTB had to improve its productivity by aggressively reducing its operating cost, in particular labor cost, to the level of its private counterparts. However, the committee believed that YTB was incapable of taking such a drastic reform both because YTB lacked the required managerial discipline and skill, and because YTB was

unlikely to be unwilling to risk damaging itself and its employees voluntarily.

The committee also argued that YTB's internal reform alone, even if successful, could not settle the accumulated debt, particularly for the subway network. This mammoth debt incurs a huge annual interest payment which causes constant net loss. To fill the deficit, the city would then need to issue additional bonds. To stop this vicious cycle of snowballing debt, the city would need to find a source of funding the debt obligation. This is probably the primary reason why the Ad-hoc Committee chose IPO-based privatization through which the city could obtain proceeds from private investors by selling the stock of privatized entities. However, the committee's logic in choosing this option was not clearly stated in the reports.

The additional point the committee made is that the city has no reason to keep providing the two public transit services because private bus and railway companies operate in and around the city and because they have positive operating profit from their transportation business alone. The committee pointed out that, in principle, government intervention is appropriate only when the private sector cannot provide socially necessary services such as universal transportation service. There are seven private bus operators in Yokohama and four private railways companies. In such a situation, if the city government continues to keep providing public transit service, sound market and competition among private companies would be seriously damaged. Indeed, the city bus operation has an advantage over the private operations in the sense that the city's bus lines usually locate in the areas with high population and business density. In addition, the committee noted that several bus lines compete directly with private bus lines.

3.4.3 Critique of the Ad-hoc Committee Reports

Based on the above analytical arguments, the committee concluded that the city should privatize its public transit networks. However, there are several flaws in the reports. First, as already mentioned, the reports did not present a clear logic or rationale for choosing the IPO-based privatization. The committee seemed to consider only two options for the

bus system: the IPO-based privatization and direct asset-sales to one or more private operators. It is not clearly stated why the committee considered only these two similar options (both options are essentially same in that they are full or asset-transfer privatization) or why the committee chose the preferred option. For the subway network, the report presented only one option, which is again the IPO-based privatization. In sum, there is a feeling that the Ad-hoc Committee's arguments and reports were based on the pre-determined assumption of full privatization from the beginning.

Second, the discussion and the two reports by the committee do not seriously assess non-financial aspects of public transportation, particularly the public interest including the influence on fare levels or the treatment of unprofitable but socially necessary lines. The committee judged that public operation and ownership are inferior to those of the private sector simply by comparing productivity and financial results. The city's bus operation might save unprofitable but socially necessary lines which the private operators are reluctant to save. Without considering the public interest and by directly comparing productivity or financial figures, the conclusion that the city should fully privatize the public transit system sounds like a leap of logic based on a superficial argument.

Finally, the two reports did not even present the fiscal impact of the IPO-based privatization that the committee proposed while the reports did include the profit-loss scenario of the status-quo. Without presenting the valuation of the proposed option, the conclusion that the city should fully privatize its public transit networks is not cogent. Without the evidence, how could Mr. Nakada and the citizens of Yokohama make a decision whether to go with the proposed option? It should have been the responsibility of the committee to analyze and present how much the proposed option could improve the city's fiscal condition and ultimately contribute to the citizens' welfare.

3.4.4 Counter Proposal from Yokohama Transportation Bureau

As the official response to the Ad-hoc Committee Reports, Yokohama Transportation Bureau (YTB) developed reform plans for the subway and bus network. Basically what

YTB proposed is a simple extension of the status-quo in which YTB continues to own and operate the bus and subway networks although YTB insisted that it could improve the performance of the two public transit systems more aggressively than before.

Subway: YTB's proposal for the subway reform implied that YTB did not accept the IPO-based privatization suggested by the committee. Although YTB promised that it will make the final decision on whether to take the option of the IPO-based privatization in the future, YTB did not clearly state when it would make the decision. In this way, YTB intended to leave this decision date unspecified.

In addition to the IPO-based privatization recommended by the Ad-hoc Committee, YTB considered three additional options: the improved public enterprise model (i.e., the simple extension of the status-quo), the independent administrative institution model, and the vertical separation model.

Dokuritsu-Gyosei-Houjin, an independent administrative institution, is one type of the legal public entity in Japan. A government can establish an institution for the service domain which does not necessarily require direct governmental provision of service, but which the private sector is unwillingly to provide. However, given the fact that four private railway companies already operate in and around Yokohama, this option was irrelevant from the beginning.

Vertical separation is one form of infrastructure privatization that separates operation from rail network (infrastructure). In this form, the public sector typically continues to own the rail network, and a private company is awarded the right of operation over the infrastructure. However, the comparison between the vertical separation which talks about the form of asset ownership and the other three options which talk about the type of entity is problematic because they are not mutually exclusive.

Bus: Similar to the subway network, YTB's counter-proposal did not follow the Ad-hoc

Committee's recommendations. However, unlike the proposal for the subway network, the counter-proposal for the bus system stated that YTB would make a decision in 2007 on which of three options, including the IPO, YTB will finally adopt. The difference in the clearness of timing between bus and subway may come from the different degree of confidence in the internal reform between the two networks. Namely, YTB would have more confidence in performance improvement in the bus operation because performance issues of the bus network were basically operational in the sense that the bus operation did not have the high level of debt that the subway operation had.

YTB considered three options: IPO-based privatization, direct asset sales, and improved public enterprise. However, the direct-asset sale to private investor(s) is essentially the same as the IPO-based privatization in the sense that both options transfer the public assets and the right of operation to private hands (i.e., the transition of the ownership of business).

3.4.5 Critique of the counter-proposal from Yokohama Transportation Bureau

As with the reports from the Ad-hoc Committee, there are several flaws in the counterproposal from Yokohama Transportation Bureau (YTB). First, the options considered by YTB are not comprehensive. YTB failed to present the reason or logic for considering specific options and excluding other options such as contracting-out.

Second, as already mentioned, the options presented by YTB are also not mutually exclusive; YTB compared the options of asset-ownership with those of the form of entity. For instance, vertical separation of the subway system can coexist with the IPO-based privatization.

Third, similar to the Ad-hoc Committee, YTB failed to present a clear rationale for choice among the options, although it presented a brief discussion of the advantages and disadvantages of each option and the estimate of additional cost required for each option. Because the additional cost is just a small part of the total value, it alone does not provide

a credible criterion for choice among the options. Thus, the comprehensive financial value created by each option should have been estimated and compared with other options.

Fourth, similar to the Ad-hoc Committee, YTB's counterproposal did not analyze any aspect of public interest. YTB simply addressed the feasibility of each option based on the legal constraints and internal factors such the treatment of the existing workers by a new entity. YTB's counterproposal lacked the citizens' and customers' perspectives although the public transportation policy issues should be based primarily on their perspectives and interests.

3.5 Concluding remarks

The financial and operating performance of Yokohama's municipally owned subway and bus system is poor. Combined with the city's poor fiscal condition, this poor performance of the public transit systems has raised the option of privatization. Under the direction of the aggressive reformer, Mayor Nakada, the Ad-hoc Committee of Public Transportation was established to review the issues under the current public ownership and develop a reform plan. Although the Ad-hoc Committee proposed that the city should privatize both subway and bus systems, their arguments lacked evidence supporting their recommendation and were not comprehensive. Likewise, the counterproposal developed by the Yokohama Transportation Bureau included several critical flaws, and its arguments were also not comprehensive. In the end, both parties seemingly represented their own interest groups (the Ad-hoc Committee for the mayor and YTB for itself) and did not present convincing arguments for the citizens of Yokohama. Given this incomplete and unsatisfactory argument on privatization, more comprehensive analysis should be conducted to present the strategic direction of the municipal transit systems in Yokohama.

Chapter 4: Social Impact of Privatization

This chapter examines the social impact associated with the privatization of public transportation and considers their implications for the municipal transit systems in Yokohama and other Japanese municipalities. Using the actual examples of privatization, the social impact of each privatization model defined in Chapter 2 is analyzed. To begin with, the key public concerns with privatization are discussed. Then, quantitative and qualitative analysis is presented to examine the validity of each concern using the data obtained from selected cases of privatization which are relevant to Japanese municipalities. Finally, synthesizing these analyses, this chapter recommends potentially desirable models for the municipal transit systems in Yokohama and other Japanese municipalities.

4.1 Public Concerns about the Privatization of Public Transportation

Privatization is always controversial. When a government announces a privatization plan for a given public service, intense arguments against privatization always arise. Opponents of privatization argue that privatization would damage the public interest and welfare. They view a privatized company just like a fierce tiger released from a cage; they argue that a privatized company released from government control will focus on profit maximization and sacrifice the public interest and welfare. In the privatization of public transportation, the following issues are frequently raised and used as major arguments opposing privatization.

- Fare increase: The opponents of privatization argue that a privatized company tends to increase fares greatly in order to improve profitability. Their underlying assumption is that a privatized company is an unregulated natural monopoly which can earn monopoly profits by raising fare levels.
- Worsened service quality: The opponents also argue that the service quality of public transportation tends to be worsened due to the profit seeking behavior of a privatized company. The key assumption behind this argument is again that a privatized

company is a natural monopoly which does not have to worry about the loss of customers to its competitors.

- Lower safety: Another argument against the privatization of public transportation is that the post-privatization safety level would be lower because a privatized company would focus on profit excessively and make light of the safety standards. Opponents also argue that the loss of experienced engineers and workers due to lay-offs or wage cuts after privatization would lower safety standards in the post-privatization era.
- Abandonment and dilution of socially necessary routes: Since a privatized company needs to maximize profit and shareholders' value, the opponents are concerned that a profit-seeker would be motivated to focus only on the profitable routes and abandon or decrease unprofitable but socially necessary routes or dilute the service provision over these routes. This abandonment or dilution combined with fare increases would harm low-income and other transit-dependent segments of the public.
- Layoffs: Opponents are also concerned that a privatized company would lay off existing workers or cut wage levels to increase profits. Among the items of operating expense, labor cost is usually the largest so that the impact from its reduction could be considerable. The labor unions in public entities usually strongly oppose privatization because they are afraid that a privatized company would be motivated to sacrifice labor in the interest of cost reduction.

Although these arguments seem plausible, their validity needs to be carefully examined based on the evidence from actual cases of privatization because, as earlier stated, the privatization argument frequently depends more on belief than on evidence. In particular, a distinction should be made on whether each issue is caused by deregulation or by privatization. To make such distinction, the validity of each issue should be tested along the two dimensions – the degree of privatization and deregulation. Finally for supported issues, the question of whether the concern is valid in the context of Japanese municipal public transportation should be addressed.

4.2 Fare Increases

Possible increases in the fare levels of public transportation after privatization are a legitimate public concern. Opponents argue that a privatized entity will increase fare levels unfairly for its profit and this will damage transit-dependent segments of the public. However, fare increases do not necessarily occur even after full privatization as long as government regulates a private operator effectively. Furthermore, even if fare increases do occur after privatization, there might be other factors, including deregulation, contributing to the increases; privatization itself might not be the reason for such increases. Opponents often attribute the post-privatization fare increase to privatization itself.

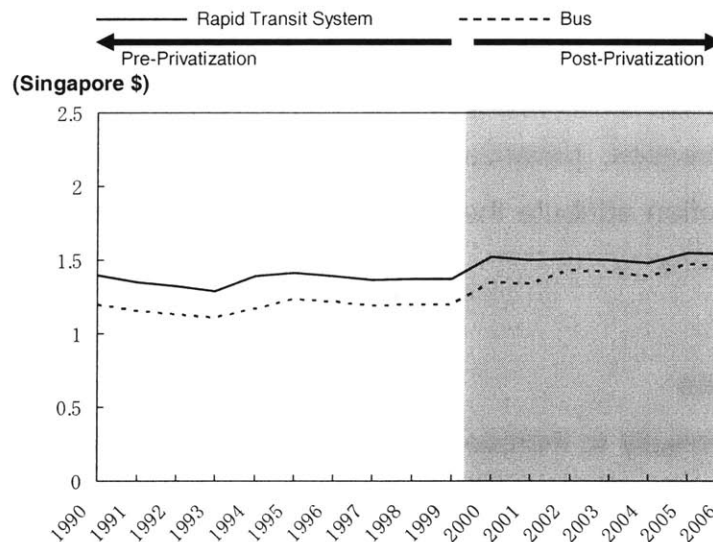
4.2.1 Empirical Analysis

Private operators are unlikely to increase fare levels in the privatization cases in which government effectively retains strong regulatory power over public transportation even after full privatization. In such cases, the public concern about post-privatization fare increase does not have validity from the beginning.

Indeed, in many cases of the privatization of public transportation, government prevents private operators from increasing real fare levels unfairly for the sake of their profit by retaining or introducing fare regulations. In the SMRT case which is an example of a concession model, the Singapore National Government and its Public Transportation Council (PTC) strictly control public transit fare levels. More specifically, the PTC determines the maximum fare levels using a formula, set by the Government Parliamentary Committee, which reflects inflation (Consumer Price Index) and real purchasing power (the change in national average monthly earnings over the previous year)(Lam and Toan, 2006). Based on the formula, SMRT or other private operators submit a fare adjustment application to PTC which must be approved by the council (SMRT, 2006). In sum, there is no room for private operators including SMRT to increase the fare level unfairly in order to enjoy monopoly rent even after privatization. Figure 4-1 shows the trends of real fare levels of the MRT system between 1990 and 2006, which

are measured by the maximum cash fares. In fact, between pre and post privatization eras, there is no significant change in fare levels although the fare levels increased slightly more than inflation right after privatization.

Figure 4-1: REAL FARE LEVEL OF SMRT



Source: Public Transport Council Statistics, T. Nakajima Analysis

Similarly, the regulations imposed by Japan's central government do not allow the JRs to manipulate the fare levels to make monopoly profits. Similar to the fare levels of other public transportation systems in Japan, those of the JRs have been strictly controlled by the central government (the Ministry of Land, Infrastructure, and Transport: MOLIT) through the yardstick competition scheme even after full privatization. The yardstick competition scheme is a regulatory method which promotes "competition between regulated units indirectly" (Vickers and Yarrow, 1997). The maximum fare levels that one operator can charge depends on the cost levels of others. By analyzing the operating cost level of operators, MOLIT first sets the annual standard unit cost by mode (railways and bus) and by region. If actual unit cost for a given operator is less than the standard unit cost, the median between the actual and standard cost is determined as the base unit cost. Then, the maximum fare level is determined by adding half of the cost reduction per unit achieved after the last fare revision to the base unit cost. If the actual unit cost of

a given operator is more than the unit standard cost, the standard cost is set as the base unit cost for the operator. The maximum fare level is then determined by subtracting half of the cost increase per unit from the base unit cost. Because the standard cost reflects the cost of other operators, the fare levels of a given operator depend on its cost performance relative to other operators. In this way, MOLIT introduces competitive pressure and an incentive for operators to be cost efficient, and controls the fare levels of each operator at the same time.

In fact, the fare levels of the JRs changed only once between 1987, the year of privatization, and 1999, and real fare levels have decreased since 1987 (Mizutani, 1999) (Table 4-1). In comparison, the pre-privatization fare levels had increased almost every year between 1981 and 1986 (Mizutani, 1999) at an average rate of 6.6%. This analysis of the fare revision of JRs since privatization is somewhat counterintuitive particularly for the opponents of privatization who argue that a privatized company tends to increase fares to obtain monopoly profits.

Table 4-1: FARE INCREASES FOR JNR AND JRs

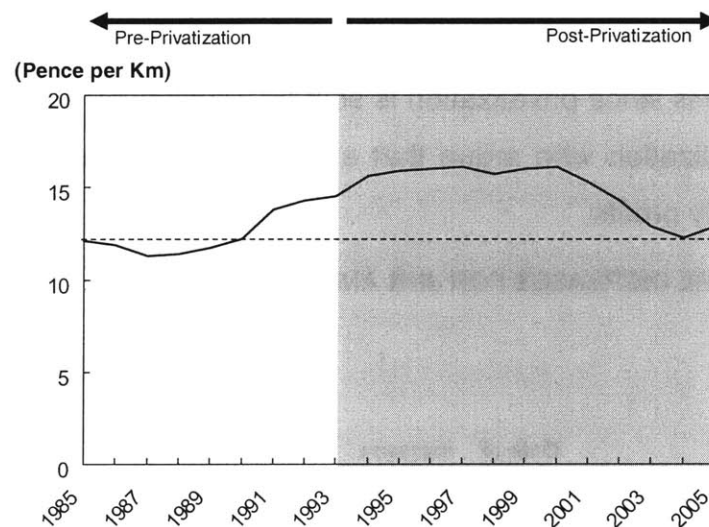
	Date of fare revision	Increase (%)	Inflation (%)	Infla-adj. Increase (%)
	1981/4/20	9.7%	4.8%	4.9%
	1982/4/20	6.1%	3.8%	2.3%
	1984/4/20	8.2%	0.9%	7.3%
	1985/4/20	4.4%	4.4%	0.0%
	1986/9/1	4.8%	0.7%	4.1%
Privatization →	1989/4/1	3.0%	3.0%	0.0%
	1997/4/1	1.0%	12.4%	-11.4%

Source: Mizutani (1999).

In the case of London Bus, which is another example of a PFP model, TfL and the mayor

of London directly control and determine the bus fare levels. TfL annually reviews fare levels based on inflation, the price elasticity to demand, and the prices offered by winning bidders. Based on this review, the mayor of London finally determines the fare level (Verma, 2007). Although private operators could narrowly influence the fare levels via the bid price, this is unlikely to be a significant factor due to competition in the bidding process. Figure 4-2 shows how the real average fare per kilometer changed between 1985 and 2005. Real fare levels rapidly increased from 1990 reaching a peak in 1997. Fare levels decreased from 16.1 in 2000 to 12.9 pence in 2005. This is perhaps because TfL intentionally held the fares constant from 2000 to 2003 in spite of inflation (TfL, 2003).

Figure 4-2: REAL FARE LEVEL OF LONDON BUS



Source: TfL: Market Report 2000, Travel Report 2005, T. Nakajima Analysis

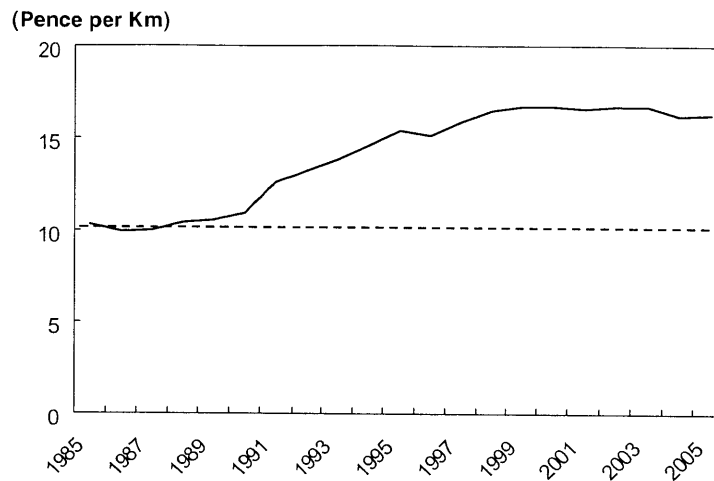
However, once government loses its regulatory power over the fare setting of public transit, the risk of real fare increases does arise. After privatization, the role of local Traffic Commissioners in setting fare levels was severely limited in UK local bus services (Cowie and Asenova, 1999). Due to the weak government power over fares, the fares for local bus services increased dramatically throughout the U.K. except for London. In two years after the privatization, the real fare level increased by 25% (Gomez-Ibanez and Meyer, 1990). Between 1985 and 1994, the fare levels increased by approximately 17%

(Lawton-Smith, 1995). According to the analysis for the longer term between FY1985 ('85 and '86) and FY1999 ('99-'00), real fare levels increased by 30% (Rye and Wilson, 2002). All these studies show that fare increases in real terms since privatization have been significant.

4.2.2 Discussion and Implications for Yokohama

As these cases indicate, opponents' arguments that privatization of public transportation will cause fare increase is not necessarily true at least in the developed nations. In the UK local bus services, the example of the market-oriented full privatization model, fare levels did indeed increase dramatically after privatization, however, this was due to deregulation of fares, not privatization itself. In fact, as the cases of the SMRT, JNR privatization, and London Bus suggest, a privatized company cannot easily influence the fare level when a government retains regulatory power even after full privatization. Furthermore, even under public ownership or before privatization, the real fare levels sometimes increase significantly as the cases above and the case of the London Underground show. Although the London Underground is still operated directly by the London Government (TfL), the real fare levels have increased drastically. Between 1985 and 2005, fares increased by 55% (Figure 4-3). In sum, whether fare levels increase does not depend on the extent to which a government retains ownership over public transportation (privatization). As the UK local bus and London Underground cases suggests, fare increase can be attributed to other factors, not to privatization.

However, it should also be noted that the private companies can sometimes put pressure on government or politicians to make regulations more favorable for them. Particularly when government depends on a single company for the provision of public transit services, such a company may attempt to exert its strong influence on fare regulation. To minimize the political pressures from the private sector, in many cases, government establishes an independent regulatory commission which independently monitors and regulates fares.

Figure 4-3: REAL FARE LEVEL OF LONDON UNDERGROUND

Source: TfL: Market Report 2000, Travel Report 2005, T. Nakajima Analysis

Given the above analysis, it can reasonably be concluded that the real fare levels of municipal public transit systems in Yokohama and other Japanese cities would not necessarily increase after privatization as long as the city or the central government retains their current regulatory power. Indeed, private railway companies in Japan maintain low fare levels due to the yardstick competition scheme employed by MOLIT. Similar to the JRs or other public transit operators, the municipal transit systems in Japan are subject to MOLIT's yardstick competition scheme.

4.3 Service Quality

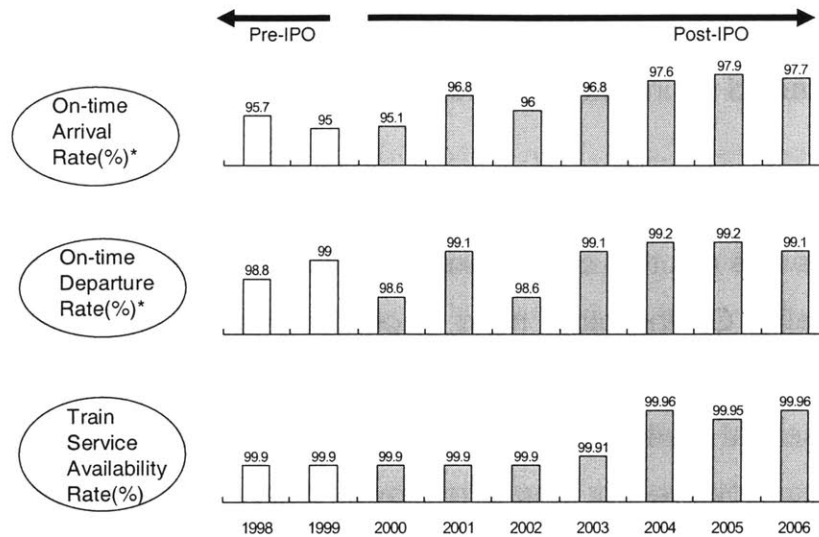
This section examines the public's concern that a privatized company might sacrifice service quality for the sake of profit. It is difficult to measure the impact of privatization on service quality because of the limited availability of direct measures of service quality. Some operators measure the level of customer satisfaction annually. Others measure the punctuality of arrival and departure, which is a partial measure of service quality. In addition, operators frequently do not disclose the data indicating operating performance and service quality in detail. Therefore, this research analyzes the privatization impact on

service quality for each case by examining what data are available. This thesis also measures the passenger growth of each case as an indirect measure of service quality given that the number of passengers will grow when service quality improves if the real fare levels are maintained (or increased) other things being equal.

4.3.1 Empirical Analysis

On the one hand, there is risk that cost reduction efforts by a private operator could lead to lower service quality. On the other hand, a private operator could improve service quality to attract more passengers in order to increase revenue. Both arguments seem plausible in the sense that a private company can increase profits either by cutting costs or enhancing revenue. However, for long-term growth, it seems more rational for a transit operator to obtain a strong customer franchise by providing better service. In fact, in all cases examined in this research, private operators have enhanced service quality since privatization.

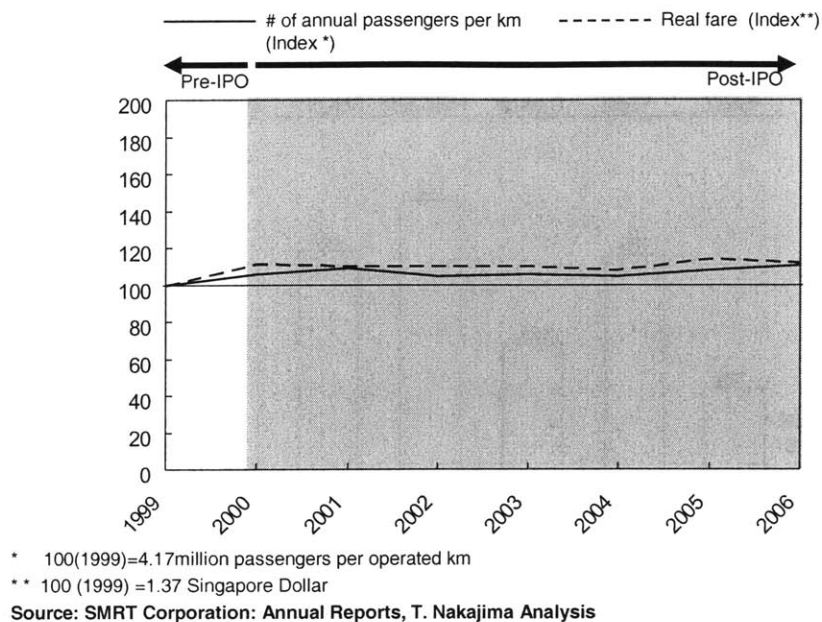
In the case of SMRT, service quality has improved in terms of several measures as shown in Figure 4-4 since the IPO in 2000. First, service punctuality has continuously improved over time; in 1999, the year before the IPO, the on-time train arrival rate was 95%, but this had improved to 97.6% in 2006. SMRT has also improved the on time train departure rate from 98.8% in 1999 to 99.1% in 2006. Second, the train service availability rate has been maintained at 99.9%. Given this performance, it is reasonable to conclude that the privatization of SMRT has had a positive impact on service quality (or at the very least, there has been no negative impact).

Figure 4-4: SMRT SERVICE QUALITY

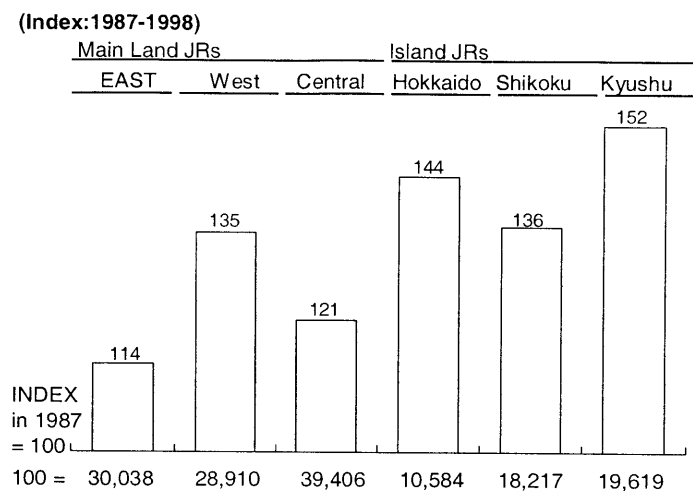
Source: SMRT Annual Reports 2003 & 2006, T. Nakajima Analysis

The number of passengers per kilometer has been growing steadily in spite of the real fare increases (Figure 4-5). Although it is difficult to determine how much the improvement of service quality alone has contributed to this passenger growth, the improvement should at least partially contribute to this growth because the real fare revenue increased after the IPO.

Figure 4-5: PASSENGER GROWTH VS. FARE CHANGE OF THE MRT SYSTEM



Similar to SMRT, the six Japan Railway Companies (JRs) have significantly improved service quality since full privatization in 1987. The service frequency, for example, has dramatically improved (see Figure 4-6), and more customer-oriented innovations such as a telephone reservation system and a clock-face timetable have been introduced (Fukui et al., 1994, Mizutani, 1999). As many experts have recognized, the precision of JR trains' arrivals and departures is almost an art form and meets the highest standards throughout the world in spite of the high frequency of service. Furthermore, many JR stations have also been remodeled for passenger convenience. For example, small retail sections with restaurants, grocery stores, and other specialty stores have been opened within major stations so that commuters can purchase goods on their way home without exiting from their transfer station.

Figure 4-6: CHANGE IN TRAIN DENSITY* OF JRs

* Train Km / Route Km

Source: Mizutani and Nakamura (2000), T.Nakajima analysis

Due to the improved service quality combined with other factors such as the decreased real fare levels, the number of passengers (passenger km) even including rural JRs operating in low population density regions has increased from 205 billion passenger kilometers in 1987 to 246 billion passenger kilometers in 2005 or a 1.02% annual compound growth rate.

Although the data before 2000 could not be obtained, the data between 2001 and 2005 indicates that the service quality of London Bus service has been improved and maintained at a high level (Table 4-2). The percentage of schedule operated has improved slightly and average excess waiting time on high frequency routes has decreased from 2 minutes in 2001 to 1.1 minutes in 2005. Finally, the passenger satisfaction levels have been slightly improved over this period. However, note that factors such as increased subsidy for private operators in addition to privatization itself might contribute to these improvements.

Table 4-2: SERVICE QUALITY OF LONDON BUS

	2001	2002	2003	2004	2005
Percentage of schedule operated(%)	96.1	96.1	97.2	97.7	97.7
Excess Wait Time* (Minutes)	2.0	1.8	1.4	1.1	1.1
Passenger Satisfaction**	75.3	76.0	77.0	77.0	77.0

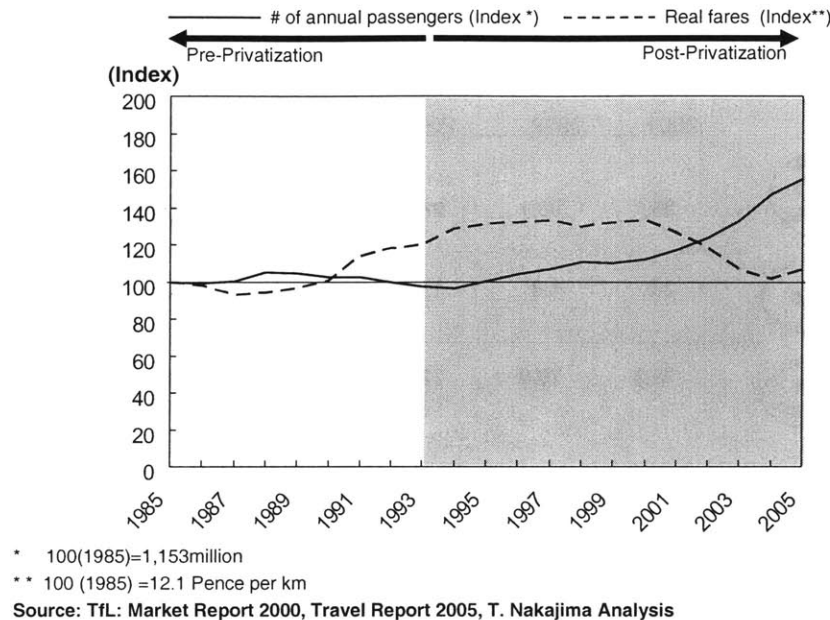
* Average of high-traffic routes

** Out of total score 100

Source: TfL: Market Report 2000, Travel Report 2005, T. Nakajima Analysis

In addition to service quality enhancement, some innovative services were also introduced after privatization including mini buses which allow operators to offer more frequent service on low ridership routes. Although these innovative services are planned and implemented by TfL, it would perhaps not be feasible without leveraging the capacity of private contractors.

Combining the analysis above with the fact that the number of passengers has been growing rapidly (Figure 4-7), the overall service quality of London Bus services do not seem to have been negatively affected by privatization. However, it should also be noted that factors other than the service quality (e.g., the congestion pricing introduced in 2003 and lower real fares) have also contributed to passenger growth.

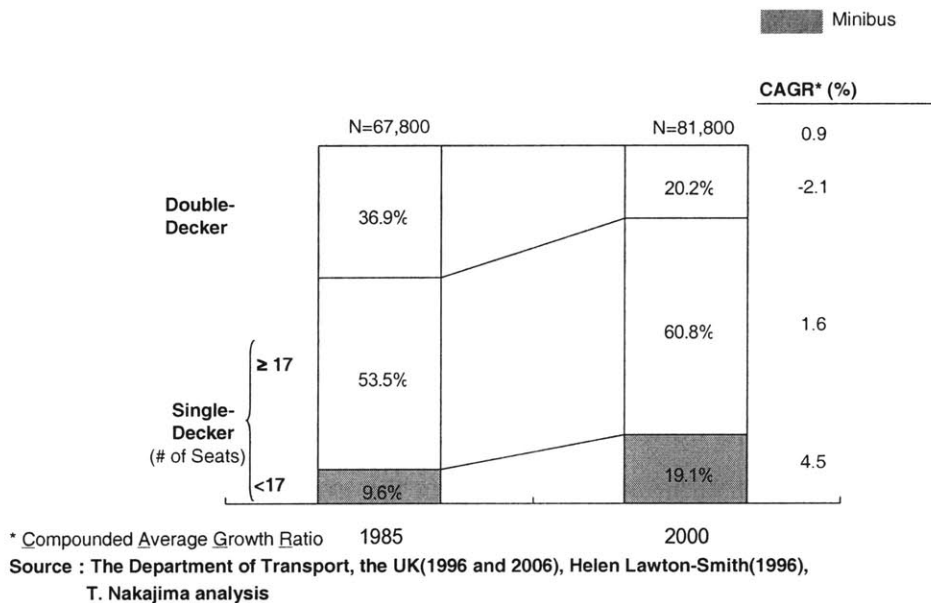
Figure 4-7: PASSENGER GROWTH vs. FARE CHANGE OF LONDON BUS

Even in the UK local bus case, an example of a market-oriented full privatization, the service quality seems to have improved since privatization. As Gomez-Ibanez and Meyer described, before the privatization of UK local bus services, the proponents and opponents had completely different perspectives on the post privatization service quality. Proponents expected private operators to improve service quality which would attract more passenger traffic than before. In contrast, opponents argued that privatization would create local monopolies that were likely to lower service quality with higher real fares (Gomez-Ibanez and Myer, 1990).

Contrary to the speculation of opponents, at least in some respects, the service quality seems to have improved after privatization. For example, the service frequency has been enhanced because of the introduction of mini buses to replace traditional double-deckers (Rye and Wilson, 2002, Gomez-Ibanez and Meyer, 1990) (Figure 4-8). The introduction of minibuses has been one of the most positive changes in local bus services because it benefits passengers due to improved frequency, more direct routes, and higher speed (Gomez-Ibanez and Meyer, 1990). In one city, the ridership increased by 180% with a

40% reduction of operating cost per mile after the introduction of minibuses (Gomez-Ibanez and Meyer, 1990). The service availability has also been enhanced; bus operating kilometers have been increased by 25% due to the introduction of minibuses (Lawton-Smith, 1995).

Figure 4-8: FLEET MIX OF UK LOCAL BUS SERVICES



4.3.2 Discussion and Implications for Yokohama

There is no evidence indicating that privatization, regardless of privatization model, negatively affects service quality of the post-privatization public transit at least in the cases examined above. Rather, all these cases show that service quality has improved after privatization. In some cases, this might be because operators can increase service quality without incurring significant additional costs. For example, punctual operation does not incur significant additional cost because cost required for such punctual operation is already reflected in the existing plan and budget (in many public operations, operators just do not follow the pre-determined standards and schedule). In other words, the real issue in the service quality in many cases is how to motivate operators to follow the minimum standards. In this sense, private operators would have more incentive to achieve the minimum service quality to attract and retain more passengers since these

operators can increase revenue without incurring additional costs. In contrast, public operators which usually obtain subsidies may not care as much about service quality because they do not have to be as concerned with profit as their private counterparts.

It should be also noted that private operators are likely to be better in terms of investment management to introduce innovative service (e.g., minibuses in the London and UK local bus case). As long as increased demand and sufficient returns can be expected, the investment for new service can be justified. However, the capital budgeting for the required investment in the public sector is generally less flexible and may be insufficient to implement capital intensive service innovations such as the introduction of minibuses. In contrast, the private sectors can raise the required funds more easily if the expected return is sufficient.

As the cases of SMRT and London Bus show, the pressure from government through contracts seems to be another important factor for the improved service quality by private operators. TfL records the service quality levels of private operators and uses their performance as a factor in contract renewal. Likewise, the Singapore Government monitors the service performance of private tenders including SMRT and might consider these performance records in contract renewal⁸. In this way, government can make private contractors sensitive to their service performance.

Although it is premature to conclude that privatization always improve service quality positively, it seems reasonable to argue that privatization can at least contribute to service quality enhancement. In other words, the argument that privatization would worsen public transit service quality of public transit is not a strong reason to stop privatization for the municipal transit systems of Yokohama and other municipalities in Japan.

⁸ Specific criteria for a contract renewal of the MRT system do not seem to have determined yet since the 30-year contract with SMRT just begun in 2000.

4.4 Safety

The public is greatly concerned about the safety of public transportation particularly after privatization because opponents frequently argue that a privatized company is likely to sacrifice safety for the sake of cost reduction. Indeed, ensuring the safety of public transit systems sometimes requires huge investment which squeezes short-term profit. In addition, fatal rail accidents such as the Hatfield crash in the UK and the Amagasaki crash in Japan caused by private operators have amplified the public anxiety about the safety. The cause of the Hatfield rail crash was widely attributed to the primitive management of the railway network by the privatized railway network company, Railtrack. Japanese journalists attributed the cause of the Amagasaki rail crash, which killed 106 passengers and a driver, to the excessive profit seeking behavior of JR West. According to journalists, the competition between JR West and private railway companies and the extreme punctuality-orientation of JR West ultimately put unnecessary pressure on the train driver.

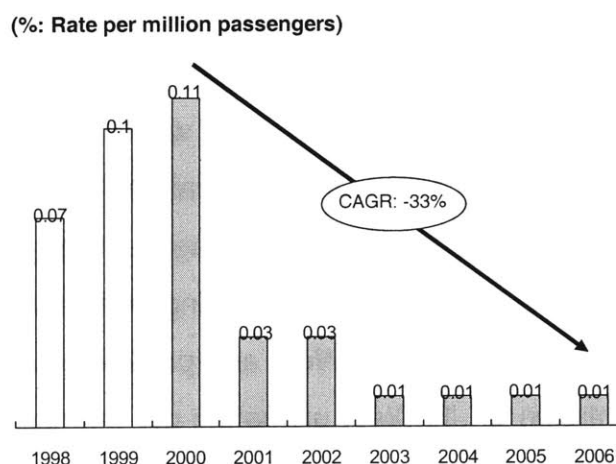
However, it should be examined objectively whether such accidents are directly related to privatization. Although it is difficult to find evidence indicating direct correlation between accidents and privatization, the quantitative evidence about whether the probability of accident increases after privatization should be presented. In this section, such evidence will be explored by analyzing the data from SMRT, an example of the concession model, JRs, and the UK National Rail, examples of the publicly controlled full privatization model. Unfortunately, the cases of the UK local bus services are not examined because safety indicators are not publicly available, to the author's knowledge. Likewise, the safety-related data for London Bus could not be analyzed due to the limited data availability (the only data available is between 2003 and 2006, which is significantly distorted by the terrorist attacks in 2005).

4.4.1 Empirical Analysis

The safety level of SMRT has been considerably improved since the IPO in 2000. Figure 4-9 shows the customer injury rate per million passengers declining from 0.11 per million

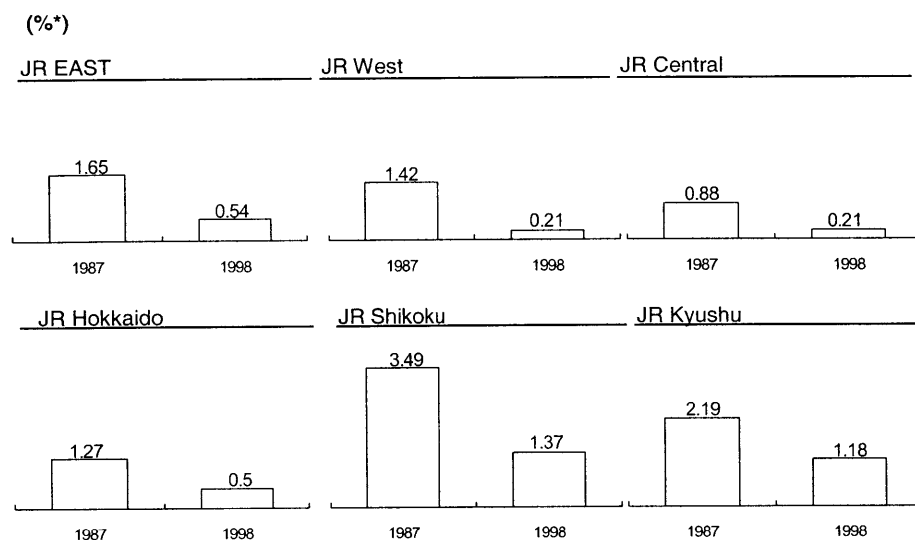
passengers in 2000, the year of the IPO, to 0.03 in 2001 and to 0.01 since 2003. This analysis strongly suggests that the IPO (i.e., privatization) has contributed significantly to the safety level of the MRT system.

Figure 4-9: SMRT CUSTOMER INJURY RATE



Source: SMRT Annual Reports 2003 & 2006, T. Nakajima Analysis

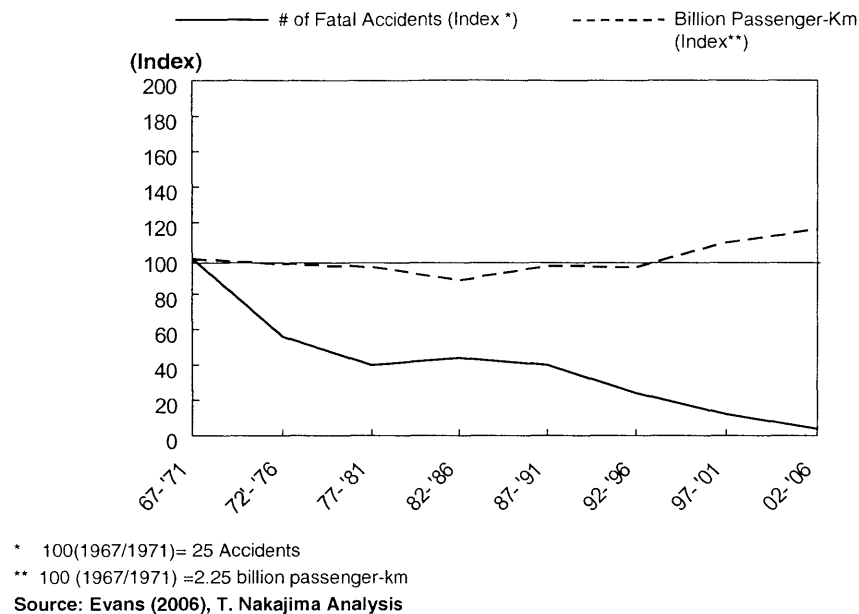
The safety level of all of JRs has also been significantly improved since 1987, the year of full privatization as Figure 4-10 shows. Although the public attributed the cause of the fatal Amagasaki rail crash to looser safety standards after privatization, the long-term data below could nullify such an argument because the data shows the accident rate was reduced by 85% between 1987 and 1998. Likewise, in other JRs, the accident rate was improved considerably (by 68%, 76%, 61%, 61%, and 46% for JR East, JR Central, JR Hokkaido, JR Shikoku, and JR Kyushu, respectively). On average, the rate for all JRs was reduced by 66%.

Figure 4-10: ACCIDENT RATE* OF JRs

* # of all kinds of accidents per million train kilometer
 Source: Mizutani and Nakamura (2000)

Even in the case of UK National Rail whose safety levels are generally believed worsened particularly after privatization, the number of fatal accidents has decreased dramatically according to the statistical research by Evans (2006). Figure 4-11 shows the historical trend of fatal accidents and billion passenger-kilometers between 1967 and 2006. The key point of this figure is that the number of fatal accidents has decreased drastically in spite of the service growth over this period. Even in the period of privatization from 2001 to 2006, the number of fatal accidents decreased modestly. In short, the criticism about safety including the Hatfield crash after privatization of UK National Rail has been exaggerated by journalists and opponents.

Figure 4-11: HISTORICAL TREND OF FATAL ACCIDENTS IN THE UK NATIONAL RAIL



4.4.2 Discussion and Implications for Yokohama

Although the number of cases is limited, the analysis above suggests that safety standards are not necessarily worse in private hands than in public hands. Rather, at least in seven samples in the two cases, the safety standards have been improved dramatically. Such dramatic improvements in safety levels could be attributed to several reasons. First, private companies have a strong incentive to prevent accidents which damage their financial condition and reputation severely. If a fatal accident occurs, a private company may teeter on the brink of bankruptcy in the worst case. Second, government would implicitly or explicitly place strong pressure on privatized entities to improve safety levels because government would be blamed if the number of accidents increases after privatization. Indeed, in many nations, government exerts its strong regulatory power to improve the safety levels of transportation companies. MOLIT in Japan, for example, has the ultimate authority to stop the operations of a transportation company which had a fatal accident and has not improved safety levels. Such potential public intervention might work as a strong deterrent to lax safety standards for private operators.

After all, an accident could happen anytime regardless of the ownership type when an operating company slackens its relentless focus on safety. However, if the City of Yokohama or other municipalities privatize its municipal public transit systems, the city should pay attention to the risk of disastrous accidents such as the Hatfield rail crash. Although the numbers from the UK National Rail shows the safety levels has not been worsened as journalists argue, the Hatfield rail crash still provides a simple lesson that operating railway systems requires well-trained operators and managers with technical expertise in railway systems. As Wolmar revealed, the management team of Railtrack and its appointer (i.e., the central government) dismissed technical expertise and believed that anyone with a good sense of management could manage the railway network (2001). As a result, senior managers did not understand the importance of reports that implied the possibility of accidents and ignored them. In a privatization process, government should recognize the importance of public transportation expertise and make efforts to preserve such expertise in successor entities.

4.5 Abandonment and Dilution of Transit Service Provision

The ultimate goal of a firm is to maximize profit and shareholders' value. Therefore, once a public transportation service is privatized, a privatized entity will focus on this ultimate goal by using resources efficiently and focusing on profitable activities. On the other hand, the ultimate objective of public transportation is to ensure accessibility for the public by providing a comprehensive and high quality transportation network. There is a clear conflict between the activities as a profit seeker and those as a universal transit service provider. Given this conflict, managers of a privatized company might prioritize the profit-maximizing goal and abandon unprofitable but socially necessary routes that ensure universal accessibility for the public or dilute the service provision on these routes. This is one of the major reasons why the public is concerned about privatization.

There is no single definition of socially necessary routes. The City of Yokohama defines a socially necessary route as a route which does not have substitute service within a 10 to

15 minute-walk distance (i.e., approximately an 800-1250 meter radius). The substitute routes include routes of other public transit systems. TfL seems to have a definition similar to Yokohama; TfL sets the standard of providing routes anywhere in London where there are no alternatives within 400 meters (TfL, 2000).

Limited data availability makes it difficult to measure the privatization impact on such socially necessary routes. First, in many cases, data showing abandonment of routes or dilution of service provision in these routes are seldom disclosed systematically. Second, even when such data are disclosed, it is difficult to distinguish between socially necessary routes and simply unprofitable routes. The decision by a privatized company to alter its routes should not be always criticized because it might merely cut an unprofitable and redundant route. In this section, in spite of the difficulties and limitations described above, the impact of privatization on unprofitable but socially necessary routes is examined by using available sources.

4.5.1 Empirical Analysis

The public is concerned that privatization causes the abandonment of unprofitable but socially necessary routes or the dilution of service on such routes. However, similar to the concern about fare increase, such public concerns would lose their validity if a privatized entity cannot determine the service abandonment or dilution for a specific route on its own without a governmental approval. This is particularly true for a concession model by definition because planning a transit network structure and service standards are in public hands in this model. For example, in the case of the MRT system, the Singapore national government (the Land Transport Authority) plans the network structure of the MRT system and a bus system. Therefore, SMRT Corporation could not change the route and frequency of service not only for the MRT system but also for its bus system. Although the data directly showing route abandonment or service dilution are not available, it is reasonable to speculate that socially necessary routes would be rarely abandoned in the London Bus network because TfL directly plans the routes and schedules. Hence, private operators have no influence over the network planning. In

addition, TfL is likely to maintain socially necessary routes even when they are unprofitable because its goal is universal accessibility via public transportation.

Even in the case in which government does not have such strong power in setting routes and service standards as the Singapore national government, privatization does not necessarily trigger service dilution or abandonment. The studies by Mizutani (1999) and Mizutani et al. (2000) show that there is no evidence that privatized JRs have abandoned unprofitable lines. Before privatization, the public were concerned that privatized companies would “ruthlessly” abandon or dilute service provision over routes in rural areas which tend to be unprofitable (Mizutani, 1999). Both studies adopted the same methodology; they chose local unprofitable lines and investigated the change in service availability, service frequency, departure times of the first and last trains, the number of passenger cars, and service quality at stations along the routes. The empirical results in the two studies consistently show that there is no service elimination in the ten years after privatization and that other service measures have also been maintained; these results negated the public concern (Mizutani, 1999, Mizutani and Nakamura, 2000). Mizutani and Nakamura also found that even the three-island JRs which cover disadvantaged regions have also maintained local routes well (2000).

However, it should also be noted that these studies were made before the regulation of route abandonment was removed by the national government in 2000. The national government used to require that a transit operator obtain approval from local governments along the route to be abandoned. The regulation also required the transit operator to ensure substitute service such as bus service for an abandoned route. Therefore, it was difficult for public transit operators to abandon unprofitable routes. In contrast, after deregulation, operators can exit from an unprofitable route basically by notifying local governments of their intent 60 days before exit. Due to this deregulation, the risk that transit operators will eliminate unprofitable but socially necessary routes has increased.

The existing studies about UK local bus privatization show that total operating length of the local bus services has been extended since privatization in 1986. Rye and Nigel reported that the length of operating bus network outside London has increased by 24% between 1986 and 2000 (2002). In addition, local public authorities provide subsidies for unprofitable but socially necessary routes and ensure provision through a competitive tendering process in which the bidder with the lowest price wins. In this way, local authorities minimize the amount of subsidy (Gomez-Ibanez and Meyer, 1990). Furthermore, the Rural Development Commission supports rural bus services which cannot be operated without subsidies (Lawton-Smith, 1995). Combining these facts, the 1986 privatization does not seem to have led to the abandonment of socially necessary routes.

4.5.2 Discussion and Implications for Yokohama

Although the availability of quantitative data is extremely limited, given the analysis presented above, there is no strong evidence supporting the argument that privatization causes the abandonment of unprofitable but socially necessary routes or the dilution of service provision over these routes. The key lesson learned here is that government should continue to take a significant role in the protection of such routes. In all cases examined above, a central or local government continuously commits to the retention of socially necessary routes after privatization. Even in the case of the UK local bus service, an example of market-oriented full privatization, the local governments and the Rural Development Commission intervene in such cases. Privatization refers just to the ownership transfer of public assets, not to the abandonment of the public responsibility of government. In this sense, the validity of the decision made by the Japanese government to deregulate the exit barriers is questionable.

The deregulation by the Japanese national government increases the risk that privatized bus operators in Yokohama and other municipalities would easily abandon unprofitable routes without efforts to improve their performance or provide alternative services. Therefore, municipal governments should find other means to prevent privatized

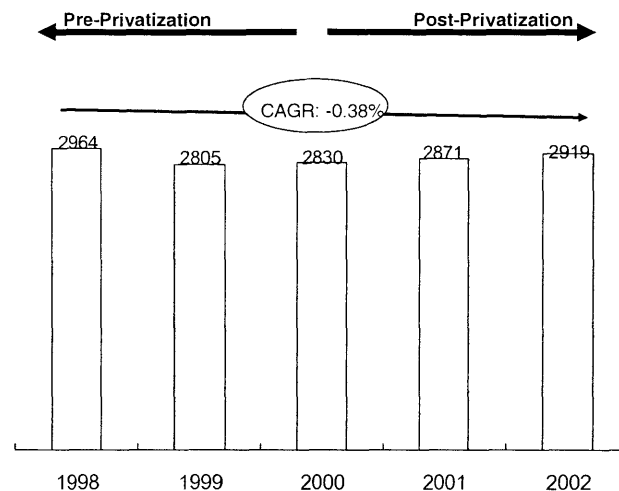
operators from abandoning socially necessary lines. When the municipal governments privatize their transit systems, the municipal governments could regulate such private behavior through direct control, municipal ordinance, or partial public operation after privatization.

4.6 Labor impact of Privatization

Opponents of privatization, in particular labor unions, argue that a privatized company tends to dismiss existing employees and/or cut the wages to obtain cost reduction. However, labor reduction will not always result from privatization because service innovation can expand the market and increase employment (Gomez-Ibanez and Meyer, 1994). In fact, Megginson showed that total employment remains the same or even increases after privatization based on empirical research which examined privatization cases throughout the world (1998). In this section, the employment impact of public transit privatization is examined

4.6.1 Empirical Analysis

Figure 4-12 shows the historical trend of the number of SMRT employees between 1998 and 2002. Because SMRT expanded employment by acquiring other companies and establishing new subsidiaries after 2002, the SMRT employment data after 2002 includes not only the number of employees for existing businesses but also these of new ones. To exclude this influence and focus on the impact of privatization only on the existing transit businesses, this research used the data between 1998 and 2002. As Figure 4-13 suggests, there is no clear change in employment after privatization. Although there might be employment replacement after the IPO, at least the total number of employees did not change significantly. Because the data indicating the wage levels in the MRT system is not available, how the IPO influenced the wage levels for the system cannot be analyzed. However, the labor cost per capita for the entire SMRT in the same period did not change significantly. Therefore, it is plausible that the IPO of SMRT did not have a significant negative impact on employees.

Figure 4-12: NUMBER OF EMPLOYEES OF THE MRT SYSTEM

Source: SMRT Annual Reports 2002, T. Nakajima Analysis

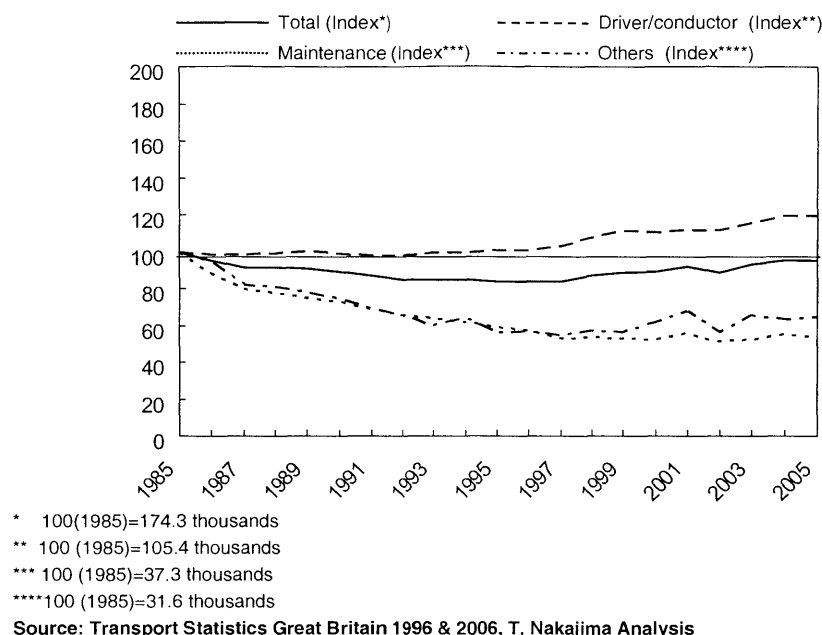
In the JNR case, the net unemployment due to the privatization was insignificant because of the government's strategy, although the central government dismissed a considerable amount of employees in the 1987 privatization. Since 1964, JNR had shown operating losses mainly because of passenger leakage owing to motorization and redundant employees who had been protected by strong labor unions (Mizutani and Nakamura, 2000). In 1985, there were 280,000 employees including 93,000 redundant workers (Fukui, et al., 1994).

Although the management of JNR and the central government attempted to implement several reform plans in order to obtain relief from financial distress "unfair labor practices" augmented by strong labor unions nullified those attempts (Fukui, et al., 1994). The frustrated government then decided to privatize JNR in order to bring sound operation back to the company. In the privatization in 1987, the central government cut almost all redundant workers (i.e., 33% of total employees as of 1985). However, the government also enacted a special law for the reemployment of the redundant workers and prioritized their job transfer into collaborating industries. As a result, there was little unemployment

due to the privatization; only 1047 workers who resisted the privatization to the end finally lost their jobs (Mizutani and Nakamura, 2000). This small unemployment should not be attributed to the cost reduction desire of the government and privatized JRs. In fact, wage levels were increased by 11% to motivate workers to improve efficiency (Mizutani, 1999); the labor cost associated with the 1047 dismissed workers was trivial compared with this wage increase. Thus, it is reasonable to conclude that the privatization of JNR resulted in a positive labor impact, given the government's strategy on redundancy.

The total employment level of the UK local bus services has not changed significantly since 1985. Figure 4-13 indicates the change in the number of employees by function. Since full privatization, the number of drivers has increased by approximately 20%. In comparison, the number of maintenance and other staff (e.g., overhead) have been dramatically reduced. Specifically, the number of maintenance and other staff decreased by 46% and 35%, respectively, in the last 20 years. This reduction was the result of natural attrition and early-retirement programs with large severance payments (Gomez-Ibanez and Meyer, 1990). However, because of the growing number of drivers, total employment has now recovered to the level of 1986.

Given the data described above, it might be true that privatization has created more jobs for drivers. However, it is also true that the shrinkage in the employment of maintenance and other staff can be attributed at least partially to privatization. The competition among bus operators led to industry-wide consolidation and created five mega players (Cowie and Asenova, 1999). This consolidation among players has contributed to the reduction in the unit cost of maintenance and administration, i.e., maintenance and other functional staff. In other words, the unemployment in those areas can be attributed to the increased organizational efficiency through increased scale. Indeed, the statistical test conducted by Cowie and Asenova indicated that private operators emerging after privatization are more technically efficient than public operators largely due to organizational and managerial efficiency (1999).

Figure 4-13: UK Bus Sector Employment

4.6.2 Discussion and Implications for Yokohama

At least in the three cases examined above, there was no clear evidence that privatization causes net unemployment. Although the employees in maintenance and other functions were reduced significantly in the UK local bus service case, the total employment remains at the same level as before the privatization. In the short-term, employment and wage would be negatively damaged by privatization. However, if a public operating entity is less productive than its private counterparts due to excess workers and high wage levels, the rationalization of wage levels or employment can be justified. First, the excessive cost incurred by redundant workers and high wages would be shifted to passengers via higher fares or to tax payers. There is no reason that passengers or tax payers should be sacrificed to protect unproductive workers. Second, such favorable wages are socially unfair for employees in private operating companies because they do similar work to those in a public entity but with lower wages. Third, governmental support for the high cost structure of public operators places private operating companies at a competitive disadvantage because, unlike public operators, their labor cost is not covered by subsidies. In the long-term, the private efforts to improve service quality or

introduce innovative service are more likely to attract more customers which often results in an increase in employment (Gomez-Ibanez and Meyer, 1993) and wage levels.

To minimize the unemployment and associated social concern caused by privatization, however, the City of Yokohama or other municipal governments in Japan should take measures such as the facilitation of job transfer as in the case of JNR privatization. A government may relocate the redundant workers in a privatized company to other positions in government. Indeed, the Ad-hoc Committee of Public Transportation in the City of Yokohama noted that the city should absorb excess employees if it privatized its transit systems.

Yokohama and other Japanese municipalities should allow a privatized company to reduce the wages of their public transit workers to the level of private counterparts. As presented in the previous chapter, the wages of municipal transit workers are 20% higher than those of its private counterparts. After all, given the fact that there are many private operators who perform better than the Yokohama Transportation Bureau, there is no rationale to spoil only public workers.

4.7 Concluding remarks

Opponents of the privatization of public transportation frequently argue that privatization damages social equity and welfare. Opponents also believe that privatized operators tend to prioritize shareholders' value maximization through cost reduction and profit maximization and sacrifice the public interest. However, the analysis based on the actual privatization cases in developed nations above shows no strong evidence supporting such arguments, although this does not mean government does not have to recognize these concerns in their privatization decisions. Rather, the analysis above suggests that whether the public concerns become real depends not on privatization itself but on the degree of deregulation; the less government retains its control over privatized assets, the more social risks potentially caused by privatization increases.

Therefore, the real issue to be resolved in order to protect the public interest is how a privatizing government retains its control over a privatized entity and minimizes the risk that a privatized entity behaves contrary to the public interest. Government should actively intervene in public transportation even after privatization and mediate the internal conflict of interests between the goals of a profit-seeking company and that of a public transportation provider. In this sense, the market-oriented full privatization model observed in the UK local bus service is the least desirable option among the four managerial options identified in Ch.2. The publicly-owned model also does not seem ideal because service quality and safety level in examined cases improved modestly after privatization although factors other than privatization itself might have contributed to these improvements. As the cases examined above show, public transit systems can perform better post-privatization from the social perspective. At least for Yokohama and other municipalities in Japan, a concession model or a publicly-controlled privatization model are more promising with respect to the public concerns discussed above.

Chapter 5: Financial Valuation of Privatization

This chapter evaluates the financial impact of privatization of municipally-owned transportation systems in Yokohama. For the valuation of the impact, the perpetuity valuation method commonly used in the private sector is applied. In addition to the value of the public ownership model (i.e. the status-quo), the value of the two models selected based on the consideration of social risks in the previous chapter, a concession model and a publicly-controlled full privatization, is examined. This chapter first reviews existing studies on the financial impact of privatization and discusses their limitations. Then, a new approach is suggested. Next, the methodology and data applied in this chapter are explained in detail. Applying the methodology, the financial value resulting from each model is presented. Finally, this chapter recommends the model which has the largest financial impact and minimizes social risks for Yokohama.

5.1 Financial impact of privatization

As described in Chapter 3, the privatization argument in Yokohama between the Ad-hoc Committee and the Yokohama Transportation Bureau does not fully address either the financial impact or the social impact from the perspective of the city and its citizens. The decision whether the city should privatize its public transit systems requires a robust analysis indicating how much financial value would be created (or lost) from privatization.

5.1.1 Prior research and its limitations

While many prior studies address the financial or operating impact of privatization, they are rarely holistic and fail to take the perspective of a privatizing government or its citizens. First, research on the financial impact of privatization tends to focus on the financial improvement for a privatized company. Although privatization should influence the public welfare because the assets of citizens are partially or wholly transferred to private hands, most studies do not examine the total financial impact on a privatizing city but solely on the financial improvement of a privatized company. Second, these studies

also tend to focus on the impact in terms of specific individual metrics (e.g., sales increase per capita and profitability) and rarely measure the total financial value created through privatization.

Meggison (1998) showed that most asset-sale privatizations around the world have been financially successful. Meggison (1998) and Meggison/D'Souza (1999) present evidence that sales, profitability, cost efficiency, and other performance metrics improved after privatization in many cases. Meggison and D'Souza show, for example, that profitability increased by between 8.6% and 12.6% in 71% of 85 privatization cases throughout the world and that sales per capita and income per capita increased by 79% and 76%, respectively, after privatization (1999). Similarly, Meggison et al. (2001) show that profitability, real sales (sales excluding subsidies), and operating efficiency improved significantly (statistically) after privatization, using 118 cases between 1961 and 1995 around the world. Indeed, these studies show that privatization improves the financial condition of a privatized organization in terms of the specific metrics examined. However, these studies do not present how much total financial value is created or lost for a government and, ultimately, its citizens. A government cannot judge whether privatization is financially successful by looking only at separate individual metrics.

Particularly for studies of full privatization, some researchers attempt to examine key factors affecting the trade price of a public company or asset. However, none of them explain how practitioners can incorporate those factors into a real valuation or illustrate how the value for a government and its citizens is determined practically. Lopez-De-Silanes (1997) and Arin/Okten (2003) attempted to identify determinants of the sales price of public assets in privatization. Lopez-De-Silanes argues that the following determinants are particularly important: financial performance prior to privatization, macroeconomic conditions, a selling government's commitment to regulation against new entries, and speedy implementation of privatization (1997). Likewise, Arin and Okten identified similar determinants by examining 68 privatization cases in Turkey (2003). However, most of the determinants the two studies identified are *ex post facto* factors

which are known only after privatization and so can not be incorporated explicitly in an actual valuation process before privatization.

5.1.2 Approach of this research

Because public assets ultimately belong to citizens (i.e., tax payers), the value or impact created by privatization should be examined from their perspective. Once these assets are sold to private investors, the financial improvement of a privatized company ultimately does not matter because assets no longer belong to the selling municipality and its citizens. The real concern of the public is whether and how privatization itself can contribute to the enhancement of the municipal welfare.

Therefore, this research attempts to quantify total financial value of privatization from the perspective of a selling city (and ultimately its citizens) by using the perpetuity valuation method commonly used among financial practitioners including the following items:

- Impact on tax revenue: Once a public entity is privatized, the entity is treated as a private entry and required to pay corporate income tax. From a privatizing city's perspective, the increase in the tax means municipal revenue enhancement.
- Impact on subsidies: the subsidies for public transportation are reduced after privatization due to the improved performance of a privatized entity. Because a reduction of subsidies means an increase in municipal budgets, impact of privatization on subsidy levels should be incorporated.
- Impact on debt obligation: interest payments and residual debt levels of a government would be influenced by privatization. For example, the sales proceeds from investors who purchase public assets can be used to repay municipal debt, and if the residual debt is reduced, the present value of interest payment is also reduced. In this way, privatization might help a government reduce financial obligation for future generations.
- Impact on labor cost of a privatizing municipality: if a government absorbs the labor laid off due to privatization, the labor cost for government would be increased. Thus,

such shifted labor cost to a government and its citizens should be reflected in the financial valuation of privatization.

By reflecting the impact of these items, not just the impact on the privatized entity itself, this thesis quantifies the citizen's equity value which is created by privatization for a city and its citizens. The citizens' equity value refers to the financial value available for increasing municipal welfare. If this value is positive, the city can invest in other investment opportunities to enhance the municipal welfare for its citizens as long as government reallocates the financial value appropriately and effectively. In contrast, a negative citizens' equity value means not only that the tax collected from citizens is wasted but also that the financial burden for future generations is expanded. Therefore, the city should maximize the citizens' equity value and make every effort to keep this value positive.

5.2 Methodology

5.2.1 Valuation method- Perpetuity based valuation

There are three main valuation methods commonly used by practitioners in determining the financial value of an asset: Discounted Cash Flow (DCF) method, Perpetuity Valuation, and Relative Valuation. The DCF and perpetuity valuation methods are similar because in both methods, the predicted future Free Cash Flow (FCF) is discounted by a discount rate which reflects a specific risk for a given business. However, there is a difference in FCF projection between the two methods. The perpetuity valuation method assumes that financial improvement in the current year (Year 0) is reflected in Free Cash Flow (FCF), which belongs to both debt holders and owner(s) of assets (5-1), in the next year (Year 1) and will last forever(5-2). This assumption is appropriate particularly when an examined asset generates relatively stable FCF almost eternally. In contrast, in the DCF method, the FCF in a certain period usually from 5 to 10 years should be projected and discounted by a certain discount rate, and the terminal value which is the present value of the last projected year is added to the sum of the present values in the projected period. The DCF method is used when the level of FCF is expected to change significantly over the projected period. In the Relative Valuation Method, the financial

value of an asset is calculated based on financial multiples of comparable companies. For example, if the EBITDA multiple (Firm Value⁹/ EBITDA) of comparable companies is 3 on average, the firm value of the examined firm is obtained by multiplying its EBITDA by 3. This relative valuation method is employed particularly when an examined company is not publicly listed (therefore, no share data is available) and when back-of-the-envelope is sufficient.

Among the three methods, this research employs the perpetuity valuation method for the following reasons. First, it can be assumed that public transit businesses particularly in Japan can generate relatively stable FCF over time. Second, the primary purpose of valuation analysis in this research, which is the comparison of financial value among the examined options, does not require unnecessarily complicated procedures as required in the DCF method (a certain methodology works neutrally for all options). Third, however, because the value of each option should be simulated and examined rigorously, the relative valuation method cannot meet this requirement. Finally, although the PV method is mainly used for the valuation of a stock-listed company, this method is still applicable to the public sector as long as assets generate a certain cash flow, the income statement and the balance sheet are available¹⁰, and comparable listed companies exist. However, note that this eternal FCF assumption is the largest limitation of the perpetuity method because there is risk of overestimating, or underestimating, the financial value of given assets, although this method avoids the complicated process of making five or ten-year cash flow projections.

$$FCF = EBIT(1 - t) + \text{Depreciation} - \text{Change in W.C.} - \text{CAPEX} \quad (5-1)$$

Where, EBIT : Earnings Before Interest and Tax

t : Corporate tax rate

W.C. : Working Capital

CAPEX : Capital Expenditure

⁹ Firm Value = Equity Value (i.e., Market Cap.) + Debt

¹⁰ The City of Yokohama has prepared annual financial statements based on private accounting standards since 2003

$$\text{Perpetual value}_{\text{asset}} = \frac{\text{FCF}_{\text{current}}}{\text{WACC} - g} \quad (5 - 2)$$

Where, FCF : Free Cash Flow

WACC : discounted rate

g : growth rate of free cash flow

5.2.2 Steps in Valuation

In the perpetuity method, the total value of any business or company is the present value (PV) of the expected future FCF. Then, the value of debt and other related value items should be added to, or subtracted from, this business value to obtain citizens' equity value. Although items for this adjustment differ among models examined, the common steps are as follows.

Step 1: Estimate the expected future FCF

Step 2: Determine the discount rate for obtaining the present value of future FCF

Step 3: Calculate business value

Step 4: Adjust debt and other related value items

Step1: Estimate the expected future cash-flow

The first step of estimating the expected future FCF is both most important and difficult because it requires an industry perspective based on business experience and insight. This research relies mainly on empirical data and case studies to make assumptions to supplement such industry-unique knowledge in predicting the cash flow.

Before developing the FCF projection, which is simulated based on the assumptions, the baseline FCF needs to be developed. In developing the baseline FCF for subway and bus systems in Yokohama, this research primarily uses the financial data for 2005 which is the latest available data. However, because the levels of subsidy, capital expenditure (CAPEX), and depreciation since FY 2003 are greatly affected by the construction of the new line, the following adjustments were made to normalize the baseline FCF for the valuation of the Yokohama Municipal Subway Network (YMSN):

- Subsidy: For the baseline FCF, the amount of subsidy in FY 2002 is used instead of FY2005 because the city doubled the amount of subsidy to support the construction of the new line between 2003 and 2005. After completion of the construction, it is assumed that the city will decrease subsidy to the prior level.
- CAPEX: CAPEX in FY 2003 is used instead of 2005 because the CAPEX in FY2002, a year before the beginning of the construction of the new line is unavailable and because CAPEX in FY2003 is the minimum value between FY2003 and FY2005.
- Depreciation: The depreciation in FY2003 is used instead of FY 2005 to be consistent with CAPEX because the level of deprecation expense tends to change according to the level of CAPEX.

Based on the financial data for FY2005 and the three assumptions above, a baseline value of ¥ 6.3 billion FCF is obtained for the subway system (Table 5-1).

For the valuation of the bus system in contrast, no adjustment except for CAPEX is made in the data of FY2005 because of the relatively stable fiscal condition of the system. Average CAPEX between FY2003 and 2004 is used instead of FY2005 because CAPEX in 2005 is distorted by the introduction of low-gas-emission buses. After this adjustment, the baseline FCF of ¥ 376 million is obtained for the Yokohama Municipal Bus System (YMBS) (Table 5-2).

TABLE 5-1: Historical FCFs and Baseline FCF for YMSN

Million JPY		2002	2003	2004	2005	Base
Revenue	Ridership: million JPY	29,923	29,277	29,406	29,998	29,998
	(# of ridership) million	159	162	164	171	171
	(Ave. Fare) :JPY	188	181	179	175	175
	Advertisement	865	840	852	932	932
	Subsidy *	2,913	6,048	5,465	5,772	2,913
Total Revenue		33,701	36,165	35,723	36,702	33,843
Costs	Labor Cost	10,610	10,412	9,704	9,298	9,298
	Other Operating Cost	4,760	4,567	4,207	4,056	4,056
	Operating costs before Depreciation	15,370	14,979	13,911	13,354	13,354
	Depreciation *	13,577	13,024	12,932	13,438	13,024
Total Operating costs		28,947	28,003	26,843	26,792	26,378
Profit	EBIT	4,754	8,162	8,880	9,910	7,465
	EBITDA	18,331	21,186	21,812	23,348	20,489
	Tax	0	0	0	0	0
	Net Income	4,754	8,162	8,880	9,910	7,465
Net Income without subsidy		1,841	2,114	3,415	4,138	4,552
Working Capital	Short-term Asset less cash	10,665	13,902	6,095	5,125	N/A
	Short-term liabilities less debts	21,039	18,133	26,607	23,206	N/A
	Working Capital	-10,374	-4,231	-20,512	-18,081	N/A
Change in Working Capital			6,143	-16,281	2,431	2,431
CAPEX	Capital Expenditure^a		11,752	23,834	32,138	11,752
Free Cash Flow			3,291	14,259	-11,221	6,306

^aDue to the new line construction, the values of subsidy, CAPEX, and depreciation have been distorted significantly since 2003. Therefore, for the baseline, the value of subsidy in 2002, of CAPEX in 2003, and of Depreciation in 2003 are used instead of those in 2005

Source: Annual Financial Report ("Kessan Houkoku-Syo") '03, '04, and '05 (YBT), Jack T. Nakajima

TABLE 5-2: Historical FCFs and Baseline FCF for YMBS

Million JPY		2002	2003	2004	2005	Base
Revenue	Ridership: million JPY	27,838	27,228	25,515	24,336	24,336
	(# of ridership) million	172	170	153	152	152
	(Ave. Fare) : JPY	162	160	166	160	160
	Advertisement	462	463	461	445	445
	Subsidy	3,718	3,312	3,180	2,503	2,503
Total Revenue		32,018	31,003	29,156	27,284	27,284
Costs	Labor Cost	24,552	23,307	21,425	20,081	20,081
	Other Operating Cost	4,119	4,129	3,909	3,801	3,801
	Operating costs before Depreciation	28,671	27,436	25,334	23,882	23,882
	Depreciation	1,868	1,819	1,782	2,293	2,293
Total Operating costs		30,539	29,255	27,116	26,175	26,175
Profit	EBIT	1,479	1,748	2,040	1,109	1,109
	EBITDA	3,347	3,567	3,822	3,402	3,402
	Tax	0	0	0	0	0
	Net Income	1,479	1,748	2,040	1,109	1,109
Net Income without subsidy		-2,239	-1,564	-1,140	-1,394	-1,394
Working Capital	Short-term Asset less cash	1,422	1,877	1,813	1,422	N/A
	Short-term liabilities less debts	6,356	4,209	5,455	3,833	N/A
	Working Capital	-4,934	-2,332	-3,642	-2,411	N/A
Change in Working Capital			2,602	-1,310	1,231	1,231
CAPEX	Capital Expenditure[*]		1,875	1,716	3,079	1,796
Free Cash Flow			-910	3,416	-908	376

* Due to the introduction of low-gas emission buses, the value of CAPEX in FY 2005 is distorted irregularly.

Thus, average CAPEX between 2003 and 2004 is used instead of 2005 for the baseline CAPEX.

Source: Annual Financial Report ("Kessan Houkoku-Syo") '03, '04, and '05 (YBT), Jack T. Nakajima

Step2: Determine the Discount Rate

The next step is to determine the discount rate which is used to calculate the present value of the FCF. Money tomorrow is less valuable than money today because the uncertainty or risk in future conditions decreases the monetary value. Thus, investors demand sufficient returns in order to compensate for the future risk. This expected rate of return for investors is the discount rate which is based on the risk levels investors assume. The risk (i.e., the expected rate of return) depends on the nature of the investment. The risk in investing in the volatile high-tech industry in India is much higher than in public transit in Japan where cash-flow is stable and is not subject to short-term environmental changes.

Although there is significant difference in the sources of finance between the private and public sectors, there is still a rationale to use the same method in evaluating the risk level of a specific public operation and asset. The operation of YMSN should face the same business risks as private railway companies which operate in and around Yokohama (e.g., Keihin Kyuko, Tokyu). Likewise, the operation of the municipal bus network should face the same business risk as private bus operators (e.g., Kana-Chu). If private companies provide service which is similar to that provided by the public sector, it is reasonable to assume that the citizens face the same risk as private investors. Furthermore, because the public service is operated or owned by a private company after privatization, the business value of public assets in privatization should be determined based on the private investors' perspective.

Specifically, in determining the discount rate, the weighted average of capital costs (WACC) is commonly used by practitioners. WACC incorporates the volatility of the macroeconomic conditions and the financial market in the country, the business itself, and the capital structure (i.e., the balance between debt and shareholders' equity) of a given company as indicated in (5-3).

$$r_{capital} = r_{equity} \left(\frac{E}{E + D} \right) + r_{debt} (1 - t) \left(\frac{D}{E + D} \right) \quad (5 - 3)$$

Where, E : Shareholders' Equity

D : Debt

t : corporate tax rate

r_{debt} : interest rate

r_{equity} : rate of return for shareholders' equity

Because municipally-provided subway and bus services are not publicly-listed businesses, the average WACC of comparable companies is applied by assuming that the city's subway operation faces essentially the same risk environment as their private counterparts. For YMSN, the average WACC of JR East, Keihin Kyuko, Sagami Tetsudo,

and Tokyu which operate in and around Yokohama are applied (Table 5-3). For YMBS, the average WACC of Kanachu, Nigata Kotsu, and Shinki Bus, which are operating in relatively similar environments to Yokohama is used (Table 5-4).

TABLE 5-3: WACC ESTIMATION for YMSN

Tax rate		41%		
		JPH	UK	US
Local Risk Free rate		1.93%	5.14%	4.70%
Market Risk Premium		3.99%	4.07%	4.43%

Million JPY																
Company	Ticker	Country	Debt	Equity [*]	D/(D+E)	(1-t)	rd ^{**} (Cost of Debt)	Weighted Cost of Debt	E/(D+E)	Risk Free rate	Mkt. risk premium	Beta ^{***}	re (Cost of Equity)	Weighted Cost of Equity	WACC	
JR East	9020JP	Japan	2,014,228	3,216,780	39%	59%	6.9%	1.6%	61%	1.93%	3.99%	0.40	3.5%	2.2%	3.7%	
Keihin Kyuko	9006JP	Japan	481,581	436,527	52%	59%	1.5%	0.5%	48%	1.93%	3.99%	0.72	4.8%	2.3%	2.8%	
Sagami Tetsudo	9003JP	Japan	343,697	168,853	67%	59%	2.2%	0.9%	33%	1.93%	3.99%	0.34	3.3%	1.1%	2.0%	
Tokyu	9005JP	Japan	1,106,924	884,404	56%	59%	1.8%	0.6%	44%	1.93%	3.99%	0.36	3.4%	1.5%	2.1%	
Average			986,808	1,176,541	53%	59%	3.1%	0.9%	47%	1.93%	3.99%	0.46	3.7%	1.8%	2.6%	

* Market Value Base

**Average interest rate for debt: Interest payment / Debt

***Historical Beta obtained from Bloomberg

Source: Nikkei NET, Bloomberg, JP Morgan Research, Annual Report (Kessan Tanshin) for each companies

TABLE 5-4: WACC ESTIMATION for YMBS

Tax rate		41%		
		JPH	UK	US
Local Risk Free rate		1.93%	5.14%	4.70%
Market Risk Premium		3.99%	4.07%	4.43%

Million JPY																
Company	Ticker	Country	Debt	Equity [*]	D/(D+E)	(1-t)	rd ^{**} (Cost of Debt)	Weighted Cost of Debt	E/(D+E)	Risk Free rate	Mkt. risk premium	Beta ^{***}	re (Cost of Equity)	Weighted Cost of Equity	WACC	
Kanachu	9020JP	Japan	74,498	36,980	67%	59%	1.8%	0.7%	33%	1.93%	3.99%	0.34	3.3%	1.1%	1.8%	
Nigata Kotsu	9006JP	Japan	48,529	8,002	86%	59%	2.7%	1.4%	14%	1.93%	3.99%	0.48	3.8%	0.5%	1.9%	
Shinki Bus	9003JP	Japan	5,826	18,749	24%	59%	0.9%	0.1%	76%	1.93%	3.99%	0.03	2.1%	1.6%	1.7%	
Average			42,951	21,210	59%	59%	1.8%	0.7%	41%	1.93%	3.99%	0.28	3.1%	1.1%	1.8%	

* Market Value Base

**Average interest rate for debt: Interest payment / Debt

***Historical Beta obtained from Bloomberg

Source: Nikkei NET, Bloomberg, JP Morgan Research, Annual Report (Kessan Tanshin) for each companies

There are two sources of finance for any business: equity capital (shareholders' equity) and debt (e.g., loans from bank or issued bonds). Because debt holders have collateral and regular cash-flow from the borrowers through interest payments, the expected rate of return (i.e., interest rate) is generally lower than the expected rate of return on equity. The average interest rate and the rate of return on equity of the four comparable companies for the subway system are 3.1% and 1.8%, respectively. The average interest rate and the rate of return on equity of the four comparable companies for the bus system are both 1.8%.

The Capital Asset Pricing Model (CAPM), which is commonly used by investment bankers, is employed to obtain the expected rate of return on shareholders' equity (5-4). For the risk-free rate, the coupon (interest) rate of the 10-year national bond is commonly used by practitioners. Investing in a national bond can be assumed risk-free because a national government is unlikely to default particularly in developed nations. The risk-free rate of Japan is much lower than that of the U.K. or the U.S. (1.93%, 5.14%, and 4.70% for Japan, the U.K., and the U.S. respectively in July 2006)(JP Morgan Research). Macroeconomic factors that influence the value of public assets in privatization (Lopez-De-Silanes, 1997) should be reflected in the risk-free rate for each country and in the market risk premium.

$$r_{equity} = r_f + \beta(r_m - r_f) \quad (5 - 4)$$

Where, r_f : risk - free rate

r_m : capital market risk

$r_m - r_f$: market risk premium

β : covariance between the % change in a given stock and % change in the entire stock market

The market risk premium indicates how much premium investors demand when they move investment from the risk-free assets to risky market securities because the riskier investment is, the higher the rate of return investors demand (Damodaran, 2006). In practice, investors apply the market risk premium which is empirically analyzed by financial data providers because of the complicated process in obtaining the appropriate data by themselves. This research uses 3.99% for Japan, which is estimated by JP Morgan Research.

The last key component of the CAPM model is the beta of assets which is the standardized covariance of a given stock with the entire market portfolio. In simple terms, the beta of assets indicates how sensitive a given stock price is to changes in the overall market (Damodaran, 2005). Measuring the relative movement of a given stock against the entire market allows analysts to estimate the stock-specific risk (i.e., company-unique risk). For example, if the beta of a given stock is exactly one, this stock price follows the exact same pattern as the overall market; there is actually no uniqueness in terms of risk

in such a stock. In practice, the beta can be obtained from a financial data service firm such as the Bloomberg. Given the fact that the subway service provided by the city is not a public company listed on the stock market, the average beta of the comparable companies for the subway and bus systems is applied.

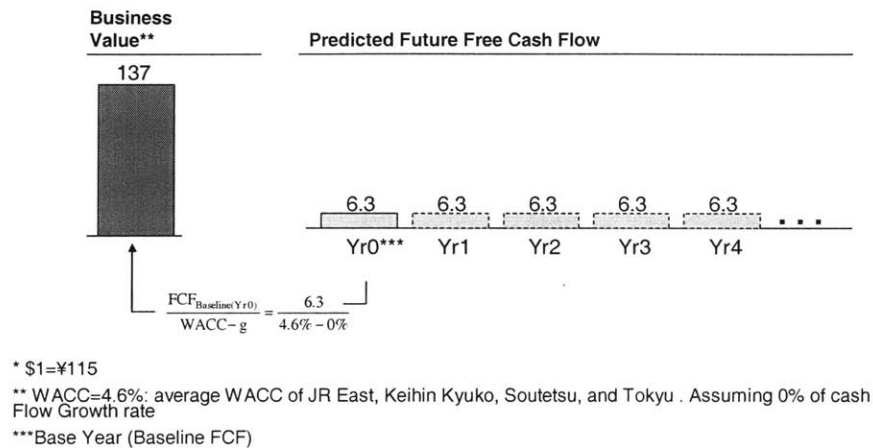
Integrating all composites produced the value of 2.6% and 1.8% for WACC for subway and bus systems, respectively. However, this WACC is perhaps not sustainable over time due to Japan's extremely low risk-free rate which is subject to national fiscal policy that facilitates private investment using debt in order to overcome Japan's long recession. As the national economy recovers, the Central Bank of Japan is likely to make a decision leading to the higher risk-free rate. Therefore, for YMSN, a rate of 4.6% of WACC is applied instead of 2.6% in this research by assuming the risk-free rate in Japan will be soon increased from 1.93% to approximately 5%. Likewise, for YMBS, a rate of 3.8% of WACC is applied instead of 1.8%.

Step 3: Calculate business value

As mentioned above, when measuring the business value of a public transit system, this research adopts the perpetuity valuation method among the three major valuation methods. Specifically, the projected FCF is discounted by the WACC calculated based on the data of comparable companies. For the YMSN baseline case, FCF of ¥6.3 billion is discounted by the WACC of 4.6%, resulting in the business value of ¥137 billion (Figure 5-1).

**Figure5-1 :PERPETUITY VALUE OF THE BASELINE FCF
– EXAMPLE OF YMSN**

(Present Value: Billion JPY*)



Step 4: Adjust debt and other value items

Although the business value indicates the value generated from operations, it is not the value for a municipal government and ultimately for its citizens because the value for the city needs to incorporate the influence of debt and other value factors such as the present value (PV) of municipal corporate tax and subsidy reduction. Because the debt borrowed from banks and from other debt holders in the form of municipal bonds is paid back to the debt holders, it should not be counted as part of the value of the public asset. Thus, the value of debt should be subtracted from the business value. Likewise, other value components which influence the value for the city and its citizens should be subtracted from, or added to, business value. What value components should be incorporated depends on the model of operation and ownership.

5.3 Key Assumptions for Valuation

The valuation analysis is based on the following two premises. First, the value analysis for YMSN focuses on the existing lines and excludes the influence of the new line now under the construction because its impact on financial items is highly uncertain. Second,

to analyze the value of the concession model, this research assumes the fixed-cost contract scheme under which a private contractor focuses on cost minimization (Halvorsen and Wilson, 1995). The rationale behind this premise is that the potential to increase ridership for public transit in Yokohama is limited, given the slow growth rate of the city's population (a CAGR¹¹ of 0.94%). Furthermore, as described in Chapter 3, the urgent issue of Yokohama's transit systems is lower cost efficiency than private railway companies. Thus, it is reasonable to assume a fixed-price contract instead of a cost-plus contract.

In addition to the above two premises, this thesis makes specific assumptions for major financial items. Because there is uncertainty in each financial metric and both business and citizens' equity values are sensitive to certain metrics, three scenarios –base, optimistic, and pessimistic – with different assumptions will be examined in order to reflect such uncertainty and sensitivity. In setting assumptions for the base scenario, the data from actual cases in the previous chapter are applied. However, factors specific to Japan's or Yokohama's public transit systems such as subsidies and CAPEX are based on interviews with government officials of the City of Yokohama and publicly available data and reports provided by the city. In the optimistic scenario, some of the assumptions in the base scenario are relaxed within a reasonable range. In contrast, in the pessimistic scenario, more negative outcome for each financial item is more strictly assumed than in the base scenario; some of the items are even assumed to worsen in this scenario. The assumptions for YMSN and YMBS are shown in Table 5-5 and 5-6, respectively, and discussed in the following section.

¹¹ Compound Average Growth Rate from 1998 to 2005

Table 5-5: SUMMARY OF ASSUMPTIONS-YMSN

	Direction of Change	Public Ownership Model			Concession Model			PFP Model		
		"Pessimistic"	BASE	"Optimistic"	"Pessimistic"	BASE	"Optimistic"	"Pessimistic"	BASE	"Optimistic"
# of Ridership	+	-5%	0%	5%	-5%	0%	5%	5%	10%	15%
Ad Fee	+	-5%	0%	5%	0%	0%	5%	5%	10%	15%
Subsidy	-	0%	0%	0%	0%	0%	0%	100%	100%	100%
# of Labor	-	20%	20%	20%	20%	20%	20%	20%	30%	40%
Ave. Salary	-	5%	5%	5%	5%	5%	5%	5%	5%	5%
Other Operating Cost	-	0%	0%	5%	5%	10%	15%	5%	10%	15%
CAPEX	-	0%	0%	10%	0%	0%	10%	0%	10%	20%
Return for contractor	+	N/A	N/A	N/A	20%	15%	10%	N/A	N/A	N/A

Table 5-6: SUMMARY OF ASSUMPTIONS-YMBS

	Direction of Change	Public Ownership Model			Concession Model			PFP Model		
		"Pessimistic"	BASE	"Optimistic"	"Pessimistic"	BASE	"Optimistic"	"Pessimistic"	BASE	"Optimistic"
# of Ridership	+	-5%	0%	5%	-5%	0%	5%	5%	10%	15%
Ad Fee	+	-5%	0%	5%	-5%	0%	5%	5%	10%	15%
Subsidy	-	70%	80%	90%	70%	80%	90%	90%	90%	90%
# of Labor	-	3%	3%	3%	3%	3%	3%	3%	6%	9%
Ave. Salary	-	5%	5%	5%	5%	5%	5%	5%	10%	15%
Other Operating Cost	-	0%	0%	5%	5%	10%	15%	5%	10%	15%
CAPEX	-	0%	0%	5%	0%	0%	5%	5%	10%	15%
Return for contractor	+	N/A	N/A	N/A	15%	10%	5%	N/A	N/A	N/A

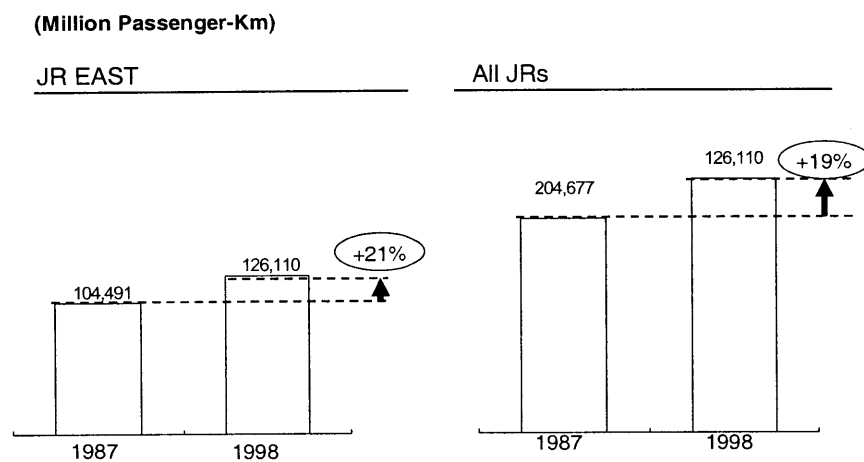
5.3.1 Revenue

Fare levels: In Japan, fare regulation is based on yardstick competition and allows transit operators to increase their fares to the regulatory-determined maximum levels for given performance. However, it is politically and practically difficult for a public authority to increase fares to the maximum levels because of opposition from the public. Even in a publicly-owned full privatization (PFP) model, a private company would hesitate to increase its fare to the regulatory determined maximum levels beyond inflation because of the negative public reaction to the fare increase, as the JR and SMRT cases suggest. Thus, it is plausible to assume that the real fare levels will remain the same in all scenarios for the three models for both YMSN and YMBS.

Number of passengers: In the status-quo, given the limited growth of population in Yokohama, it is reasonable to assume that the ridership levels remain at the current levels on the existing lines in the base scenario. Likewise, in a concession model with a fixed-cost scheme, no increase in the ridership would be expected due to the nature of the scheme; a private contractor does not have a strong incentive to improve the revenue-related items. In contrast, in a PFP model, the number of passengers is

conservatively assumed to increase by 10% in the base scenario due to improved service quality and marketing efforts by a privatized company. In fact, PFP model cases show considerable ridership increase after privatization. The long-term demand growth of JR East between 1987 and 1998 in terms of million passenger-kilometers is 19% (Figure 5-2). Likewise, the ridership for London Bus after privatization has increased by 59% between 1993 and 2005.

Figure 5-2: JRs' DEMAND GROWTH



Source: Ministry of Transports, Mizutani and Nakamura(2000), T Nakajima anaysis

However, because the change in ridership usually influences the business value significantly and the change is highly uncertain (because the passenger growth is influenced greatly by external factors such as population growth, congestion, and car ownership, which transit operators cannot control), its assumption should have a certain latitude in addition to the base scenario. Specifically, the modification of +/- 5% to the base scenario is made for the optimistic and pessimistic scenarios.

Advertising Revenue: Given limited data available for post-privatization advertising revenue changes, this thesis assumes that the advertising revenue is directly correlated

with the number of passengers exposed to promotions. Hence, if ridership increases by 10%, advertising revenue would also increase by 10%. Given this assumption, there is no increase of advertising revenue in the base scenario for the status-quo and concession. In contrast, in the PFP model, advertising revenue is assumed to increase by 10% in the base scenario. Likewise, in the pessimistic and optimistic scenarios, the assumption for advertising revenue follows the exact same pattern as that for the number of passengers.

Subsidies: For YMSN, the subsidy levels in the status-quo are assumed to remain at the baseline (i.e., 2002) because the city continuously needs to pay large interest and CAPEX in the form of subsidies. Even in a concession model, the subsidy levels would remain at the baseline in all scenarios for the same reason. However, in a PFP model, subsidies would be reduced to zero because the privatized company is responsible for the necessary capital expenditure after the acquisition of the network; the city no longer has to support the capital expenditure of the subway network in the form of subsidy.

In contrast, subsidies for YMBS would be reduced by approximately 90 % based on the city's plan that the city will cut all non-required subsidies in the three models. However, in the base scenario for the public ownership and concession models, it is conservatively assumed that the city can cut subsidies only by 80% due to, for example, political resistance or sluggish bureaucratic procedures. In the pessimistic scenario for these models, it is assumed that the city can reduce subsidies by 70%. Given that 10% of the current subsidies are legally determined subsidies, even in a concession or PFP model, the subsidies cannot be cut by 100%. Thus, for the PFP model, a 90% subsidy reduction is assumed in all scenarios (the city has no reason to pay non-required subsidy for a fully private company).

5.3.2 Cost Items

Labor cost: YTB plans to reduce labor costs by cutting both the number of employees and wage levels. Based on the plan, a salary reduction of approximately 5% per

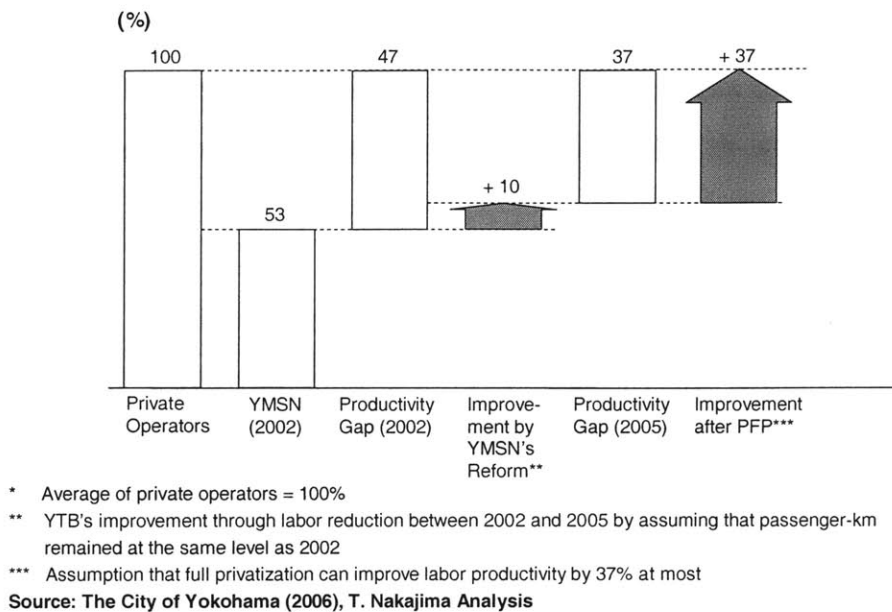
employee is expected in both YMSN and YMBS. YTB also plans to cut the number of employees by 20% and 3 % for YMSN and YMBS between 2005 and 2007¹², respectively, mainly through attrition (retirement). In a concession model, the number of employees and wage levels could be reduced by the same amount as the status-quo because YTB would probably not allow its contractor to implement a more aggressive restructuring program than YTB.

In contrast, this research assumes that a fully privatized operator of YMSN can cut employees by 40%, increasing its labor productivity to the average productivity of private operators in the most optimistic setting (Figure 5-3). In 2002, the labor productivity of YMSN was 47% of the average of three private railway companies operating in and around Yokohama¹³. Because the number of YMSN employees has been reduced by approximately 10% since 2002¹⁴, the productivity gap between YMSN and the average of the three companies is approximately 40% as of 2005, assuming the passenger-kilometers have remained at the same level since 2002. Therefore, this research assumes that the number of employees for YMSN can be reduced by an additional 40% from the 2005 levels in the most optimistic scenario. However, considering the difference between subway systems and surface railway networks (e.g., scale of network), it is conservatively assumed that a privatized operator can cut the number of employees by 30% in the base scenario. In the pessimistic scenario, it is assumed that a privatized operator can cut the number only by 20%.

¹² Based on the materials provided in interviews with government officials on Yokohama in January 18, 2007

¹³ See Figure 3-14

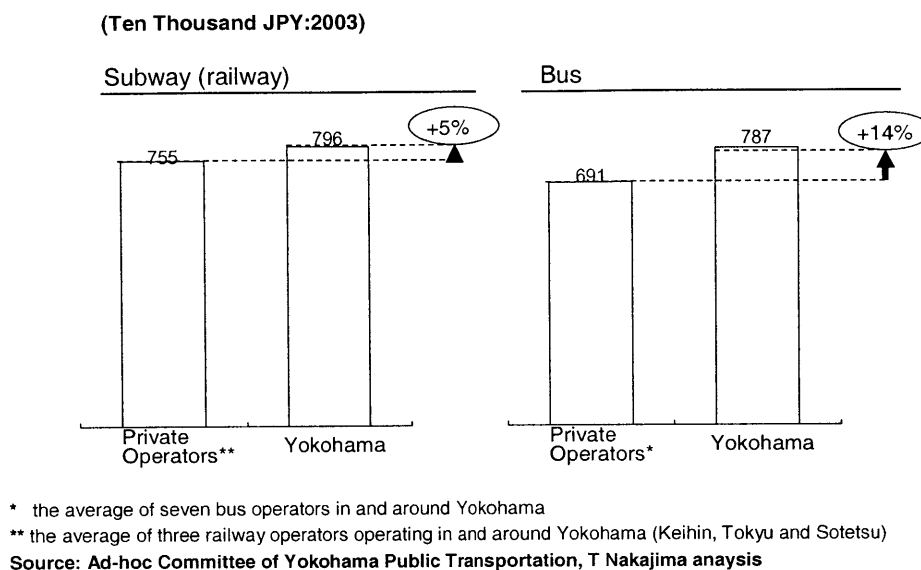
¹⁴ Based on the materials provided at the interview with government officials of the city in January 18, 2007

Figure 5-3: LABOR PRODUCTIVITY GAP ASSUMPTION FOR YMSN

For YMBS, the fully privatized operator can not reduce the number of employees by more than 6% in the base scenario given that this labor reduction would increase the labor productivity of YMBS to the levels of its private counterparts¹⁵. However, in the optimistic case, the privatized operator may try to improve the labor productivity beyond this level by reducing employees more aggressively in the face of conflict with a labor union. In contrast, because of strong resistance from the union, a privatized company may not be able to achieve even the average levels in the pessimistic case.

A fully privatized bus operator could cut wages by 15% in the optimistic scenario because the average salary level of private bus companies operating in and around Yokohama is approximately 15% below that of YTB (Figure 5-4). However, because there might be strong resistance from the labor union, it is conservatively assumed that the privatized entity can achieve a 10% wage reduction in the base scenario.

¹⁵ See Figure 3-13

Figure 5-4: ANNUAL SALARY -PRIVATE OPERATORS VS. YTB

Other operating costs: Other operating costs in the YTB include all operating costs except labor cost and depreciation. They should include, for example, costs for utilities/energy, communication, and marketing. This thesis assumes that those costs would not be reduced in the base scenario for the status-quo. In a PFP model, other operating costs are assumed to be reduced by 10%, which is supported by the case of the JRs (Table 5-1) for both YMSN and YMBS. Unfortunately, comparable data for a concession model could not be obtained because the break-down of operating cost for the comparison between pre and post privatization was not available in relevant cases. However, given the nature of a concession model under a fixed-cost contract assumed in this analysis, there should be a moderate impact on the reduction of other operating costs. Therefore, this research assumes that a private contractor could achieve the same level of cost reduction as a fully privatized company (i.e., 10% reduction) in the base scenario.

Table 5-7: CHANGE IN “OTHER” OPERATING COST* -JRs

(Cost per Km: Thousand JPY)

	1987	1991	% Change
Repair	82	131	60%
Power	33	32	-3%
Other	287	199	-31%
Total	402	362	-10%

* Operating cost except for labor cost, Depreciation, and tax payment

Source: Fukui, et al. (1994), T. Nakajima Analysis

Interest cost: The relation between the amount of interest payment and the residual debt discussed below is inseparable. The total interest payment in the PFP model will be lowest if the sales proceeds of the privatized transit systems are used for debt pay-back. This thesis assumes that all sales proceeds from private investors in the full privatization model would indeed be used for debt pay-back. There is no difference in interest payment between the status-quo and a concession model because the city does not have sales proceeds to be used for debt pay-back.

Corporate Tax: In the status-quo, YTB does not have to pay corporate income tax because it is a public entity. However, in a concession model, a private contractor needs to pay this tax based on the net contracting fee revenue from the city. Likewise, in the PFP model, a privatized company has to meet its corporate income tax obligation. Although the corporate tax rate varies based on the income level, this thesis applies the average corporate tax rate of 41% (15% and 26% for municipal and national corporate tax rates, respectively)¹⁶, in all scenario for the three models.

¹⁶ See <http://www.city.yokohama.jp/me/gyousei/citytax/shizei/houjin.html> for Yokohama municipal corporate tax. See also http://www.nomura.co.jp/terms/japan/si/jikko_zei.html for effective corporate tax rate in Japan.

5.3.3 Balance Sheet Items

Capital Expenditure (CAPEX): This research assumes that in the status-quo, YTB keeps total CAPEX at the baseline level for YMSN and YMBS in both base and pessimistic scenario because government tends to be less sensitive to CAPEX. Indeed, the public sector in Japan is frequently criticized as being less sensitive to CAPEX reduction and tends to waste public funds by paying unnecessary costs. However, in the optimistic case, even government may be able to reduce CAPEX slightly (say 5%). Likewise, in the concession model, the baseline level would be maintained by YTB because a private contractor by definition cannot change the CAPEX levels. However, in the PFP model, it is reasonable to assume that a privatized company would focus on maintenance CAPEX in order to minimize the cash outflow and maximize business value by, for example, introducing a more competitive purchasing process or other CAPEX reduction methods which are commonly used in the private sector. Therefore, this research assumes a 10 % reduction of CAPEX for both YMSN and YMBS in the base scenario. In the optimistic case, a full privatized company may reduce CAPEX more aggressively (say an additional 5%). In contrast, in the pessimistic scenario, a privatized company may not be able to achieve even the 10% reduction. Because CAPEX of an infrastructure business usually has a huge impact on the entire fiscal condition of the business, this assumption should cover a reasonable range.

Debt: In the status-quo, YTB and the city pay back the residual debt either by issuing additional municipal bonds or using positive operating cash flow on the current pay-back schedule, although it takes a long time to liquidate all debt. In the concession model, the situation does not differ fundamentally from the status-quo although the amount of interest payment can be reduced due to the increased operating cash flow, which can be used for accelerated debt pay-back. In contrast, in the PFP model, all or a considerable portion of the residual debt could be paid back at once by using the sales proceeds from investors who acquire the public transit system.

5.4 Valuation for Yokohama Municipal Subway Network (YMSN)

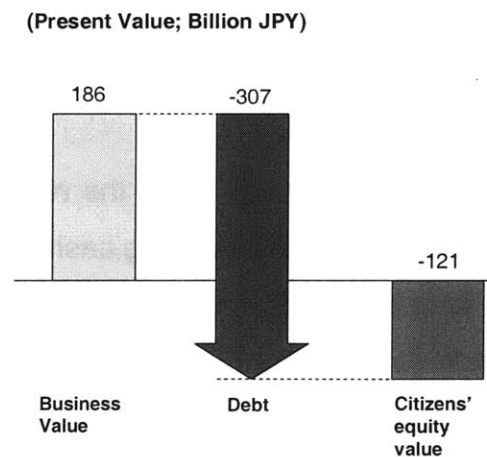
Based on the above assumptions, the value of each model for YMSN is quantified and analyzed in this section. First, the value for each model is quantified. In each model, after the value in the base scenario is calculated in detail in order to demonstrate how to obtain the citizens' equity value, the results for the optimistic and pessimistic scenario are presented. Finally, the difference in the business and citizens' equity value among the three models and the three scenarios are analyzed and discussed.

5.4.1 Value of Status-quo (Public Ownership Model)

Results of Base Scenario:

Given the assumptions above, the business value of the status-quo in the base scenario is approximately ¥ 186 billion, the sum of the present value of annual FCF (¥ 8.5 billion per year), discounted by 4.6% of WACC. After ¥307 billion of the predicted residual debt as of 2007 is subtracted from this business value, the citizens' equity value is - ¥ 122 billion (Figure 5-5).

Figure 5-5 :VALUE OF THE PUBLIC OWNERSHIP MODEL*– YMSN



* Base Scenario

Results of Optimistic and Pessimistic Scenarios:

To see the range of value with different assumptions, both business and citizens' equity values in two additional scenarios are examined. The outcome of this scenario analysis suggests that citizens' equity value for the public ownership model is still negative (- ¥60 billion) even in the optimistic scenario with more relaxed assumptions, although the business value is improved modestly to ¥250 billion (Table 5-8). This result implies that the debt accumulated in YMSN is beyond the solvency capacity of YTB alone without continuing financial assistance from the city in all cases.

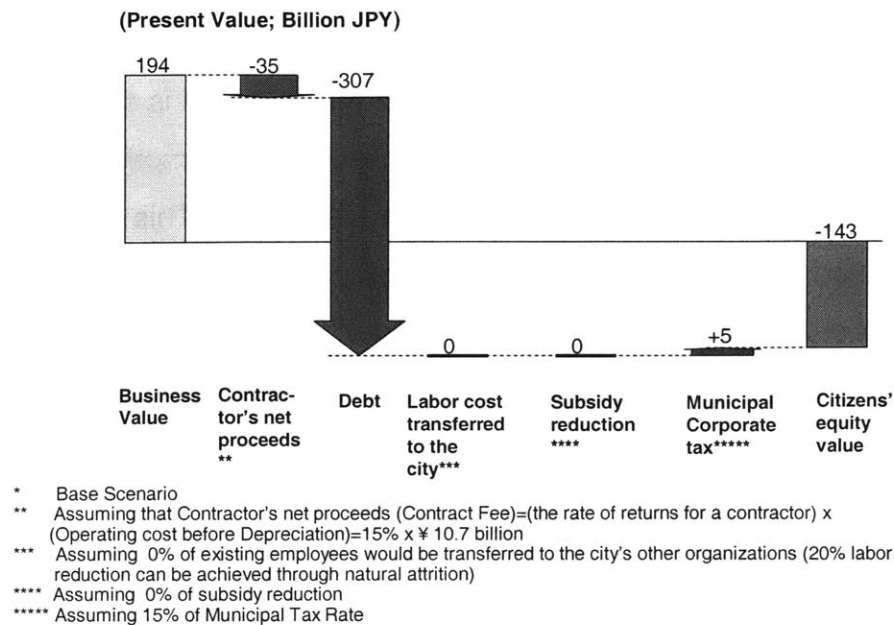
Table 5-8: VALUE BY SCENARIO- PUBLIC OWNERSHIP(YMSN)

(million JPY)	Scenario		
	"Pessimistic"	BASE	"Optimistic"
Business Value	151,979	185,598	249,174
Citizens' Equity	-155,125	-121,506	-57,930

5.4.2 Concession Model

Result of Base Scenario

The business value of this model is ¥ 194 billion with 4.6% of WACC and approximately ¥ 9 billion of annual FCF in the base scenario. Based on this business value, the citizen's equity value of the concession model, - ¥143 billion, can be obtained by making the adjustments shown in Figure 5-6.

Figure 5-6 :VALUE OF THE CONCESSION MODEL* – YMSN

The net contracting fee (net proceeds for a contractor after all costs are subtracted) as well as ¥307 billion of debt should be subtracted from the business value. For simplicity, this research assumes that a private contractor would seek at least the same level of profitability as in their current operations in the most optimistic scenario (for the city). Average operating profitability of the four railway companies operating in and around Yokohama is 10 % in 2005. However, a private contractor is likely to seek greater profitability in return for the risk of operating beyond its current operations. Without additional returns, there is no reason to take such risk and spend its precious corporate resources. Thus, for the base scenario, this research assumes 15% as the required return for a contractor. Given that annual operating expenses except for depreciation are approximately ¥10 billion in the base scenario for the concession model, the annual net contracting fee is ¥ 1.6 billion. As a result, the present value of this fee is ¥ 35 billion with WACC of 4.6% (the city pays this amount of net annual contracting fee eternally regardless of who the contractor is).

Next, the PV of labor cost shifted to the city should be subtracted. Because the city

announced that it would absorb all unemployed public workers except for natural attrition¹⁷ (retirement), the additional labor cost transferred from a privatized operation accrues to the city's account. However, given the above assumption on labor cost, there is no more unemployment beyond natural attrition in a concession model than in the status-quo; the PV of labor cost shifted to the city due to a concession model is therefore zero.

Although the PV of subsidy reduction should be added back into the business value, the PV of subsidy reduction due to privatization is zero in this case, given the above assumptions. Thus, only the PV of the municipal corporate tax revenue should be added back. In the concession model, the municipal corporate tax rate (15%) is charged for the ¥ 1.6 billion of annual net contracting fee, and approximately ¥ 5 billion would be counted as the PV of the municipal tax revenue. Finally, the citizens' equity value of - ¥143 billion is obtained in the base scenario.

Results in the Optimistic and Pessimistic Scenarios:

Even in the optimistic scenario, similar to the public ownership model (status-quo), the citizens' equity value is still negative (- ¥69 billion) (Table 5-9). The slight financial improvement made by a contractor does not help the city solve the financial distress caused by excessive debt for YMSN in any scenario, as discussed later.

Table 5-9: VALUE BY SCENARIO- CONCESSION (YMSN)

(million JPY)	Scenario		
	"Pessimistic"	BASE	"Optimistic"
Business Value	157,400	194,416	257,992
Citizens' Equity	-190,059	-142,393	-68,540

5.4.3 Publicly-controlled Full Privatization (PFP)

Result in Base Scenario:

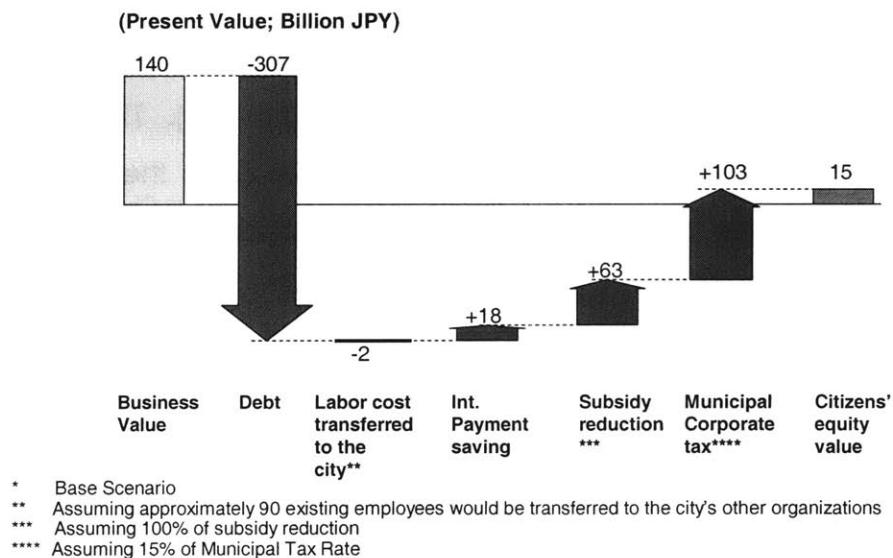
Based on the above assumptions, the business value in a publicly-controlled full

¹⁷ The city has adopted 60 year old retirement system

privatization (PFP) model would be approximately ¥ 140 billion in the base scenario. By adjusting this business value through the following process, approximately ¥ 15 billion of the citizens' equity value is obtained (Figure 5-7).

From the business value, ¥307 billion of debt should first be subtracted. Likewise, approximately ¥ 2 billion should be subtracted as the PV of labor cost transferred to the city. For estimating the impact of the labor transferred from a privatized company to the city, the same assumption used in the valuation of the concession model is applied. To minimize the labor cost shifted to the city, this research assumes that the city would allow the private contractor to transfer laid-off employees based on seniority. In addition to the employees who retire through natural attrition, the lay-off of 88 workers who are supposed to work at most for 4 years is assumed¹⁸, resulting in the PV¹⁹ of the labor cost shifted to the city is approximately ¥ 2 billion.

Figure 5-7 :VALUE OF THE PFP MODEL* – YMSN



The city can save approximately ¥ 18 billion of interest payment because the city can pay

¹⁸ Estimate based on the material provided in interviews with Yokohama city officials in Jan. 18, 2007

¹⁹ This is not perpetuity-based PV because all the transferred workers will be retired in 4 years with an attrition rate of 20%; the city thus does not have to pay them salary forever.

back ¥ 140 billion of the ¥307 billion estimated total residual debt (as of 2007E) at once, using the paid-in cash from a private purchaser. In the status-quo case, it would take 7 years to pay back this amount of debt with the assumption that the city annually pays back ¥30 billion with a 4.78 % interest rate and the same amount of principal. Note that the discount rate used to calculate the PV of interest payment saving is not WACC but a 4.78% interest rate simply because the risk associated with the debt obligation is unique to the city, not to the business itself after the privatization.

In addition, the following items should be added to the business value. Approximately ¥ 63 billion of subsidy reduction impact should be added, because the city would no longer support YMSN through subsidy after full privatization. Finally, the PV of the corporate tax revenue should also be added. Given ¥ 5 billion of municipal corporate tax revenue is expected annually, the PV of this tax revenue is approximately ¥ 103 billion. Finally, ¥15 billion of the citizens' equity value is obtained in the base scenario.

Results in Optimistic and Pessimistic Scenarios:

In the optimistic scenario, the citizens' equity value is improved significantly (¥ 111 billion) due to the improvement in business value, the municipal tax revenue increase, and interest payment reduction (Table 5-10). In particular, the additional 5% increase in ridership greatly contributes to the increase in business value because of its sensitivity to the value. However, in the pessimistic scenario, even in this model, the citizens' equity value becomes negative (- ¥77 billion), although this value is still higher than the citizens' equity value generated by either the public ownership or concession model in the base scenario.

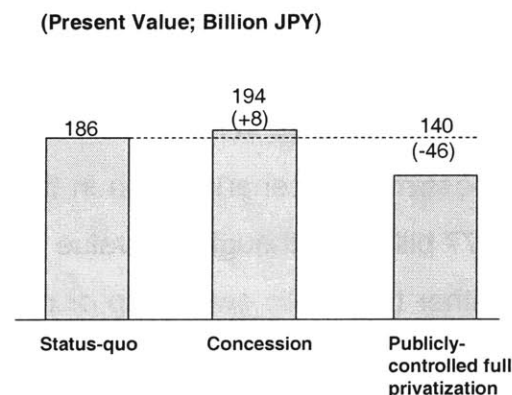
Table 5-10: VALUE BY SCENARIO- PFP (YMSN)

(million JPY)	Scenario		
	"Pessimistic"	BASE	"Optimistic"
Business Value	80,768	140,396	200,024
Citizens' Equity	-77,120	14,858	111,149

5.4.4 Analysis

The valuation for YMSN indicates that the business value of the PFP model is smaller than those of the status-quo and the concession model (Figure 5-8) in the three scenarios. This somewhat counterintuitive result can be attributed to the following reasons. First, while the business value of the status-quo and the concession model includes the subsidies (i.e., the value transferred from the city), the business value of a PFP model does not. Second, the other two models have a tax advantage over the PFP model simply because a public organization is exempt from corporate tax. Although a private contractor needs to pay tax on its net contract proceeds, government itself does not have to pay it. In Japan, approximately 41% of net income of a profit-seeking company is paid as corporate tax to the central and local governments. Therefore, even though a privatized operator could improve financial aspects compared with the YTB, the enhanced value of such improvements would be offset by the value lost via newly charged corporate tax in the YMSN case.

Figure 5-8 :BUSINESS VALUE OF THE THREE MODELS* – YMSN

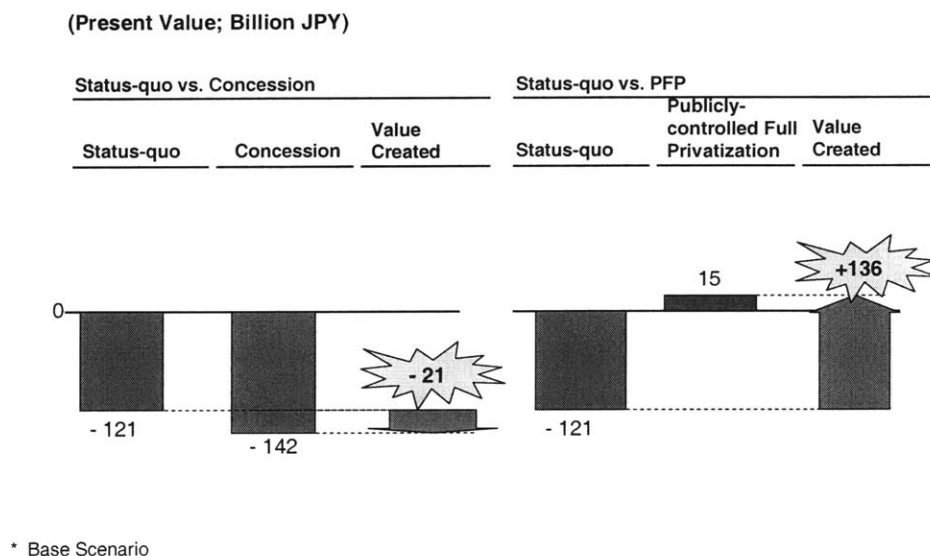


* Base Scenario

In terms of the citizens' equity value, the PFP model is the best option in all scenarios; only a PFP model has a positive citizens' equity value in both base and optimistic

scenarios. In the base scenario, an additionally ¥ 136 billion could be generated by switching from the public ownership model to the PFP model (Figure 5-9). Even comparing the PFP model in the pessimistic scenario with the other two models in the base scenario, the PFP model generates the largest citizens' equity value (Figure 5-10).

Figure 5-9 : CITIZENS' EQUITY VALUE OF THE THREE MODELS – YMSN

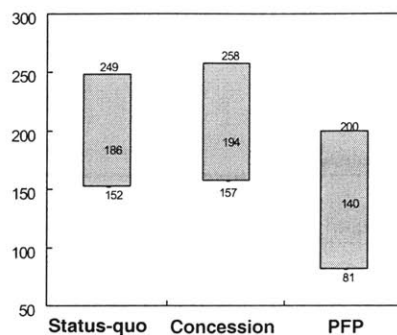


In contrast, by switching from the status-quo to the concession model, the citizens' equity value is worsened in any scenarios examined in this research. This is mainly because a significant portion of value created under this model will leak to a private contractor through the net contractor's proceeds. The additional business value (¥ 8 billion in the base scenario) created by switching from the status-quo to this model is smaller than the value leaked (¥ 35 billion in the base scenario) to a private contractor. To make matters worse, the city cannot expect as large a subsidy reduction and corporate tax revenue in a concession model as in a PFP model. In sum, from city's and citizens' perspective, there is no financial rationale to switch to the concession model from the status-quo.

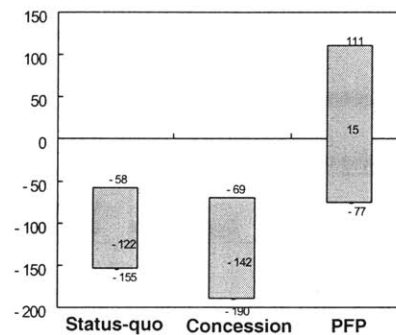
Figure 5-10: VALUE RANGE BETWEEN “OPTIMISTIC” AND “PESSIMISTIC” SCENARIO-YMSN

(Present Value; Billion JPY)

Business Value by Model



Citizens' Equity Value by Model



5.5 Valuation for Yokohama Municipal Bus System (YMBS)

Similar to YMSN, based on the above assumptions, the value of each model for YMBS are quantified and analyzed in this section. First, the value for each model is quantified. In each model, after the value in the base scenario is calculated in detail in order to demonstrate how to obtain the citizens' equity value, the results for the optimistic and pessimistic scenario are presented. Finally, the difference in the business and citizens' equity value among the three models and the three scenarios are analyzed and discussed.

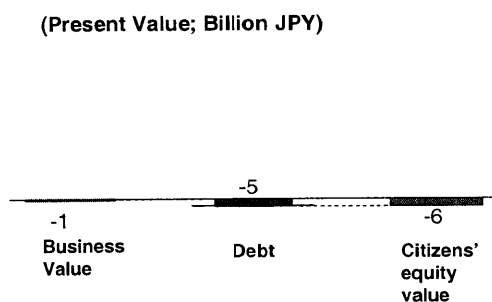
5.5.1 Value of Status-quo (Public Ownership Model)

Result of Base Scenario:

The business value of the status-quo of YMBS is - ¥1.3 billion in the base scenario based on the stated assumptions. From this business value, approximately ¥ 5 billion debt should be subtracted, resulting in the citizens' equity value of - ¥ 6.3 billion (Figure 5-11). The business value becomes negative (before any adjustment) because of the subsidy reduction planned by the city. In other words, the current positive business value under public ownership does not represent the true business value solely from operation; it is

inflated by financial support from the city (and citizens).

Figure 5-11 :VALUE OF THE PUBLIC OWNERSHIP MODEL* – YMBS



* Base Scenario

Results in Optimistic and Pessimistic Scenarios:

In the optimistic scenario, both business and citizens' equity value are improved significantly and become positive (Table 5-11). Given that other key metrics including average salary and the number of employees remain the same as in the base scenario, the 5 % ridership increase assumed in this scenario contributes greatly to this improvement. In the pessimistic scenario where the ridership is assumed to decrease by 5%, both values decrease significantly.

Table 5-11: VALUE BY SCENARIO- PUBLIC OWNERSHIP

	Scenario		
	"Pessimistic"	BASE	"Optimistic"
Business Value	-27,350	-1,330	32,054
Citizens' Equity Value	-32,462	-6,442	26,942

5.5.2 Value of Concession Model

Result of Base Scenario:

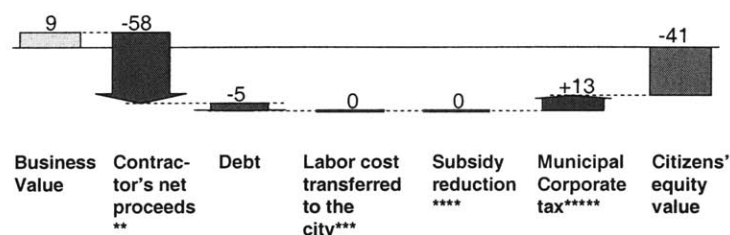
The business value in the concession model is ¥ 9 billion, ¥ 10 billion higher than the status-quo mainly due to the assumed cost reductions. The ¥ 5 billion of debt as well as the PV of the contractor's net proceeds, which is ¥ 58 billion, should be subtracted from the business value (Figure 5-12).

In calculating the contractor's net proceeds, the same logic used for YMSN above is employed. The average operating profitability among the three private bus operators examined is approximately 5%. Thus, in the most optimistic scenario (for the city), it is assumed that a private contractor seeks the same profitability. However, a private contractor is more likely to seek additional return to compensate for its business risk of going beyond its traditional operation. Therefore, this research conservatively assumes a 10% rate of return for a private contractor in the base scenario.

Even with this lower rate of return, the absolute value of the annual net contractor's proceeds is different between YMSN and YMBS simply due to the difference in operating cost (excluding depreciation) between these two systems, ¥11 billion and ¥22 billion, respectively. This is why the present value of the contractor's net proceed in YMBS (¥ 58 billion) is larger than that in YMSN (¥ 35 billion). Because the FCF (¥ 0.33 billion) for YMBS is far below the contractors' annual net proceeds (¥ 3.2 billion), the PV of the proceeds is also much larger than the business value of YMBS. This paradoxical situation does not occur in YMSN because additional FCF generated by a private contractor is far larger than its net proceeds.

Figure 5-12 :VALUE OF THE CONCESSION MODEL* – YMBS

(Present Value; Billion JPY)



* Base Scenario

** Assuming that Contractor's annual net proceeds (Contract Fee)=(the rate of returns for a contractor) x (Operating cost before Depreciation) = 10% x ¥ 21.9 billion

*** Assuming 0% of existing employees would be transferred to the city's other organizations (20% labor reduction can be achieved through natural attrition)

**** Assuming 0% of subsidy reduction

***** Assuming 15% of Municipal Tax Rate

Finally, the following items should be adjusted. The PV of the labor cost shifted to the city is zero, because there is no additional unemployment compared with the status-quo. Similarly, the impact of subsidy reduction due to privatization is zero, given the assumption that YTB would cut subsidies the same amount as in the status-quo (i.e., no additional saving from privatization). Finally, the PV of municipal corporate tax from a private contractor (¥ 13 billion) should be added back to the business value. As a result, the citizens' equity value in this model is - ¥ 41 billion.

Results in Optimistic and Pessimistic Scenarios:

Similar to the scenarios in the public ownership model, any change in ridership affects both business and citizens' equity value greatly, given that business value is not highly sensitive to the change in advertising fee, other operating cost, or CAPEX, all of which are assumed to change in both optimistic and pessimistic scenarios (Table 5-12).

Table 5-12: VALUE BY SCENARIO -CONCESSION(YMBS)

(million JPY)	Senario		
	"Pessimistic"	BASE	"Optimistic"
	-22,348	8,673	42,056

	Senario		
	"Pessimistic"	BASE	"Optimistic"
	-126,399	-70,005	21,947

5.5.3 Value of Publicly-controlled Full Privatization

Result of Base Scenario:

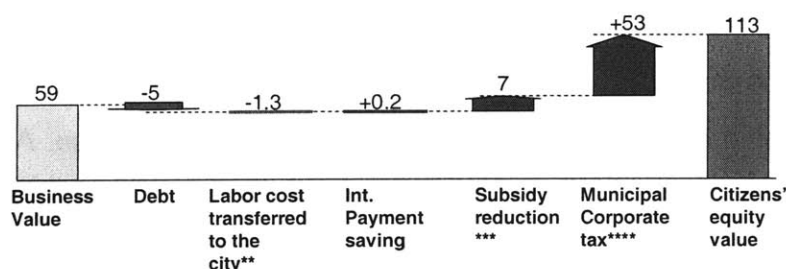
Based on the stated assumptions, a citizens' equity value of approximately ¥ 113 is obtained in a publicly-controlled full privatization (Figure 5-13). The business value of YMBS in this model is ¥ 59 billion. As in the concession model, ¥ 5 billion of debt should be subtracted. In addition, the PV of the labor cost transferred to the city, which is ¥ 1.3 billion, should be subtracted from the business value. In the base scenario of the PFP model, 73 employees are dismissed in addition to the natural attrition of the same number of employees,²⁰ which is assumed in other two models. These dismissed employees are assumed to work for 4 years at most (a 25% annual attrition rate), resulting in ¥ 1.3 billion of the PV if the city accepts these dismissed employees.

Next the following items should be added back. First, ¥ 0.2 billion of the PV of the saved interest payment should be added. Since the estimated residual debt for YMBS in 2007 is only ¥ 5 billion which is much smaller than that for YMSN, the simulation shows that the city could pay back all debt by 2011 if it pays back the current levels of principal payment constantly. This is why the impact of saved interest payment is much smaller in YMBS than for YMSN. Next, given the assumption that subsidies are reduced by 10% in the PFP model compared with the public ownership, the PV of the subsidy reduction due to privatization is ¥ 7 billion. Finally, the PV of the municipal corporate tax revenue from a privatized company should be added. With the same assumptions as for YMSN, the PV of the municipal corporate tax would be ¥ 53 billion.

²⁰ Estimated based on the material provided by government officials at the interview in Jan. 18, 2007

Figure 5-13 :VALUE OF THE PFP MODEL* – YMBS

(Present Value; Billion JPY)



* Base Scenario

** Assuming 15% of existing employees would be transferred to the city's other organizations

*** Assuming 100% of subsidy reduction

**** Assuming 15% of Municipal Tax Rate

Results in Optimistic and Pessimistic Scenarios:

Table 5-13 shows that both business and citizens' equity values of the PFP model are positive even in the pessimistic scenario. In addition to the ridership increase, the key factor contributing to the wide range of value between the pessimistic and optimistic scenario is the combination of the change in the number of employees by 3% and change in average salary by 5%, resulting in 226% change in the business value, *ceteris paribus*.

Table 5-13: VALUE BY SCENARIO -PFP (YMBS)

(million JPY)

Senario		
"Pessimistic"	BASE	"Optimistic"
10,903	58,831	105,824

Senario		
"Pessimistic"	BASE	"Optimistic"
39,696	112,234	182,601

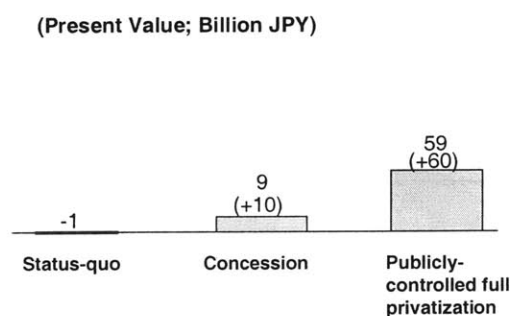
5.5.4 Analysis

There is a significant difference in business value between the PFP model and the other two models (5-14). This difference can be attributed mainly to the difference in labor cost

reduction. In YMBS, labor cost represents 90% of all operating cost. Therefore, the business value is highly sensitive to change in the salary levels and the number of employees. The combination of an additional 3% reduction in the number of employees and 5% decrease in the average salary leads to approximately ¥ 2 billion higher FCF (i.e., ¥52 billion of the PV) than other two models. Although the additional 10% decrease in subsidy aggravates the FCF of the PFP model, the 10% ridership increase assumed only for the PFP model in the base scenario offsets such FCF decrease. Although there is a corporate tax disadvantage in this model, unlike the YMSN case, the FCF after tax generated by this model is much more than the total FCF generated in the other two models.

In all scenarios examined above, the PFP model is the best option financially among the three models in terms of the citizens' equity value. Only the PFP model has a positive citizens' equity value in the base scenario. Even comparing the PFP model in the pessimistic scenario with other two models in the optimistic setting, the citizens' equity value of the PFP model is still the largest (Figure 5-15).

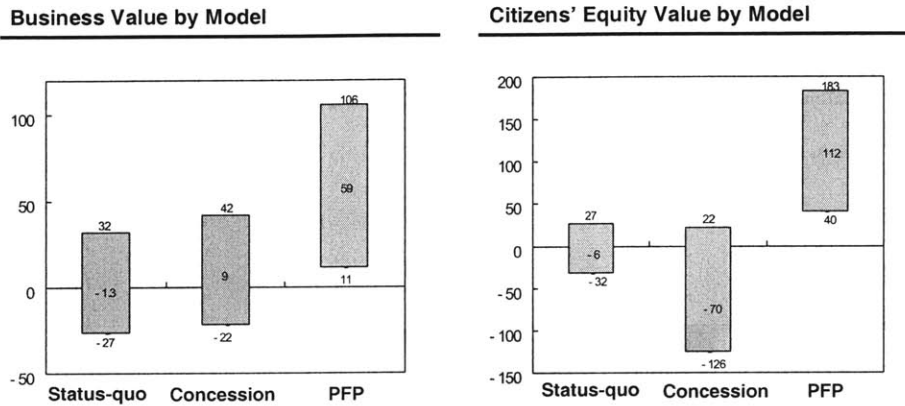
Figure 5-14 :BUSINESS VALUE OF THE THREE MODELS* - YMBS



* Base Scenario

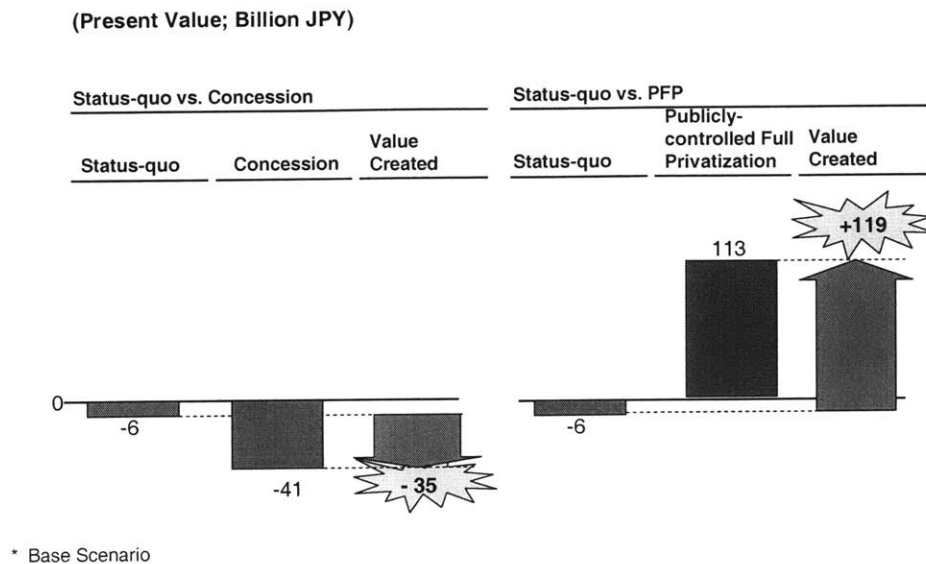
Figure 5-15: VALUE RANGE BETWEEN “OPTIMISTIC” AND “PESSIMISTIC” SCENARIO-YMBS

(Present Value; Billion JPY)



Shifting from the status-quo to a concession model, the city could lose \$ 35 billion (Figure 5-18). Although the FCF (business value) can be enhanced, most value created by this model would be transferred to a private contractor through the contractor's net proceeds. As already discussed, the annual net proceeds (¥ 3.2 billion) paid out to the contractor is far beyond the FCF (¥ 0.33 billion) generated under this model. To make matters worse, the municipal corporate tax revenue from the contractor is not as significant as from a fully privatized entity. In sum, similar to YMSN, there is no financial rationale to apply the concession model in YMBS.

In contrast, the shift from the status-quo to a PFP model would generate an additional ¥ 119 billion for Yokohama. This large impact can be explained by the larger business value of a PFP model due to the improved labor cost, to which business value is highly sensitive. In addition, this considerably improved net income would produce a large municipal corporate tax revenue which cannot be expected in the status-quo.

Figure 5-16 : CITIZENS' EQUITY VALUE OF THE THREE MODELS -YMBS

5.6 Concluding remarks- Integration of social and financial analyses

In other studies of the impacts of privatization, researchers have tended to focus on individual financial metrics for the privatized entity alone. However, as this chapter has discussed, the financial value of privatization should be examined from the perspective of a selling government and ultimately its citizens. The financial impact of privatization should also be measured using a holistic valuation framework rather than individual metrics. This chapter recommends the perpetuity-based valuation method and framework to quantify the total financial impact of privatization from the perspective of a privatizing city and ultimately its citizens - "citizens' equity value."

Based on the analysis using the suggested valuation method, the PFP model is the most financially attractive option both for YMSN and YMBS among the three models examined in this chapter; the financial value for Yokohama created by the PFP model is largest among the three models. As already discussed, for YMSN, the citizens' equity value of the PFP even in the pessimistic scenario is larger than that for the public ownership or concession model in the base scenario. Likewise, for YMBS, the citizens' equity value of

the PFP model in all scenarios is positive and larger than those of the other two models in all scenarios examined. Given these results, the City of Yokohama should choose the PFP model in order to maximize the citizens' equity value. However, note that this analysis does not incorporate the impact of retained governmental control over a privatized transit service on the financial value at least explicitly, although some assumptions reflect this impact implicitly (for example, the assumption of the 0% fare increase reflecting governmental regulation assumed for fare revision). The sales proceeds from private investors would be discounted if government signals its readiness to intervene with a privatized entity simply because managerial freedom for the entity is limited.

A financially effective option is not necessarily a socially effective option. Even when the citizens' equity (financial) value is maximized, social risks caused by privatization are not necessarily minimized, although the maximization of citizens' equity value should contribute to better social welfare in a general sense as discussed above. The results of social impact and risk analysis in the previous chapter however do not support the argument that privatization affects social welfare negatively. Rather, privatization combined with appropriate governmental interventions can improve service quality, safety, and even employment while at the same time keeping fare levels socially reasonable. If a privatized entity can deliver better transit service with lower cost without significant social risks and if the citizens' equity value can be improved, there is no reason to block publicly-controlled full privatization.

Indeed, relinquishing public ownership of transit systems is a critically important public policy decision because ownership transfer is usually an irreversible process. Once public ownership is lost, the public control over a given asset might be severely weakened. For example, the introduction of new technology for public transit might be delayed by a privatized entity in order to save CAPEX and maximize profits. Likewise, the extension or upgrade of a transit system might be deferred by a profit seeking company even when the public strongly desires it. In fact, private operators are more cost

conscious and attempt to minimize expenses in the interest of profit maximization. In the worst scenario, a privatized entity might encounter financial distress (i.e., go bankrupt), and significant financial and social costs would be ultimately incurred by a privatizing city; the city would need to take over the transit operation and networks in order to ensure continuous transit service provision for the public. Indeed, there are such cases in the history of public transit even in developed nations (e.g. the nationalization of railway networks in the UK in 1948), although the default risk of public transit companies particularly in Japan, which can expect relatively stable cash flow, should be much lower than other businesses (Damodaran, 2006) (this is why the betas and WACCs of comparable transit companies are relatively low²¹).

However, these arguments frequently do not have convincing bases and are based on intuitive fears against privatization. The facts examined in this research suggest that private companies attempt to improve the service quality and to meet the public needs while at the same time improving their fiscal condition. This is because private operators know that they can increase their profits by increasing customer satisfaction, particularly when the operators see potential threats from competitors.

In addition, as already discussed, public control and ownership are discrete concepts; government can retain control over privatized transit systems through effectively designed regulatory or corporate governance mechanisms as discussed in the following chapter. Through these mechanisms, government can control a privatized entity and prevent the above arguments and concerns from being realizing. Government can, for example, facilitate private investments in new technology adoption either through contracts or subsidies (as the London Bus case suggests) or through the post-privatization corporate governance mechanism. Likewise, government can monitor and, if necessary, intervene with the financial management of a privatized entity in a timely and appropriate manner particularly through the corporate governance mechanisms before financial distress results.

²¹ See Table 5-3 and 5-4, p.94

Furthermore, there is no guarantee that government or a public enterprise is more financially and operationally responsible for and capable of transit service provision than private operators, as many cases including JNR suggest. For example, in many developed nations, publicly-owned transit systems are outdated because of the limited financial capacity of public authorities. Furthermore, some municipal governments declare bankruptcy (particularly in the US). Few people from other developed nations can therefore believe that the public sector is more responsible and capable of more sophisticated public transit service delivery than the private sector, particularly when considering the public transit systems in the US, most of which are owned and operated by the public sector. Integrating the analytic results and discussion from this chapter with those from the previous chapter, this research therefore suggests the PFP model as the most effective model for Yokohama and possibly for other municipalities in Japan.

Chapter 6: Summary and Conclusion

This chapter summarizes the key findings from this research. Based on the results of this research, this chapter provides recommendations with some practical suggestions, on which managerial model (among public ownership plus the three privatization models) the City of Yokohama should choose for its public transit systems. More general implications and recommendations for other municipalities particularly in developed nations will also be discussed. Finally, this chapter addresses issues which should be explored in further research.

6.1 Summary

Privatization, the process by which government transfers, partially or entirely, its ownership of public assets to the private sector has been a buzz word for the last three decades. However, privatization arguments particularly in the field of public transportation either by proponents or opponents have not been comprehensive and frequently lack convincing supporting evidence. Some support privatization by emphasizing the financial benefits to privatized companies. Others criticize privatization by arguing that a privatized company will sacrifice the public interest for profit or shareholders' interest. However, holistic arguments accompanying evidence based on both social and financial perspectives have rarely been presented.

The privatization argument for municipally-owned public transit networks in Yokohama is no exception. Due to high municipal debt and problematic financial conditions of the Yokohama Municipal Subway Network (YMSN) and Yokohama Municipal Bus Service (YMBS), Mayor Nakada established the Ad-hoc Committee of Public Transportation (Ad-hoc Committee) in order to evaluate the potential of privatization for the two systems. The Ad-hoc Committee recommended that the city should privatize the two systems to overcome financial problems by following an IPO scheme. However, the Yokohama Transportation Bureau (YTB) has not responded decisively to the recommendation and

may intend to maintain the status-quo even without presenting convincing counter arguments. Similar to privatization arguments in other cases around the world, both parties seem to represent specific interests and have not provided comprehensive arguments reflecting not just the financial perspective but also the social perspective.

Another problem in the privatization argument is that privatization is frequently commingled with deregulation, although deregulation and privatization are logically distinct concepts. Privatization refers to the degree of private ownership. Although many variations of privatization exist, these variations can practically be categorized into two groups: privatized operation and full privatization²². In contrast, deregulation refers to the drastic reduction or elimination of governmental control or influence. Even in the case of full privatization, government can retain control over privatized assets and operation through regulation.

Based on these two distinct dimensions – the degrees of privatization and deregulation, three privatization models are introduced in addition to the public ownership model. The concession model refers to the privatization case in which government transfers only its operation rights to the private sector and retains prior regulatory control over the operation. The second privatization model is a publicly-controlled full privatization in which government relinquishes both asset ownership and operation rights but maintains its control and influence over privatized assets and operation. The final privatization model is market-oriented full privatization in which government substantially relinquishes its regulatory power and ownership.

Based on the case analysis, social influence and risk caused by privatization were analyzed among the three models identified. More specifically, five major issues which are frequently raised as reasons to oppose privatization were examined in terms of their applicability to the actual cases of each model: (1) fare increases (2) worsened service

²² Although asset-transfer privatization in which only asset ownership is transferred from a government to private operators could be the third option, the actual case of asset-transfer privatization is rarely observed in the public transportation arena

quality, (3) lower safety, (4) abandonment or dilution of socially necessary routes, and (5) lay-offs and worsened labor conditions. The quantitative and qualitative analysis did not find evidence that privatization in the three models examined in this research is strongly subject to these five issues except fare increases which are observed in the UK local bus, the case of market-oriented full privatization. In other words, whether the public concerns become real depends not on privatization itself but on the degree of deregulation; government should continue to retain control over the transit system even after full privatization. Considering strong public concerns or skepticism about privatization, this thesis therefore suggests that market-oriented full privatization should be avoided in order to minimize the risk of fare increase by a privatized entity.

A comprehensive financial valuation framework and method are introduced to evaluate the financial value of the three models -public ownership, concession, and PFP- and analyze the financial impact of privatization from the perspective of a city and its citizens by applying the financial data in the Yokohama case. Given the fact that public assets ultimately belong to tax payers (citizens), the value created by the privatization should be analyzed from their perspectives. More specifically, post-privatization financial impact should be analyzed not only by examining the fiscal improvement in a privatized company but by reflecting the impact on tax revenue, subsidies, municipal debt obligations, and other financial items influenced by privatization. To quantify the financial impact of privatization, the perpetuity-based Discounted Cash Flow (DCF) method is applied. Given assumptions established in this research, this thesis found that publicly-controlled full privatization is the most financially attractive option among the three models examined.

6.2 Recommendations for the City of Yokohama

Based on the results of the analysis conducted in this research, this thesis suggests that the City of Yokohama should privatize both YMSN and YSBS following a PFP model. Publicly-controlled full privatization can maximize the citizens' equity value and protect the public interest. As the cases of SMRT, London Bus, and Japan Rails show, even in

full privatization, general social concerns about privatization (i.e., malpractice or excessive profit-seeking behavior sacrificing the public interest) do not have to result from applying the PFP model.

Going beyond the model selection, the city needs to design a specific scheme for the implementation of privatization. The following specific issues should be considered in designing such a scheme.

6.2.1 Combination or Separation

The question of whether the city should privatize YMSN and YMBS as an integrated entity or separate entities is one of the key issues to be considered in designing a concrete privatization scheme, although neither the Ad-hoc Committee nor YTB discussed this. The answer to this question depends on the synergy between the two businesses. If financial and operating synergies would result if the two networks are owned and operated jointly, the city should privatize them as a single entity.

Revenue synergy might exist when passengers would be more likely to use each network because of, for example, the unified service standards and coordinated service provision. Because a unified service planning process between the two networks is required to capture such revenue synergy, operation by a single entity is typically desirable. However, if the government continues to take a major role in a coordinated planning process as is the case in London where TfL controls both bus and underground services, unified service standards and coordinated service provision between the two networks could be maintained even if the two networks are privatized separately.

Cost synergy could result due to economies of scale. Administrative (overhead) cost per unit could be reduced because the two networks can share such costs. However, other operating cost synergies might not be generated from the consolidated operation of the two networks simply because of the different nature of operations. Drivers cannot be shared between the two networks because the skill required for one network is totally

different from that for the other. Procurement costs may not decrease due to the significant differences between the two networks as well. Therefore, much operating cost synergy from the integrated operation should not be expected even when the two systems are operated and owned by a single profit-seeking company.

Given a PFP model in which the city continues to play a significant role in planning service provision and setting operational standards for the two networks, the two networks therefore do not necessarily have to be privatized as a single entity.

6.2.2 Privatization Scheme

The city needs to select a specific form of privatization by addressing the following two questions. First, how many companies should operate the privatized transit service? The city could transfer its assets and operation rights to either a single succeeding company or multiple companies. Second, how should the city transfer its assets and operation rights to succeeding entities? Should the city sell the assets and operation rights directly to private investors or existing companies (i.e., trade sales)? Or, should the city corporatize the assets and operation of YMSN and YMBS and sell their stock to private investors via the public security market (i.e., IPO)?

a) Single vs. multiple companies

The number of entities to which the city transfers its ownership of public transit systems critically influences the degree of competition (the more operators, the more competition). However, competition itself does not necessarily guarantee economic efficiency particularly for a fixed infrastructure like a subway network. The multiple operators and competition among them over a single small fixed network would rather tend to decrease the economic efficiency. On the other hand, the operation and ownership of such an infrastructure by a single entity would enhance the risk of a natural monopoly. However, given the fact that YMSN is already facing competition from private railway companies operating in and around Yokohama, such monopoly risk should be low. If a privatized YMSN would increase fare levels unfairly by leveraging its monopolistic power, many

passengers could relatively easily switch to the competing railway networks. More importantly, strict regulatory controls such as the yardstick competition approach would not allow a privatized single company to leverage its monopolistic power. Therefore, it is not socially risky for the city to transfer its ownership to a single privatized entity in order to maximize the efficiency gained from scale.

Unlike YMSN, the city should transfer its ownership of YMBS to multiple companies for the following reasons. First, because a bus system does not depend on fixed infrastructure, bus routes can be changed flexibly to increase efficiency through competition. Second, the economic advantage from the scale of network is limited compared with a rail network. Cowie and Asenova showed that the increasing returns to the scale can be observed up to £11.1 million in terms of revenue in the UK local bus industry (1999). As this study shows, there is no scale advantage provided by a single dominant operator of an entire regional bus system like YMBS. In sum, as many cases including London Bus and the UK local bus service suggest, the advantages of competition outweigh any scale economies in promoting efficiency for a monopoly.

b) Technical Option of Full Privatization

Although full privatization (i.e., transfer of operation rights and asset ownership) can take a variety of forms in practice, a trade sale (or direct sale) and Initial Public Offering (IPO) are the most common forms of full privatization particularly in public transportation.

The case of London Bus can be categorized as a trade sale scheme because TfL sold the assets of London Bus Ltd to private investors, for example, through Management Buy-Out (MBO). Government typically establishes an open bidding process and allows private investors, who can meet prerequisites established by the government, to participate in the process. A trade sale process is simple and costless compared with an IPO. However, because the winner takes it all and has a strong competitive advantage over losers after the bidding process, competitive fairness is a key issue in a trade sale scheme.

In contrast, in an IPO, asset ownership is openly distributed to private investors through the stock market. In an IPO, government first corporatizes the operation and assets of a public transit system; government transfers asset ownership and operation rights to the newly established profit-seeking entity. Then, government sells all or part of the stock of this entity through a public stock offering. The case of the Japan Railways is a typical example of an IPO. Because the shares of a privatized entity are traded in an open stock market, an IPO seems fairer than a trade sale scheme. Furthermore, because a privatizing government can gradually relinquish its ownership by selling the stock of a privatized entity, government can observe and correct the behavior and performance of a privatized entity.

In addition, through initial stock pricing and gradual stock sales, government can also send clear political signals to citizens and investors. Government, which commits to existing policies supporting privatization, tends to underprice the share price in an IPO and to retain a considerable portion of equity over time because the share price would drop (i.e., the residual equity value retained by government would be eroded) if government changes its privatization policy (Perotti and Guney, 1993, Perotti 1995, Bortolotti, 2001, and Megginson et al., 2004). If government sells shares at once at a higher price, investors would interpret such government behavior as evidence that government may change its policy unfavorably for the privatized company after the one-shot share sales (Perroti/Guney, 1993). Underpricing an IPO also effectively attracts wider participation in the capital market from the middle class, whose votes are critical for a pro-privatization government (Bortolotti et al, 2000 and 2003, and Megginson et al, 2001). However, the critical disadvantage of an IPO is the high cost associated with an IPO process itself. A privatizing government needs to pay large fees to investment banks for issuing stock and arranging an IPO. Therefore, an IPO scheme is not suitable for a relatively small scale privatization.

This thesis recommends an IPO scheme for the full privatization of YMSN although IPO

is more costly than a trade sale scheme in implementation. IPO-based full privatization is more likely to protect the public interest and discourage a privatized entity from leveraging its monopolistic power than a trade sale scheme as long as the city retains a significant equity portion or a “golden share” of the privatized entity as discussed in the following section. By showing the continuing involvement of the city through equity sharing, the city might also alleviate the social concerns or public opposition to privatization. IPO-based full privatization is also a better option for competitive fairness than a trade sale scheme because the assets already built by the city would not be transferred to any existing private companies; privatization would not affect the relative position of all existing transit operators.

Unlike the full privatization of YMSN, this thesis recommends that the city apply a trade sale for full privatization of YMBS. As discussed earlier, YMBS could be transferred to multiple companies because the limited monopoly risks and the absence of significant scale economies. In contrast, an IPO would be unfavorable simply because it is too costly to let multiple privatized entities develop through an IPO scheme. Although there would be a concern with fairness in a trade sale, it can be alleviated by a carefully designed bidding process, particularly when assets are transferred to multiple companies as in the London Bus case. The city could, for example, sell assets (buses and other hardware) to multiple private companies and award them the operation rights for each route through a separate tendering process.

6.2.3 Governmental Control

As stated repeatedly, the city should retain or even reinforce its role and regulatory power over the two privatized public transit networks in order to protect the public interest and alleviate social concerns about privatization. At the same time, the city should collaborate with other major cities in Japan and work to influence the central government to maintain its current regulations such as the yardstick competition approach for public transportation companies.

In addition to traditional regulatory approaches, the city should have several means to control the privatized networks. For YMSN, the city should design a control mechanism through corporate governance. The city can control the privatized companies by retaining a significant portion of shareholders' equity. If the city retains 33.4% of shareholders' equity, the city can have veto power over key managerial decisions of a privatized company. Using a veto, the city can prevent the privatized YMSN from behaving contrary to the public interest. The city can control the privatized YMSN by issuing a "golden share" as in many privatization cases in the UK during Thatcher's regime. A golden share is a stock with a veto over major managerial decisions of a company. Owning only one golden share provides strong control power over a company for government. The range of a veto can be specified in articles of incorporation.

For YMBS, the city should embed the control mechanism in a tendering process and contract with private operators as in the case of London Bus. The service standards and contract price levels can be stipulated in a request for proposal. However, as many cases show, private contractors frequently attempt to increase the contract price and do not follow the service standards which are stipulated in a contract once they win a contract with government, particularly when the government depends on a single operator. In such a situation, it is difficult for the city to control a contractor because government cannot easily switch a contractor to another. Therefore, to decrease the negotiation power of existing contractors and ensure their compliance with a contract, the city should also shorten the contract length. In this way, the city could discourage private bus operators to whom the city transfers asset ownership and operation rights for YMBS.

6.3 General Implications

Although the result of financial impact analysis will vary according to the specific fiscal conditions of the municipality and its transit services, there are still general recommendations which can be drawn from this research for other municipalities in Japan and other developed nations.

First, in privatizing public transit services, government should retain its control over the privatized services either through traditional regulatory schemes or corporate governance mechanisms such as issuing a golden share. As repeatedly stated, privatization and deregulation are distinct concepts; and government cannot and should not escape from its responsibility to protect the public interest with respect to public transit services even after privatization. In successful cases of full privatization including London Bus, Singapore's MRT system, and Japan National Rails, government continues to play a significant role in planning and controlling privatized entities and their service delivery.

However, as already mentioned, retaining or reinforcing existing governmental control over a privatized service is likely to lower the sales value of a given transit system. Private investors are reluctant to invest in the business in which their managerial freedom is limited by the public interventions. For example, issuing a golden share would decrease the sales price of assets simply because other shareholders would prefer not to have government maintain such powerful influence over their companies through only a single share. In addition, investors might interpret a golden share as evidence that government would not like a privatized entity to be radically reformed by private participants (Damodaran, 2002). Retaining a significant portion of equity share of a privatized entity literally means that government cannot capture all business value assumed by private investors simply because government does not sell all the equity shares to the private investors. Governmental interventions which does not allow a privatized entity from exiting from unprofitable routes or to lay off existing labor might decrease the sales value significantly because the room to improve the fiscal condition of acquired assets is limited and meaningful improvement in cash flow (therefore, business value) cannot be expected. In sum, government needs to choose an optimal point at which the social risk potentially caused by privatization is minimized and financial value is maximized given the social risk levels, in the trade-off between the degrees of deregulation and privatization.

Second, by retaining governmental control, government can privatize its public transit service in order to improve service standards and operational efficiency if government alone cannot achieve these objectives. Government or the public transit authority alone tends to neglect improving service and efficiency for bureaucratic reasons and lack of incentive or discipline. In fact, as all cases examined in this research show, performance measurements including service quality and safety have generally improved significantly after privatization. At least, government should continue to use the threat of privatization with the transit authority by clearly stating that government will privatize transit services if the authority alone cannot improve operations. Indeed, the strong pressure from Mayor Nakada and his Ad-hoc Committee has worked effectively to force YTB to reform itself although the impact of the reform is still not sufficient.

Third, the financial impact of privatization should be examined not from the perspective of a privatized company but from a privatizing government and ultimately its citizens (i.e., based on the citizens' equity value). In many studies, the impact of individual metrics, not total value, is examined, and financial benefits of privatization for a privatized company, not for the government or its citizens, is argued. However, because the privatization of public transportation affects municipal welfare greatly, a comprehensive financial analysis from the city's perspective should be conducted before a privatization decision. The public assets ultimately belong to citizens. Therefore, government is responsible for maximizing the financial value of assets and sales proceeds from private investors in selling the assets; government should not give citizens' assets as a free gift to the private sector as occurred in the London Bus case.

6.4 Further research

This research provided a holistic analysis of the privatization of a public transit system by integrating the social and financial perspectives and examining the case of Yokohama. Based on the analysis conducted, this thesis suggests an effective privatization model of a municipal public transit system that alleviates the social concerns about privatization

and maximizes the financial value for the public. However, there are several areas to be explored through further research.

¶ **Reinforce the social impacts of privatization:** More cases for each privatization model in developed nations should be identified and analyzed to establish more solid general conclusions about effective privatization models, although this research examined major privatization cases for public transit. In particular, the US cases of a concession model should be more rigorously analyzed from the social perspective. In addition, the cases examined in this research should be analyzed more deeply in order to illuminate or exclude the influence from factors other than privatization itself. Further research needs to show whether, for example, improvements in service quality and safety levels after privatization were achieved mainly through privatization or through other factors.

¶ **Conduct more solid financial simulation:** There are several areas to be reinforced in the financial impact analysis. Although this research employed the perpetuity valuation method to examine the financial impact of privatization, this method tends to overestimate financial value as mentioned in Chapter 5. To overcome this issue, researchers could apply the Discounted Cash Flow method with more detail and longer projection for each financial item examined.

Second, the key assumptions for the valuation could be reinforced by gathering more cases and data and by drilling down in each financial item to obtain more detailed performance measures. For example, the number of employees could be broken down into the product of passenger-kilometer and the number of employees per passenger-kilometer. In this way, cost items could be linked to the change in the demand for the service (i.e., the service demand), and a more accurate financial simulation could be conducted.

Third, valuation analysis should be conducted in more detail for technical options (i.e., trade sale and IPO) of a PFP model because the sales price obtained from private investors would be influenced by these options as well as the equity share retained by the city.

Fourth, the financial and operational synergies should be quantified and reflected in the valuation analysis. As stated earlier, there should be business synergies between subway and bus systems. However, because of limited data availability, this research could not quantify such synergies. In the extension of this research, the synergy between the two businesses could be quantified by gathering more data and incorporating it into the financial valuation model.

Finally and most importantly, the financial impact of the relinquishment of governmental control over the privatized assets should be reflected in the valuation model more explicitly and to allow quantification of the trade-off between financial value and social risks.

¶ **Extend the valuation to other cases:** In this research, the financial simulation depends on the data of the Yokohama case primarily due to data availability. Because major Japanese municipalities owning both subway and bus networks seem to have a similar financial conditions to Yokohama, the result of valuation would hypothetically not vary among them. However, to prove this hypothesis, a valuation analysis with the same framework developed in this research should be conducted for those major cities. Furthermore, this valuation analysis should be extended to cases in other nations in order to test the validity of the framework and method and to obtain more universal conclusions.

¶ **Identify the determinants and critical conditions for successful privatization:** Although this research did not analyze and identify the factors contributing to

successful privatization of public transit systems, whether privatization can be successful socially and financially is likely to be influenced by certain conditions. For example, the question of why private transit operation can be a default managerial option in Japan but not in the US or other developed nations is interesting and important to defining the conditions or determinants of successful and sustainable privatization. By answering this kind of question, further research could provide more general policy guidance or implications for the municipalities outside Japan.

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APPENDIX A: VALUATION MODEL FOR YMSN

VALUATION SIMULATION PANEL –YMSN

Model 1 1: Status-Quo (Public Ownership)
2: Concession
3: PFP

Scenario 1 1: BASE
2: Optimistic
3: Pessimistic

Tax rate 0% Scenario 1: No Tax; Scenario 2: Tax; Scenario 3: Tax
41%

WACC 2 1: 2.6%; 2: 4.6%

Cash Flow Growth 0.0%

	Revenue					Operating Cost					CAPEX
Business Value	# of Ridership(million)	Ave. Fare (JPY)	Ridership Rev.	Advertising	Subsidy	# of Employee	Ave. Salary (JPY)	Labor Cost	Admin & other	Depreciation	
Direction of Change	+	+	+	+	-	-	-	-	-	-	-
Change %	0%	0%	0%	0%	0%	20%	5%	24%	0%	3%	0%
Before	171	175	29,998	932	2,913	881	11	9,298	4,056	13,024	11,752
After	175	175	29,998	932	2,913	705	10	7,066	4,056	12,634	11,752
Change	5	0	0	0	0	-176	-1	-2,232	0	-390	0
	EBIT	EBITDA	FCF	Business Value							
Change %	35%	11%	35%	35%							
Before	7,465	20,489	6,306	137,087							
After	10,087	22,721	8,538	185,598							
Change	2,622	2,232	2,232	48,511							
Impact for the City	Municipal Tax	PV of Corporate Tax	PV of Labor cost shifted	PV of Subsidy Red.	PV of Saved int. PMT	Annual Contractor's net proceeds ¹	PV of annual contractor's net proceeds	Required Contractor's EBIT Margin			
	+	+	-	+	+	+	+	N/A			
	0	0	0	0	0	0	0				

* Annual Contractor's Net Proceeds=(1+Required Contractor's EBIT margin)*(Total Operating Cost less Depreciation)-(Total Operating Cost less Depreciation)

Source: Annual Financial Report ("Kessan Houkoku-Syo") '03, '04, and '05 (YBT), Jack T.Nakajima

PV OF MUNICIPAL CORPORATE TAX & SUBSIDY - YMSN

WACC	4.6%	
Scenario	1	BASE

PV of Corporate TAX Concession
(Million JPY)

Corporate tax	241	!!To be changed according to the change in "Valuation Simulation" !!
WACC	4.6%	
Cash Flow Growth rate*	0.0%	
PV of Tax for Yokohama**	5,242	

* Assuming tax revenue is creased with same pace as Cash Flow Growth Rate

** On Average, 33% of Total Corporate Tax is counted as the tax revenue for a local government in Japan

PFP

Corporate tax	4,723	!!To be changed according to the change in "Valuation Simulation" !!
WACC	4.6%	
Cash Flow Growth rate*	0.0%	
PV of Tax for Yokohama**	102,683	

* Assuming tax revenue is creased with same pace as Cash Flow Growth Rate

** On Average, 33% of Total Corporate Tax is counted as the tax revenue for a local government in Japan

PV of Subsidy
(Million JPY)

Public Ownership

Subsidy ("Status Quo")	2,913
WACC	4.6%
PV of Subsidy	63,326

Concession

Subsidy (Privatized Operation)	2,913	!!To be changed according to the change in "Valuation Simulation" !!
WACC	4.6%	
PV of Subsidy	63,326	
PV of Subsidy Reduction	0	

PFP

Subsidy (Asset Transfer)	0	!!To be changed according to the change in "Valuation Simulation" !!
WACC	4.6%	
PV of Subsidy	0	
PV of Subsidy Reduction	63,326	

PV OF LABOR COST TRANSFERRED TO THE CITY – YMSN

(Million JPY)

	Salary	# of labor laid off	# of labor transferred	PV of labor cost transferred
Public Ownership	10	176	0	0
Concession	10	176	0	0
PFP	10	264	88	2,020

Years until retirement	4
------------------------	---

Public Ownership	Wage Cut	5%
	Layoff (transfer to the city)	20%

	# of Labor	Ave.Salary	Labor Cost	Change %
"Before"	881	11	9,298	N/A
After improvement	705	10	7,066	N/A
Impact	176	1	2,232	-24%

WACC	4.6%
PV of Labor cost transferred	0

	Year 1	Year 2	Year 3	Year 4	Year 5
# of transferred	0.0	0.0	0.0	0.0	0.0
Labor Cost	0	0	0	0	0

Concession	Wage Cut	5%
	Layoff (transfer to the city)	20%

	# of Labor	Ave.Salary	Labor Cost	Change %
"Before"	881	11	9,298	N/A
Privatized Operation	705	10	7,066	N/A
Impact	176	1	2,232	-24%

WACC	4.6%
PV of Labor cost transferred	0

	Year 1	Year 2	Year 3	Year 4	Year 5
# of transferred	0.0	0.0	0.0	0.0	0.0
Labor Cost	0	0	0	0	0

PFP	Wage Cut	5%
	Layoff (transfer to the city)	30%

	# of Labor	Ave.Salary	Labor Cost	Change %
"Before"	881	11	9,298	N/A
Asset-transfer	617	10	6,183	N/A
Impact	264	1	3,115	-34%

WACC	4.6%
PV of Labor cost transferred	2,020

	Year 1	Year 2	Year 3	Year 4	Year 5
# of transferred	88.1	66.1	44.1	22.0	0.0
Labor Cost	883	662	442	221	0

PV OF INTEREST PAYMENT SAVING - YMSN

(Million JPY)

Residual Debt ('05)	PED*	350,668
	Special Debt **	16,410
	Other debt***	166,173
	Short-term Debt	301
	Total	367,078
Interest Payment (05)		16,167
Interest Rate		4.40%
Amount of Debt subject to interest saving****		140,396
Payback*****		29,987
Residual debt (E07)		307,104

PV of Int. Saving 17,577 "To be changed according to the business value"

*Public Enterprise Debt: "Ko-ei-Kigyo-sai"

**"Tokurei-sai"

***Short-term Debt + "Shihonhi-Futan Kanwabun Kigyo-sai"

****Assuming that the amount of debt equal to the amount of cash-in from the purchaser due to the asset sales is paid back to debt holders immediately

***** Assuming that the city of Yokohama would keep paying back the same amount of 2005

	2007	2008	2009	2010	2011	2012	2013
	Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7
	1	2	3	4	5	6	7
Int PMT		6,183	5,135	4,040	2,898	1,705	459
Amount of Debt subject to int saving	140,396	116,592	91,740	65,794	38,704	10,422	-19,106
PV of Int. PMT	0	5,673	4,512	3,401	2,336	1,316	339

FREE CASH FLOW SIMULATION –YMSN

Model	1	SQ
Scenario	1	BASE
Tax rate	0%	

Million JPY		BASE	Changed	%Change
Revenue	Ridership	29,998	29,998	0%
	(# of passengers: million)	171	171	0%
	(Ave. Fare)	175	175	0%
	Advertisement	932	932	0%
	Subsidy	2,913	2913	0%
Total Revenue		33,843	33,843	0%
Costs	Labor Cost	9,298	7,066	24%
	(Ave. Salary: million JPY)	11	10	5%
	(# of labors)	881	704.8	20%
	Other Operating Costs	4,056	4056	0%
	Operating costs except Depreciation	13,354	11,122	17%
	Depreciation	13,024	12633.7	3%
Total Operating costs		26,378	23,756	-10%
Profit	EBIT	7,465	10,087	35%
	EBITDA	20,489	22,721	11%
	Tax	0	0	#DIV/0!
Net Income		7,465	10,087	35%
Net Income without subsidy		4,552	7,174	58%
Working Capital	Short-term Assets less cash	N/A	N/A	N/A
	Short-term liabilities less debts	N/A	N/A	N/A
	Working Capital	N/A	N/A	N/A
Change in Working Capital		2,431	2,431	0%
CAPEX	Capital Expenditure	11,752	11752	0%
Free Cash Flow		6,306	8,538	35%

Source: Annual Financial Report ("Kessan Houkoku-Syo") '03, '04, and '05 (YTB), Jack T.Nakajima

DEPRECIATION SIMULATION –YMSN

Depreciation Simulator

Scenario

Status-quo

			Change in CAPEX	
			0%	
	BASE		Simulation	
Depreciation	13,024	13,024	13,024	12,634 3.0%
CAPEX	11,752	11,752	0	
PPE in End	517,531	434,554	421,530	
Dep. Rate	3%			

Concession

			Change in CAPEX	
			0%	
	BASE		Simulation	
Depreciation	13,024	13,024	13,024	12,634 3.0%
CAPEX	11,752	11,752	0	
PPE in End	517,531	434,554	421,530	
Dep. Rate	3%			

PFP

			Change in CAPEX	
			10%	
	BASE		Simulation	
Depreciation	13,024	13,024	13,024	12,669 2.7%
CAPEX	11,752	11,752	1,175	
PPE in End	517,531	434,554	422,705	
Dep. Rate	3%			

APPENDIX B: VALUATION MODEL FOR YMBS

VALUATION SIMULATION PANEL –YMBS

Model	1	1: Status-Quo (Public Ownership) 2: Concession 3: PFP
Scenario	1	1: BASE 2: Optimistic 3: Pessimistic
Tax rate	0% 41%	Scenario 1: No Tax; Scenario 2:Tax; Scenario 3: Tax
WACC	2	1:1.8%; 2:3.8%
Cash Flow Growth	0.0%	

Business Value	Revenue					Operating Cost					CAPEX
	# of Ridership (million)	Ave. Fare (JPY)	Ridership Rev.	Advertising	Subsidy	# of Employee	Ave. Salary (JPY)	Labor Cost	Admin & other	Depreciation	
Direction of Change	+	+	+	+	-	-	-	-	-	-	-
Change %	0%	0%	0%	0%	80%	3%	5%	8%	0%	4%	0%
Before	152	160	24,336	445	2,503	2,422	8	20,081	3,801	2,293	1,796
After	160	160	24,336	445	501	2,349	8	18,505	3,801	2,210	1,796
Change	9	0	0	0	-2,002	-73	0	-1,576	0	-83	0
	EBIT	EBITDA	FCF	Business Value							
Change %	-31%	-13%	-113%	-113%							
Before	1,109	3,402	376	9,882							
After	766	2,976	-51	-1,330							
Change	-343	-426	-426	-11,212							
Impact for the City	Municipal Tax	PV of Corporate Tax	PV of Labor cost	PV of Subsidy Red.	PV of Saved int. PMT	Annual Contractor's net proceeds ¹	PV of annual contractor's net proceeds	Required Contractor's EBIT Margin			
	+	+	-	+	+	+	+				
	0	0	0	0	0	0	0	N/A			

* Annual Contractor's Net Proceeds=(1+Required Contractor's EBIT margin)*(Total Operating Cost less Depreciation)-(Total Operating Cost less Depreciation)

Source: Annual Financial Report ("Kessan Houkoku-Syo") '03, '04, and '05 (YBT), Jack T.Nakajima

PV OF MUNICIPAL CORPORATE TAX & SUBSIDY - YMBS

WACC	3.8%	
Scenario	1	BASE

**PV of Corporate TAX Concession
(Million JPY)**

Corporate tax	493
WACC	3.8%
Cash Flow Growth rate*	0.0%
PV of Tax for Yokohama**	12,982

* Assuming tax revenue is creased with same pace as Cash Flow Growth Rate

** On Average, 33% of Total Corporate Tax is counted as the tax revenue for a local government in Japan

PFP

Corporate tax	2,017	!!To be changed according to the change in "Valuation Simulation" !!
WACC	3.8%	
Cash Flow Growth rate*	0.0%	
PV of Tax for Yokohama**	53,091	

* Assuming tax revenue is creased with same pace as Cash Flow Growth Rate

** On Average, 33% of Total Corporate Tax is counted as the tax revenue for a local government in Japan

**PV of Subsidy
(Million JPY)****Public Ownership**

Subsidy ("Status Quo")	501
WACC	3.8%
PV of Subsidy	13,174

Concession

Subsidy (Privatized Operation)	501	!!To be changed according to the change in "Valuation Simulation" !!
WACC	3.8%	
PV of Subsidy	13,174	
PV of Subsidy Reduction	0	

PFP

Subsidy (Asset Transfer)	250	!!To be changed according to the change in "Valuation Simulation" !!
WACC	3.8%	
PV of Subsidy	6,587	
PV of Subsidy Reduction	6,587	

PV OF LABOR COST TRANSFERRED TO THE CITY - YMBS

(Million JPY)

	Salary	# of labor laid off	# of labor transferred	PV of labor cost transferred
Status-quo	8	73	0	0
Privatized operation	8	73	0	0
Full Privatization	7	145	73	1,329

Years until retirement	4
------------------------	---

Public Ownership

Wage Cut	5%
Layoff (transfer to the city)	3%

	# of Labor	Labor cost per capita	Labor Cost	Change %
"Before"	2,422	8	20,081	N/A
Privatized Operation	2,349	8	18,505	N/A
Impact	73	0	1,576	-8%

WACC	3.8%
------	------

PV of Labor cost transferred	0
------------------------------	---

	Year 1	Year 2	Year 3	Year 4	Year 5
# of transferred	0.0				
Labor Cost	0				

Concession

Wage Cut	5%
Layoff (transfer to the city)	3%

	# of Labor	Labor cost per capita	Labor Cost	Change %
"Before"	2,422	8	20,081	N/A
Privatized Operation	2,349	8	18,505	N/A
Impact	73	0	1,576	-8%

WACC	3.8%
------	------

PV of Labor cost transferred	0
------------------------------	---

	Year 1	Year 2	Year 3	Year 4	Year 5
# of transferred	0.0	0.0	0.0	0.0	0.0
Labor Cost	0	0	0	0	0

PFP

Wage Cut	10%
Layoff (transfer to the city)	6%

	# of Labor	Labor cost per capita	Labor Cost	Change %
"Before"	2,422	8	20,081	N/A
Asset-transfer	2,277	7	16,989	N/A
Impact	145	1	3,092	-15%

WACC	3.8%
------	------

PV of Labor cost transferred	1,329
------------------------------	-------

	Year 1	Year 2	Year 3	Year 4	Year 5
# of transferred	72.7	54.5	36.3	18.2	0.0
Labor Cost	572	429	286	143	0

PV OF INTEREST PAYMENT SAVING - YMBS

(Million JPY)

Residual Debt ('05)	PED*	5,882
	Special Debt **	0
	Other debt***	0
	Short-term Debt	2,312
	Total	8,194
Interest Payment (05)		123
Interest Rate		1.50%
Amount of Debt subject to interest saving****		8,194
Payback*****		1,541
Residual debt (E07)		5,112
PV of Int. Saving		167

*Public Enterprise Debt: "Ko-ei-Kigyo-sai"

***Tokurei-sai"

***Short-term Debt + "Shihonhi-Futan Kanwabun Kigyo-sai"

****Assuming that the amount of debt equal to the amount of cash-in from the purchaser due to the asset sales is paid back to debt hc

***** Assuming that the city of Yokohama would keep paying back the same amount of 2005

	2007	2008	2009	2010	2011
	Yr1	Yr2	Yr3	Yr4	Yr5
	1	2	3	4	5
Int PMT		77	55	32	10
Amount of Debt subject to int saving	5,112	3,648	2,161	653	-878
PV of Int. PMT	0	74	52	31	9

FREE CASH FLOW SIMULATION –YMBS

Model	1	SQ
Scenario	1	BASE
Tax rate	0%	

Million JPY		BASE	Changed
Revenue	Ridership	24,336	24,336
	(# of Passengers)	152	152
	(Ave. Fare)	160	160
	Advertisement	445	445
	Subsidy	2,503	501
Total Revenue		27,284	25,282
Costs	Labor Cost	20,081	18,505
	(Wage)	8	8
	(# of labors)	2,422	2,349
	Other operating costs	3,801	3,801
	Operating costs except Depreciation	23,882	22,306
	Depreciation	2,293	2,210
Total Operating costs		26,175	24,515
Profit	EBIT	1,109	766
	EBITDA	3,402	2,976
	Tax	0	0
	Net Income	1,109	766
Net Income without subsidy		-1,394	266
Working Capital	Short-term Assets less cash	N/A	N/A
	Short-term liabilities less debts	N/A	N/A
	Working Capital	N/A	N/A
Change in Working Capital		1,231	1,231
CAPEX	Capital Expenditure	1,796	1,796
Free Cash Flow		376	-51

Source: Annual Financial Report ("Kessan Houkoku-Syo") '03, '04, and '05 (YTB), Jack T. Nakajima

DEPRECIATION SIMULATION –YMBS

Scenario

1	BASE
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Status-quo

			Change in CAPEX		
			0%		
	FY2005	BASE	Simulation		
Depreciation	2,293	2,293	2,293	2,210	3.6%
CAPEX	3,079	1,796	1,796		
PPE in End	13,662	13,662	13,165		
Dep Rate	17%				

Concession

			Change in CAPEX		
			0%		
	FY2005	BASE	Simulation		
Depreciation	2,293	2,293	2,293	2,210	3.6%
CAPEX	3,079	1,796	1,796		
PPE in End	13,662	13,662	13,165		
Dep Rate	17%				

PFP

			Change in CAPEX		
			10%		
	FY2005	BASE	Simulation		
Depreciation	2,293	2,293	2,293	2,179	5.0%
CAPEX	3,079	1,796	1,616		
PPE in End	13,662	13,662	12,985		
Dep Rate	17%				

APPENDIX C: EARNING BEFORE INTEREST AND TAX (EBIT) OF COMPARABLE COMPANIES

EBIT Margin of The Four Comparable Railway Operators

Million JPY

		Sales			EBIT			EBIT%		
		2004	2005	Average	2004	2005	Average	2004	2005	Average
JR East	9020JP	2,537,486	2,592,393	2,564,940	358,534	396,099	377,317	14.1%	15.3%	14.7%
Keihin Kyuko	9006JP	316,666	311,961	314,314	30,869	33,178	32,024	9.7%	10.6%	10.2%
Sagami Tetsu	9003JP	309,628	304,584	307,106	22,192	21,999	22,096	7.2%	7.2%	7.2%
Tokyu	9005JP	1,055,564	1,388,554	1,222,059	77,014	85,564	81,289	7.3%	6.2%	6.7%
Average								9.6%	9.8%	9.7%
Median								8.5%	8.9%	8.7%

Source: Annual Financial Reports of Fiscal Year 2005, Jack T.Nakajima (2006)

EBIT Margin of Three Comparable Bus Operators

Million JPY

		Sales			EBIT			EBIT%		
		2004	2005	Average	2004	2005	Average	2004	2005	Average
Kanachu	9020JP	135,909	136,582	136,246	7,637	6,973	7,305	5.6%	5.1%	5.4%
Iliigata Kotsu	9006JP	29,598	27,799	28,699	1,768	1,520	1,644	6.0%	5.5%	5.7%
Shinkai Bus	9003JP	36,489	37,658	37,074	1,943	1,606	1,775	5.3%	4.3%	4.8%
Average								5.6%	4.9%	5.3%
Median								5.6%	5.1%	5.4%

Source: Annual Financial Reports of Fiscal Year 2005, Jack T.Nakajima (2006)

