

The Politics of Institutional Design*

– Comparing Agency Selection in Japan and the U.K –

영·일 철도민영화의 제도설계 비교 연구

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ABSTRACT

이 논문은 합리적 선택 제도에 기초하고 있다. 즉, 정치 주체는 효용을 최대화하려 한다는 정치학적인 원리에 기초하여 집행기관의 유형별 차이를 철도 사고에 초점을 맞춰 분석하였다. 집권당은 정치적 방해와 책임성이라는 측면에서 어느 규제기관을 선택해야 할지에 대한 강한 동기를 갖게 된다. 첫째로 일본 철도와 영국 철도에서 보고된 자료를 기초로 중대한 사고, 예를 들어 사상자가 발생한 경우 등의 통계를 관찰하였다. 기존 선행연구 역시 효율적인 민영화 방안에 대하여 정치학적 원리를 제시하고 있으며, 이 연구도 이러한 틀에 포함된다고 할 수 있다. 결과적으로 정치적 성취를 강조하려 한다면, 새롭게 만들어지는 조직의 유형에 주의를 기울이지 않으면 안 된다. 이 논문은 수리모델을 통해 효율적인 철도 민영화를 위한 최적 방안을 제시하고 있다.

Key words: 거래비용의 정치학, 제도 설계, 철도 민영화

1. INTRODUCTION

With the wave of rail privatization that has spread throughout the world, lots of countries are creating new organizations to regulate the behavior and performance of their newly privatized railways. Little academic work has been done on the optimal design of these new organizations in the realm of political science. To improve our comprehension of what this design should take into account, it seems reasonable to ask why the political principals select different types of regulatory agencies. Ideally, such regulatory agencies must be existed not only as neutral something but also as an objective performer politically. However, the complete

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independency of politics is not possible, and it is not desirable again. If a regulatory agency does not become independent of political intervention, the regulation process will be politicized and the regulation policy may lose continuity and consistency. In contrast, there is a possibility that a regulatory agency does not cope with a government's policy when very high independency has been given to it. Therefore, the important problem is how a regulatory agency takes balance between independence of political will and subordination to politics in each country.

The railway business is one industry in which political interference is the strongest, and generally an administrative office has been responsible for controlling railways such as Japan, Denmark and Sweden. On the other hand, The British Conservative Party established the independent regulatory agency to regulate private railways after having privatized British Rail. In Canada and The U.S.A., an independent agency also has been in charge of regulation.

The extent to which these types of regulatory agencies are affected by the preferences of political principal has been a topic of interest among political scientists for decades. Recent researches that have analyzed this issue have emphasized that coalition participants maximize future political benefits by using strategic behavior. The earliest study in this perspective (e.g., McCubbins et al. 1987, 1989; Moe 1989, 1990; Horn 1995) focused on the importance of guarding the enacted position from political opponents, while at the same time preventing losses due to drift during policy implementation. These studies have made advances over time using contract theory (e.g., Epstein and O'Halloran 1999; Huber and McCarty 2004). Other scholars emphasized transaction costs that influenced economic policies (e.g., North 1990; Dixit 1996, 2003), the act of initial agency creation (e.g., Wood and Bohte 2004), and railway privatizations (e.g., Nam 2003). However, past theoretical developments have not placed institutional selections into a coherent theoretical framework. On the empirical side, past studies have focused not only on delegation of power to the agency but also preexisting bureaucracies exclusively, ignoring the selective behavior of political principal.

In this paper, I analyze what determines the design of regulatory agencies. My premise is that the main difference between administrative office and independent regulatory agency lies in how much a political principal takes interventions and responsibilities. If a political principal chooses internal agency to regulate a railway, he will be responsible for voters when railway accidents occur. But, if he selects external agency, the responsibility will not be so strong in comparison with the internal one. On the contrary, a political principal could intervene in internal

agency easily, compared with an external agency. Armed with this premise, I analyze a model of institutional choice in which a political planner decides the different types of agency to maximize his utility.

This paper is organized as follows; Section 2 outlines the problem of agency design; Section 3 provides the study propositions as well as the model that will be used to test them; Section 4 presents the empirical analysis of the results; and Section 5 outlines the study's conclusions.

2. The Problem of Agency Design

Consider the following illustrative cases.¹⁾ Almost all the risks to health and safety arising from work activity in Britain are regulated through a single framework. The Health and Safety Commission (HSC) and the Health and Safety Executive (HSE) are the bodies responsible for the encouragement, regulation and enforcement of workplace health, safety and welfare, and for research into occupational risks in England, Wales and Scotland. HSC²⁾ and HSE are non-departmental bodies with specific statutory functions in relation to health and safety, and were created by the Health and Safety at Work etc Act 1974. In the White Paper *New Opportunities for the Railways* which was published by the Conservative in July 1992, it stated that the new safety framework would recognise the HSE as the independent safety regulatory authority.³⁾ And the HSE has absorbed earlier regulatory bodies such as the Factory Inspectorate and the Railway Inspectorate.⁴⁾

The HSE is a body of three people appointed by the HSC with the consent of

1) The development of British regulatory institution can be found in Prosser (1997).

2) In practice, HSC delegated its responsibilities to HSE. On 1 April 2008, HSC merged with HSE.

3) CM 2012. (1992). *New Opportunities for the Railways*, London: HMSO, paragraph 78.

4) Her Majesty's Railway Inspectorate is the British organisation responsible for overseeing safety on Britain's railways and tramways. Previously a separate non-departmental public body it was, from 1990 to April 2006, part of the Health and Safety Executive; and transferred to the Office of Rail Regulation in April 2006. The function of HMRI was to inspect and approve all new (or modified) railway works and to investigate railway accidents; and the two activities were carried out by separate parts of the HMRI. Accident investigations have tended to be held in public; and the findings were published as HMRI Railway Accident Reports. These investigations were inquisitorial, in that their aim was to determine the causes behind the accident and to make recommendations to avoid re-occurrence.

the Secretary of State for Transport, Local Government and the Regions. The Executive advises and assists the Commission in its functions. It has some specific statutory responsibilities of its own, notably for the enforcement of health and safety law. The Executive's staff, approximately 4000, includes inspectors, policy advisers, technologists and scientific and medical experts.

As illustrated by the case of the HSC, administrative designs are often constrained by the intention of a political principal. The political principal seeks an administrative design that will produce the largest future benefit.

Nam (2003) labeled this type of institutional choice transaction cost⁵⁾, in particular agency cost. Agency cost occurs when the expected benefit of political principal shifts relative to that of regime change. He defines agency cost as cost to control a gap to occur between activity results of an agent and the preference of principal, after assuming a political party system. And he compares three countries, the U.K, Germany and Japan that have different party systems. Because agency cost is low, under the predominant party system and the multi-party system, an administrative agency (internal agency) comes to be in charge of regulation. In contrast, under two-party system, a political principal chooses an independent agency (external agency) to regulate railways, since agency cost is high. And then he tested a hypothesis for ten another countries.

In spite of his persuasive discussion that includes various observable implications, I can point out that his independent variable (party system) is exogenous. Namely, agency is automatically determined by a party system that is given. The possibility of agency cost means that the administrative design is not dynamic, but static. Under this circumstance, decision makers must factor into their forecast of expected benefit the probability of whether regime change will occur or not, and that it will alter policy. Premising Nam's discussion, I use the economic technique of formal model in this paper⁶⁾.

3. The Model

5) Political transaction costs are those costs associated with monitoring and maintaining the principal-agent contract with the administering agency.

6) Of course, although his discussion is prone to the deterministic and static, the most closely related work to mine is that by Nam (2003). He developed a political transaction cost theory of why the Conservative chooses independent regulatory agency, while the Liberal Democratic Party delegates government office.

The model I describe in this section focuses on a specific notion of institutional design that is related to the utility of the ruling party to select the desired agency. First of all, I would like to distinguish the internal agency from the external agency. The internal agency is departmental body (executive agency) that is applied by a National Government Organization Law. By contrast, the external agency is a non-departmental body that differs from executive agency as it is not created to carry out ministerial orders or policies, instead it is more or less self-determining and enjoys greater independence. It is also not directly part of government like a non-ministerial government department removed from ministers and any elected assembly or parliament. Typically it would be established under statute and be accountable to Parliament rather than to the Government. This arrangement allows more financial independence since the government is obliged to provide funding to meet statutory obligations.

My approach to modeling agency selection in the presence of intervention and responsibility problems is as follows. Consider a society that has to decide whether a political principal chooses internal agency or an external agency, and nature determines the rate of the accident. It is worth noting that the rate of the accident is exogenously given.

This paper examines a two-stage game. In stage one, the ruling party observes the rates of the accident, which is reported by the rail in terms of passenger casualties and the number of train accidents. And then, in stage two, after observing the rates of the accident, the ruling party decides whether it puts a regulatory agency under control or not.

I set four assumptions as follows:

Assumption 1. $p_{II} < p_{IE}$ for all A , $A \in [0, \infty]$

Assumption 2. $p_{RI} > p_{RE}$ for all A , $A \in [0, \infty]$

Where p_{II} is the price for the internal agency's intervention, p_{IE} is the price for the external agency's intervention. The price for the internal agency to buy one unit of intervention is cheaper than that of the external agency for all accident rates. In contrast, the price for the internal agency to buy one unit of responsibility is more expensive than that of the external agency for all accident rates.

Assumption 3. $p_{RI} > p_{RII}$ and $p_{RE} > p_{REI}$ if $A < A^*$

Assumption 4. $p_{RI} < p_{RII}$ and $p_{RE} < p_{REI}$ if $A > A^*$

In the case where the accident rates are lower than that of the optimum accident rates, to buy one unit of this responsibility is more expensive than that of intervention. To help our understanding easily, let us consider a society that does not have accidents. In that world, since accident rates are extremely low, we do not need to have incentive and motivation in order to buy responsibility. The reverse is the same.

It is important to bear in mind that the ultimate outcome from any selective behavior attempted by the Ruling Party is a function of Intervention (I) and Responsibility (R). Thus, the utility function for the Ruling Party is specified by

$$U(I, R)$$

The budget set of the Ruling Party is given by

$$p_I I + p_R R \leq Y$$

The maximization problem for the Ruling Party is specified by

$$\begin{aligned} & \text{Max}_{I, R} U(I, R) \\ & \text{s. t. } p_I I + p_R R \leq Y \end{aligned}$$

For solving maximization problems with the constrained condition, I use the method of the Lagrange multiplier. Maximization problems of this nature are best solved by the Lagrange multiplier method. By rearranging the maximization problem, I have

$$L = U(I, R) + \lambda(Y - p_I I - p_R R)$$

where λ is the Lagrange multiplier. Differentiating the Lagrange with respect to I, R and λ gives us the first-order conditions:

$$\frac{\partial L}{\partial I} = \frac{\partial U}{\partial I} - \lambda p_I = 0 \quad (1)$$

$$\frac{\partial L}{\partial R} = \frac{\partial U}{\partial R} - \lambda p_R = 0 \quad (2)$$

$$\frac{\partial U}{\partial \lambda} = Y - p_R R - p_I I = 0 \quad (3)$$

By dividing the Eq. (2) by Eq. (1) in order to interpret these conditions, we can obtain

$$\frac{\frac{\partial U}{\partial R}}{\frac{\partial U}{\partial I}} = \frac{p_R}{p_I}$$

The fraction of the LHS is the marginal rate of substitution between R(responsibility) and I(intervention), and the fraction of the RHS might be called the economic rate of substitution between I and R. Suppose they are not; for example, suppose

$$\frac{\frac{\partial U}{\partial R}}{\frac{\partial U}{\partial I}} = 1 \neq 2 = \frac{p_R}{p_I}$$

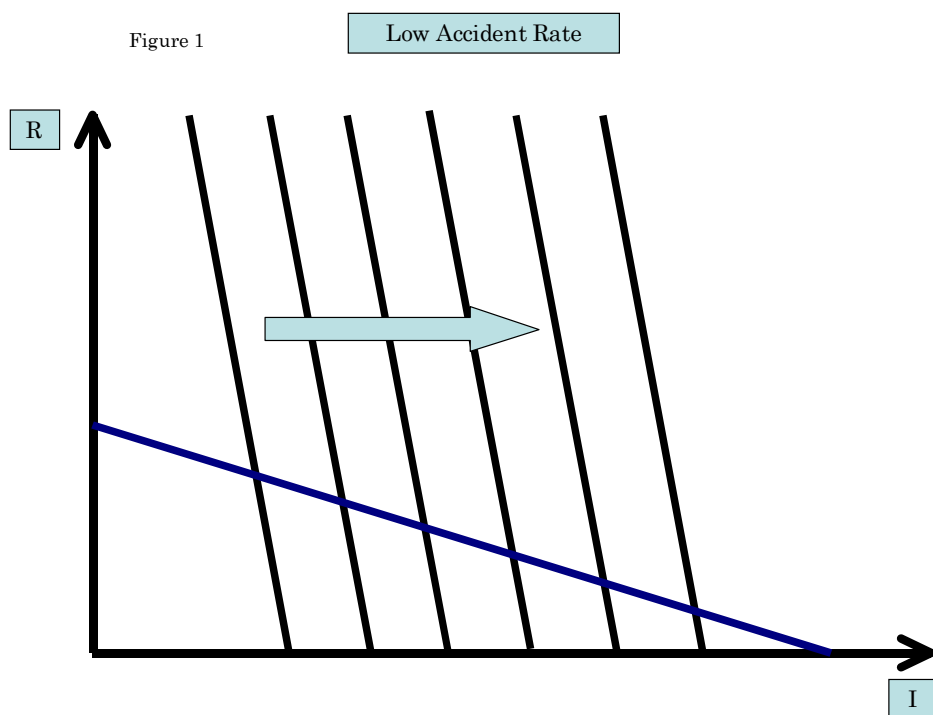
Then, if the ruling party gives up one unit of Responsibility and purchases one unit of Intervention, it will remain on the same indifference curve and have an extra budget to spend. Hence, the total utility for the ruling party can be increased, contradicting maximization.

Proposition 1.

Under the Assumption 1 and 3, if the observed accident rates by the ruling party are lower than that of the optimum accident rates, the ruling party will put the regulatory agency under control.

Proof of Proposition 1.

From the Assumption 3, the ruling party has an incentive to purchase more Intervention than those of Responsibility because the price of the unit of Intervention is cheaper than that of Responsibility. If the ruling party purchases more units of Intervention than those of Responsibility, it is efficient for the ruling party to put the regulatory agency under the control of assumption 1. Under this circumstance, the indifference curve will be figure 1.



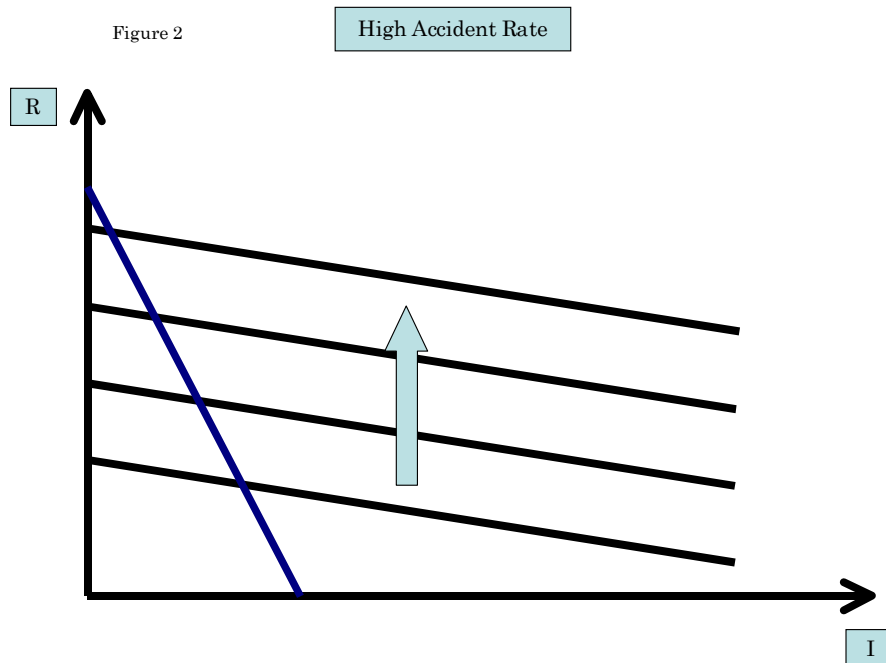
Proposition 2.

Under the Assumption 2 and 4, if the observed accident rates of the ruling party are higher than that of the optimum accident rates, the ruling party will employ the external agency for regulation.

Proof of Proposition 2.

From the Assumption 4, the ruling party has an incentive to purchase more units of Responsibility than those of Intervention because the price of a unit of Responsibility is cheaper than that of Intervention. If the ruling party purchases more units of Responsibility than those of Intervention, it is efficient for the ruling

party to employ the independent agency for regulation of assumption 2 (see figure 2).



What is important to note from these two propositions is that it is much more efficient for the ruling party to choose internal agency which Intervention could be bought cheaply, when the accident rates are low. Contrary to the result of this proposition, in case of high accident rates, the ruling party should choose an external agency in which Responsibility can be bought cheaply.

4. Empirical Case Studies

I turn now to empirical evaluation of the preceding theory by examining why the political principal selects an internal agency or an external one. According to the preceding discussion, I would like to compare Accident Rates between Japanese National Railways (Japan Railway from 1987) and British Railways (British Rail from 1993).

It is one aim of this paper to compare accident rates. Hence, it is reasonable to use accident rates and passenger casualty rates in Japan and the U.K.

Table 1-3 summaries the performance of the railway accidents in terms of 'fatal accident rates' measured in number-miles, 'passenger casualties and casualty rates' and 'train accidents and accident rates' measured in number-kilometers, which compares the U.K and Japan. Railway undertakings are required to report accidents, failures and dangerous occurrences to the Secretary of State for Transport under the Regulatory Acts affecting safety.

Table 1 Railway accidents: fatal accident rates
(number/a million mile)

Year	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
U.K	0.74	0.70	0.68	0.73	0.66	0.69	0.71	0.72	0.58	0.53	0.42	0.43	0.47
Japan	0.006	0.003	0.003	0.010	0.009	0.009	0.006	0.016	0.018	0.015	0.002	0.005	0.002

* Source: <http://www.dft.gov.uk/>

Suuzide miru tetsudo 1999-2005 (unyuseisakukenkyukiko)

Table 1 shows the fatal accident rates reported respective of whether more than 10 passenger casualties or derailments was involved. It is clear that the fatal accident rates in these two countries are remarkably different. Although the rates in the U.K have been continuously declining, the gap between them is still considerably large.

Table 2 is based on passenger casualties due to train accidents and movement accidents. The casualty figures in Table 2 are subdivided casualties resulting from train accidents and accidents by movement of railway vehicles, for example, entering of alighting from trains, opening of closed carriage doors at stations. Although both the absolute number and the death rate in Japan is higher than those in the U.K, total casualties, including injured, are far less in both absolute and relative terms.

Table 2 Railway movement accidents: passenger casualties and casualty rates
(Number/rate per billion passenger kilometers)

Year	Country	Casualty			Casualty rates		
		Deaths	Injured	All casualties	Deaths	Injured	All casualties
1982	U.K	18	1972	1990	0.6	63.6	64.2
	Japan	309	448	757	1.6	2.3	3.9
1983	U.K	27	2429	2456	0.8	69.9	70.7
	Japan	324	489	813	1.7	2.5	4.2
1984	U.K	39	2786	2825	1.1	79.9	81.0
	Japan	268	448	716	1.4	2.3	3.7
1985	U.K	31	2644	2675	0.8	71.8	72.6
	Japan	280	583	863	1.4	2.9	4.3
1986	U.K	32	2685	2717	0.9	72.0	72.9
	Japan	302	417	719	1.5	2.0	3.5
1987	U.K	39	2999	3038	1.0	75.6	76.6
	Japan	308	358	666	1.5	1.7	3.2
1988	U.K	68	3336	3404	1.7	81.4	83.1
	Japan	327	442	769	1.5	2.0	3.5
1989	U.K	31	3009	3040	0.8	75.2	76.0
	Japan	318	583	901	1.4	2.6	4.0
1990	U.K	35	2815	2850	0.9	70.8	71.7
	Japan	282	404	686	1.2	1.7	2.9
1991	U.K	30	2561	2591	0.8	66.9	67.7
	Japan	286	593	879	1.2	2.4	3.6
1992	U.K	16	2480	2496	0.4	65.5	65.9
	Japan	312	324	636	1.2	1.3	2.5

* Source: Department for Transport (1986), "Transport Statistics Great Britain, 1986 Edition", pp. 150-151, Department for Transport (1996), "Transport Statistics Great Britain, 1996 Edition", pp. 118-120. <http://www.dft.gov.uk/>

Table 3 Railway accidents: train accidents and accident rates
(Number/rate per billion passenger kilometers)

Year	Country	All accidents	Accident rates
1982	U.K	998	37.0
	Japan	1045	5.4
1983	U.K	1255	41.8
	Japan	1133	5.8
1984	U.K	1359	45.3
	Japan	980	5.0
1985	U.K	1240	41.3
	Japan	945	4.8
1986	U.K	1172	37.8
	Japan	1035	5.0
1987	U.K	1166	35.3
	Japan	927	4.4
1988	U.K	1330	39.1
	Japan	900	4.1
1989	U.K	1434	42.2
	Japan	893	4.0
1990	U.K	1283	38.9
	Japan	800	3.4
1991	U.K	960	29.1
	Japan	760	3.1
1992	U.K	1152	36.0
	Japan	706	2.8

* Source: Department for Transport (1986), "Transport Statistics Great Britain, 1986 Edition", p. 137, p. 150, Department for Transport (1996), "Transport Statistics Great Britain, 1996 Edition", p. 107, p. 118. <http://www.dft.gov.uk/>
Suuzide miru tetsudo 1999-2005 (unyuseisakukenyukiko)

Note: I calculate on accident rates based on accident number and passenger tickets.

Table 3 shows the total number of train accidents (collisions, derailments etc) reported irrespective of whether personal injury was involved. As is shown in table 1 and 2, table 3 also indicates accident rates in Japan are pretty low,

compared to that of the U.K. Moreover, these figures are highly constant. Hence, the gap in accident rates between two countries is not a temporary phenomenon.

From the tables and the fact that all tickets (the transport density) in Japan are six or seven times higher than that of the U.K, it is certain that Japan's index are extremely low comparing with that of the U.K. The ruling party confirms these facts and decides what kind of agency is appropriate to intervention and responsibility.

5. Concluding Remarks

This paper analyzed types of agency from the strategic standpoint of political principal to maximize utility especially focusing on rail accidents.

In choosing regulatory agency, the ruling party is strongly motivated by political interference and responsibility. Firstly, it observes accident rates such as 'fatal accident rates', 'passenger casualties and casualty rates' and 'train accidents and accident rates' that have been reported by Japanese National Railways and British Railways.

The indifference curve relies on optimum accident rates.

Theory also suggests that a political principal observes the effects of privatization relatively in the long term. In other words, if one simply wants to emphasize political achievements, one does not have to care about the types of organization that is newly privatized. This article attempts to reveal how one calculates the utility in rail privatization for oneself.

REFERENCES

- Dixit, Avinash K. 1996. *The Making of Economic Policy: A Transaction-Cost Politics*. The MIT Press.
- Dixit, Avinash K. 2003. "Some Lessons from Transaction-Cost Politics for Less-Developed Countries", *Economics & Politics* 15(2): 107-133.
- Epstein, David, and Sharyn O'Halloran. 1999. *Delegating Powers: A Transaction Cost Politics Approach To Policy Making Under Separate Powers*. Cambridge University Press.
- Horn, Murray J. 1995. *The Political Economy of Public Administration: Institutional Choice in the Public Sector*. Cambridge University Press.
- Huber, John D., and Nolan McCarty. 2004. "Bureaucratic Capacity, Delegation, and Political Reform." *American Political Science Review* 98(3): 481-494.
- Lewis, David E. 2003. *Presidents and the Politics of Agency Design: Political Insulation in the United States Government Bureaucracy, 1946-1997*. Stanford University Press.
- McCubbins, Mathew, Roger Noll, and Barry Weingast. 1987. "Administrative Procedures as Instruments of Political Control." *Journal of Law, Economics & Organization* 3: 243-277.
- McCubbins, Mathew, Roger Noll, and Barry Weingast. 1989. "Structure and Process, Politics and Policy: Administrative Arrangements and the Political Control of Agencies." *Virginia Law Review* 75: 431-482.
- Moe, Terry M. 1990. "The Politics of Bureaucratic Structure." In *Can the Government Govern?* eds. John E. Chubb and Paul E. Peterson. Washington: The Brookings Institution, pp. 267-329.
- Moe, Terry M. 1990. "The Politics of Structural Choice: Toward a Theory of Public Bureaucracy." In *Organization Theory: From Chester Barnard to the Present and Beyond*, ed. O. Williamson, New York: Oxford University Press, pp. 116-153.
- Nam, Kyung Tae. 2003. "Transaction-Cost Politics of Privatization: Comparing Railway Privatization in Japan and Britain [in Japanese]", *Hogakuronso* 154(1, 2, 3): 71-91, 141-161, 145-165.
- North, Douglass C. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.
- Prosser, Tony. 1997. *Law and the Regulators*. Oxford University Press.
- Shepsle, Kenneth A. 1992. "Bureaucratic Drift, Coalitional Drift, and Time Inconsistency: A Comment on Macey." *Journal of Law, Economics & Organization* 8: 111-118.
- Wood, B. Dan., and John Bohte. 2004. "Political Transaction Costs and the Politics of

Administrative Design”, *The Journal of Politics* 66(1): 176-202.

Department of Transport, <http://www.dft.gov.uk/>

Unyuseisakukenkyukiko. *Suuzide miru tetsudo* 1999-2005.

투고일자 : 2012. 05. 02

수정일자 : 2012. 06. 15

게재일자 : 2012. 06. 22

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This paper analyzed types of agency from the strategic standpoint of political principal to maximize utility especially focusing on rail accidents. In choosing regulatory agency, the ruling party is strongly motivated by political interference and responsibility. Firstly, it observes accident rates such as 'fatal accident rates', 'passenger casualties and casualty rates' and 'train accidents and accident rates' that have been reported by Japanese National Railways and British Railways. The indifference curve relies on optimum accident rates. Theory also suggests that a political principal observes the effects of privatization relatively in the long term. In other words, if one simply wants to emphasize political achievements, one does not have to care about the types of organization that is newly privatized. This article attempts to reveal how one calculates the utility in rail privatization for oneself.

Key Words: transaction-cost politics, institutional design, rail privatization