A CASE STUDY ON STANDARD-SETTING PROCESS OF MINI VEHICLES: PUBLIC–PRIVATE INTERDEPENDENCE FOR AUTOMOBILE SAFETY IN JAPAN

Yuichi MURAKAMI, M.A. (Law) The Univ. of Tokyo, Graduate Sch. of Law and Politics, Research Fellow of the Japan Society for the Promotion of Science

ABSTRACT

A mini vehicle in Japan, owing to its regulated size and its energy-saving advantages, has been exempted from certain taxes and obligations. In February 1994, a global trend of standard harmonization encouraged the government of Japan to work on a regulatory standard revision and to ask an industry union to examine the same. Mini vehicle manufacturers, on the one hand, opposed it because it appeared *technically unfeasible* to them owing to its conventional standardized size and engine displacement. On the other hand, the manufacturers of middle-sized cars and some foreign dealers opposed it for the fear that their potential customer flow would be diverted to mini vehicles, a neighbouring but tax-relieved vehicle type. After the standard is tightened, engineers in the mini vehicle industry made significant efforts and have finally accomplished it. In such a regulatory standard-setting process, public-private interdependence (collaboration) is now one of the common policy methods in Japan, especially in controlling the quality of technical standards for appropriate up-to-date regulation. This paper finds 'interdependence' in that the government, as a regulator, asks manufacturers and other research institutes for highly technical information and makes efforts to attain its policy goal—automobile safety—by means of managing the standard-setting process, utilising the mechanisms of *conflicts, competition,* and *coordination* in regulatees in the private sector. The government can take advantage of the incentives of stakeholders who are eager for standard harmonization and technology development.

Keywords: public-private collaborative governance, technical standard setting, standard harmonization, quality control of safety regulation, policy process management, mini vehicle, automobile safety

1. INTRODUCTION: RESEARCH AGENDA, PLAN, AND METHOD

While a development in transportation brings about an enormous benefit to society, it also causes risks to emerge. The government, which is constitutionally authorized to promote national safety, nominally has the primary responsibility to maintain the social order by regulating the public with *appropriate* rules and standards[1], and by seeing to it that manufacturers yield technological benefits. Thus, a drastic development in science and technology these days ironically attracts public attention to methods of 'administrative policy' on safety in transportation and other domains.

Technical information and scientific knowledge in general, which are vital to maintain the quality of regulatory standards, are constantly being produced and revised through experiments, investigations of accidents, and discussion among stakeholders in both the public and the private domains. A decisive factor in the effectiveness and trustworthiness of safety regulation is whether standards are set through the balancing process of certain values such as safety, social utility, and various other interests (Kobayakawa *et al*. 2003).

This process of technical knowledge-sharing takes place not only in the government (in a narrow sense) but also in the private sphere. We can find such public–private collaborations more obviously than ever before in the safety regulatory process of standard-setting or its implementation, where the government delegates private actors to exercise some regulatory authority (Freeman 1997, Garcia 1992). The effectiveness of collaborative tools and methods such as enrolling third parties like academic association (or 'gate-keepers'), 'invisible hand' or consumers' rational choice in the market, or a global trend of standard harmonization are intently discussed even in academia (Black 2003, for example).

In this paper, I will discuss some seemingly important issues concerning public–private collaboration and the 'division of labour' in regulatory standard-setting for automobile safety and its implementation. In chapter two, I will point out some theoretical issues extracted from existing research including [1] the importance of public–private collaborative standard-setting, [2] the characteristics of technical information and scientific knowledge, [3] rethinking the 'capture theory', and [4] the relationship between technical standard-setting and R&D. In chapter three, I will describe in detail the standard-setting process of the mini vehicle, a unique automobile category in Japan. Further, I will analyse the mini vehicle from the theoretical point of view in chapter four.

[1] As this paper looks into an automobile case from a public-administrative perspective, I use a word *appropriate* here supposing that *appropriate* regulation, for example, guides society in a favourable direction (reducing the number of deaths and injuries in traffic accidents, for example), while balancing various values (benefit/cost, technical/political feasibilities, and so on). It can be regarded as an analysis on an art or a skill for typical public managers in charge of setting regulatory standards, as traditional public administration study has focused on. However, as there must be respective *appropriateness* for each stakeholder (this is one of the eternal questions for social science studies because their *appropriateness* is likely to be tied up with interests), I am trying to describe them for each and their tradeoffs in the case study. Tradeoffs concerning mini vehicles are described in 3.2.1.(c), and see also 2.4.1.

This case study was conducted by reviewing official and unofficial written documents and newspapers (including those published by trade unions), referring to information on the Internet, participating in symposiums on automobile safety, and conducting interviews (from July 2007 to December 2009) with people in both public and private sectors, who have been concerned at various times with the standard-setting process.

2. THEORETICAL ISSUES IN ANALYSING A STANDARD-SETTING PROCESS

2.1. Public–private collaborative standard-setting

2.1.1. Standard-setting as an implementation and consensus-building process

A technical standard is set as an administrative legislation, a decision delegated in Japan by the Diet. When a Parliamentary law provides a regulatory policy or its abstract standard, in response, the administrative organizations set numerical criteria that materialize concrete regulatory technical standards for implementation. Automobile safety standards, for example, are rather minute and highly technical to be written down in Parliament law. The criteria for evaluating its safety need to be updated in order to correspond to every discovery in R&D of factors that threaten automobile safety (Nishimura 1984). Administrative organizations have to respond to the ever-changing technical situations. They have the flexibility to set and to revise appropriate technical standards according to changes in the social climate, exercising as much discretion as admitted by law (Morita 2000). Thus, technical standard-setting is regarded as one of the implementations from the legislative point of view. Since the 1980s, the implementation process has stolen the limelight as a research object in Japanese public administration study. When standard-setting is seen in this manner, the policy process in the individual ministry or department concerned must also be discussed (Takada 2002).

A standard-setting stage in a policy process proceeds among various stakeholders through the choice of multiple/incompatible values, which include those of human life, feasibility of resource restriction (of technological achievement, information, effects in return for introduced resources/costs, or social benefit), and users' acceptability (Crandall 1986). The Ministry of Land, Infrastructure, Transportation, and Tourism (MLIT), which was earlier known as the Ministry of Transport (MoT), has been in charge of automobile safety since 2001. MLIT announced national safety as its major policy goal, and it must work out how to attain that goal amidst many trade-offs, holding discussions with other ministries and departments, which also shoulder their own policy targets. Further, stakeholders such as users and manufacturers are eager to participate in the process and to express their opinions on how much the society as a whole should *pay* for automobile safety, because it contains such risks that it is a matter of probability. Thus, technical standard-setting is regarded as

one of the consensus-building processes in which various stakeholders with their own interests participate, because it is not sufficient to leave it only as an administrative discretional sphere.

In the policy process of standard-setting, the administration to which the authority is delegated has to make a final decision, taking into account expected social impacts and a width of criteria that experts believe will ultimately contribute to national safety.

2.1.2. Lesson from the U.S. experience

The public–private collaboration method has often been deployed in standard-setting processes, as observed in the U.S. (Garcia 1992). This can be translated in regulatory authority as a 'tug of war' between the public and the private. Lessons from precedent cases are summarized in the following three points.

First, as the standardization experience of warfare goods and competition in the U.S. shows, standard-setting is more likely to fail when either the public or the private monopolises the regulatory authority. The government should make an effort to handle this issue whenever the private sphere (trade unions, for example) cannot be expected to manage it (Ayres *et al.* 1992). If, on the other hand, the government intervenes too much in the process, it disturbs the 'invisible hand' in the market, and it discourages the private sphere from constructively producing something or complying with the rules. In short, history implies that the 'division of labour' between the public and the private is rather useful in setting regulatory standards.

Second, it is not always better to open the process to the public, even though this appears to go well with the idea of 'deliberative democracy'. The standard-setting process becomes 'chaos' in the spheres of technology and politics (as in the case of the U.S. Consumer Safety Commission) when it allows as many stakeholders as possible to participate. Stakeholders who are potentially in conflict regarding both technical and political issues may stick to various interests and values such as the protection and promotion of domestic industry, technology advancement, market competition, or the value of human life. Thus, it is necessary to design *smart* rules regarding 'when', 'who', and 'how' to allow stakeholders to participate in the standard-setting process (Shiroyama 2006a).

Third, standard-setting management is also important as an industrial strategy. The U.S. has been very unsuccessful in designing a standard-setting process that almost half of all U.S. exports are forced to be subject to European standards. Modern society, dependant on drastically developing technology, requests the States to make their own standards in order to reduce uncertainty in carrying out their industrial policy. The U.S. is considered to be rather overdue as regards determining their own standards.

2.2. The characteristics of technical information and scientific knowledge

Technical information and scientific knowledge, as administrative resources for setting regulatory standards, have the unique qualities discussed below. This is why public–private interdependency, regarded as an intermediate form of relationship between contract and philanthropy, is rather complicated (Donahue *et al.* 2006).

2.2.1. Quantitative aspect

Unlike when exchanging personnel or financial resources through contracts, technical information or scientific knowledge is generally difficult to grasp quantitatively. For this reason, we have to examine the outcome or success of the policy later in order to see whether the contractual partner offered an *appropriate* information resource. To make matters worse, the criteria to assess the outcomes of policies are not definite, regardless of whether they end in success or failure.

2.2.2. Qualitative aspect

It is also difficult to seize such information qualitatively. Technical information or scientific knowledge, particularly at the interface of scientific technology and public policy, is produced and revised by engineers or scientists, and 'scientific' knowledge does not always exist as 'the truth'. It is difficult to judge whether the information is good for regulatory use at any given time because the criteria is also fluid. Bureaucrat is said to have considerable expectations on 'scientific knowledge' (Fujigaki 2003). Technical information or scientific knowledge contains some uncertainty; it is expected to be feasible in some years but this cannot be assured. Moreover, actors who potentially provide the administrative partner with useful information do not always *appropriately* furnish it on the basis of their rational calculation.

In addition, technical information or scientific knowledge is often accompanied by relatively rigid evidence of experimental data. This scientific methodological expertise can strengthen its persuasiveness for those who receive the information (government or competing manufacturers) (Stone 1989). It is necessary to note that there are times when information providers arbitrarily translate and select evidences in favour of their interests.

2.2.3. Availability in the global harmonization trend

The government can refer to technological trends overseas if there is a precedent case of safety regulation. It can infer whether domestic manufacturers can realize the necessary techniques without spending other resources on performing other technical experiments. This can be translated as 'division of labour' among countries for the production of technical

information and scientific knowledge for *appropriate* regulation. The government can also use the information to persuade manufacturers negative toward standard-revision to work hard to catch up with the demanded technical level. Another problem is whether the government has the resources or ability to notice and procure the information. However, the government can grant public/private research institutes the ability to produce such information.

2.2.4. How to deal with economically rational behaviours of regulatees

Auto manufacturers, information producers/providers, and regulatees are likely to have an incentive to provide technical information in favour of their interests (easily realized techniques, for example) to regulators, if the information is directly referred to for establishing regulatory rules and standards. Regulatory standards created from such information cannot have a good impact on safety and other policy goals, and may destroy the public trust about regulation per se because of the 'capture (the regulatory standard is set in favour of the regulatee)'.

Moreover, it is difficult for the government to gain appropriate information about successes/failures in R&D because it can constitute trade secrets under strict competitive market among manufacturers. It is true that information is sometimes qualitatively difficult to grasp, as mentioned above (2.2.2.), but the government needs to be smarter when designing a regulatory process (Lessig 1999) in order to procure *appropriate* information for standard-setting, taking the incentive structure in the private domain into profound consideration.

2.3. Rethinking 'capture theory'

This case study is also motivated by fundamental questions about 'capture theory', in which there are some variations (Stone 1982).

2.3.1. Political usurpation of regulation

Manufacturers are much more likely than consumers are to organize themselves and to mobilize their political power over politicians, general authority, or agencies in order to force those entities to make regulations in their favour (Stiglar 1971, cf. Hood *et al*. 2001). However, is it rather reasonable to imagine this 'agency capture' phenomenon even when there are numerous regulatees and their respective interests are often in conflict with each other? As for automobile regulation, interest in automobile safety is not always very common among manufacturers who are opposed to policy goals.

Stakeholders also exist overseas. This problem implies the necessity to clarify through case studies, by analyzing stakeholders' recognition of problems and behavioural principals,

the question of 'who' in the private domain asserts, 'what' and 'how' in public/private interdependence.

2.3.2. Regulatory life cycle

An agency that was established in response to a temporal political demand can gradually lose its raison d'être as time goes by, and may learn to compromise in some way or another with regulatees or the industry in the end. However, are regulatory agencies under Parliament delegation so easily affected by regulatees that they are not innovative with regard to self-organization/innovation? Agencies with a 'noble' goal may try to adapt to environmental changes by designing and exercising their discretion, by learning, and by changing their policy tools so as not to be unfairly captured by the regulatees. This question implies the need to analyse such a case from the viewpoint of how the regulator (agency or government) makes efforts to alter/innovate their organization, behaviour, and policy process in public/private interdependence. It is meaningful to analyse changes in the standard-setting process in three ways: environmental change outside the administrative organization, the organization per se, and factors of exogenous control of the organization (Tanabe 1993). Changes in political process and the forum of decision-making can be described in terms of its focus, formality, duration, and stability (Donahue *et al.* 2006).

2.3.3. Regulator's economically rational behaviour

The chief of a regulatory agency, who is also a member of the policy network, is likely to use his authority to maximize his own benefits. However, is it most likely for him to use his authority even in a policy process filled with conflicts of interest, where the authority of the agency extends to various political fields such as environment, trade, and safety? This question implies the need, when analyzing the regulatory process, to keep an eye on the organizational relationships in the public domain of organizations that are sharing their authorities and competing with each other. A thorough case study on the management process among related departments in the government still remains to be done after the preceding case studies (Morita 1988).

2.4. The relationship between technical standard-setting and R&D

2.4.1. Porter's theory

What exactly is an *appropriate* regulatory standard that contributes to the *public good*? Concretely, it is a standard of safety and environmental regulation, for example at the interface of scientific technology and public policy, that demands from the public a certain level of *appropriateness* and a balance of various values and trade-offs, realizing 'technology

forcing'[2] that has been discussed (Porter *et al.* 1999). An *appropriate* technical standard, even if it forces some regulatees to obey without any consensus, which is not necessarily technically infeasible but provides better solutions to existing technological problems by urging regulatees or manufacturers to make courageous experiments, improves the technical achievement level as a whole. If so, the government or agency, as a delegated regulatory organization, can play a unique role in public–private collaboration for public management, in which the government 'guides' private actors in a certain direction by providing some kind of incentive such as grants. This is very different from normal private organizational relationships.

A good example of this phenomenon is the Clean Air (or 'Muskie') Act of 1970, which compelled Honda to come out with the Civic CVCC (Shiroyama 2000, Shiroyama 2006b). In this case, a 'Technical Committee', an information-sharing regime constituting representatives from the government and auto manufacturers, promoted competition for technical advancement among auto companies that were for and against environmental regulation (Shiroyama 2005).

In the case of the Partnership for a New Generation of Vehicles (PNGV), the government admitted carry-overs of manufacturers' leading technical development in order to provide them incentives to make efforts in R&D. The regulators set innovative regulations and permitted manufacturers to make up for other technically difficult parts that stay below the standard, if the manufacturer had carry-overs in other automobile types or parts that easily meet the innovative standards, guiding manufacturers to buy better parts from affiliated subcontractors (Dunn 2000). This can be evaluated as a meaningful method of public–private collaboration for feasible public management.

In order to design regulatory institutions and standards in which public–private collaborative governance stays secure, it is effective for regulators to look for win-win solutions such as reducing the number of traffic fatalities (for the regulator) and improving technological innovation (for the regulatees), while paying attention to an incentive structure in both the public/private domains.

2.4.2. Providing incentives to R&D in the private sector

In the case study, attention must be paid to behavioural changes in actors as time and the process go by. In order to shake off other competing manufacturers, a manufacturer who is forced to obey the regulatory standards at one time may become more likely to set a stricter regulation once it understands the prospect of meeting the technical standards with its attainable technology and payable costs. This can be translated as a form of 'capture'.

[2] Setting standards of pollution, for example, called for in environmental regulations for which existing technologies are inadequate and therefore require technical advancements to achieve.

In this case study, I try to describe a standard-setting process of mini vehicles in order to address the questions of 'who' forced 'whom' to do 'what', 'how' each decision was in favour of 'who' at each policy stage, and 'whom' it benefited in the end.

3. CASE STUDY: STANDARD-SETTING PROCESS OF MINI VEHICLES

3.1 Mini vehicles: Characteristics and preferential treatment

Mini vehicles, light motor vehicles, and K-cars are defined in Japan as vehicles with a length of less than 340cm, a height of less than 200cm, a width of less than 148cm, and an exhaust volume of less than 660cc. In exchange for the mini vehicle's regulated size and its advantages for society (such as energy-, resource-, and space-saving, as well as reduced damage to road infrastructures, reduced exhaustion of CO_2 and other wastes, and convenience for elderly people in rural areas without rail traffic), the government has reduced taxes on such vehicles by 66~80%.

Mini vehicles first came out in July 1949 with a length of less than in 280cm, a width of less than 100cm, a height of less than 200cm, and an exhaust volume of less than 150cc. The standard has gradually been widened to the present one in order to improve the vehicles' horsepower after installing air conditioners, and to deal with newly emerging regulations on car exhaust, extension of highways, and social needs. (These issues seem to be politically linked with a discussion of its tax increase, which is difficult for me to distinguish them from its technological improvements though.)

The government has institutionally been in favour of mini vehicles in return for their regulated small size. Their consumption tax and automobile acquisition tax are suppressed to about 34% of that of normal cars with an exhaust volume of 2000cc. Tax on automobile weight is suppressed to about 20%. Insurance premiums on automobile liability are about 60% when used for nine years. Toll fee on highways is discounted *to* about 80%. Official registration, parking certification, and garage reports (owners' duty to write a report where to park his/her car, and to hand it to the ministry) are unnecessary in rural areas. These treatments seem to be justified by mini vehicles' small contribution to social loss. Mini vehicles are so energy-, resource-, and space-saving[3] that they reduce social losses such as CO_2 emission, damages to infrastructures such as roads and bridges[4], parking space occupancy, and wastes. Mini vehicles, as a form of personal mobility, have been treated as a leader in the field of motorization.

[3] They run 17.7km per litre of petrol (versus 12.8km per litre for ordinary cars), and weigh about 868kg (versus 1423kg for ordinary cars).
[4] It is calculated to be 1/7 the amount of damage caused by ordinary cars.

The lower cost of purchasing and maintaining mini vehicles has attracted more and more users, and there are now 28.17 million K-cars (35.7% of all cars) in use in Japan (March 2009, MLIT web page). Approximately 60% of all mini vehicles are possessed by people in rural areas (smaller cities and towns with a population of less than 10 million). They often replace railway service, as mini vehicles are more popular in prefectures with shorter rail tracks. Elderly drivers of mini vehicles have increased more than three times in the past twelve years (Japan Mini Vehicles Association web page). All of these facts justify the preferential treatment of mini vehicles mentioned above.

3.2 Outline of the standard-setting process of mini vehicles

3.2.1. 'Agenda setting'

(a) Endogenous Factors

In 1988, the number of people who died in traffic accidents in Japan exceeded ten thousand, the shock of which caused MoT to ask its consultation committee to seek technical solutions for automobile safety. It aimed at strengthening safety regulations on automobile structures, parts, and equipment in order to deal with pre-crash and post-crash situations and to reduce injury to passengers. The committee replied to the consultation in 1992 after conducting interviews with manufacturers, users, and other specialists, paying attention to investigation results on traffic accidents, automobile development, international trends, environmental issues, and saving resources and energy (Japan Mini Vehicles Association 2007).

MoT, responding to the committees' answer, revised regulations on road transportation vehicles in 1993 in order to strengthen them. The new regulations, enacted in April 1994, required automobiles at the speed of 50 km/h, which were larger than small-sized to have a firm body in order to ensure passengers' safety in crashes. Mini vehicles, however, were exempted for a while from the strict standards, following a '40 km/h standard' instead; it was thought to be technically infeasible for mini vehicles to observe the '50 km/h standard' because of the difficulty of providing space for saving lives and absorbing the shock of a crash. MoT aimed at strengthening the regulations on mini vehicles as those vehicles developed technically.

Nevertheless, in February 1994, the consultation committee announced that the '50km/h standard' should be applied to mini vehicles as soon as possible. The then Minister of Transportation directed MoT and the Japan Automobile Manufacturers Association (JAMA) to examine how to improve mini vehicle safety, and to prepare for standard-revision on mini vehicles. MoT, the Police Agency, the Ministry of Finance, and the Ministry of Local Autonomy began to discuss how to treat mini vehicles within the overall institution.

(b) Exogenous factors

Safety regulations against crashes were tightened, partly because of the trend of the international harmonization of technical standards.

Governments that adopt automobile attestation systems give type authorization to manufacturers through a procedure that takes place in an individual country, according to its own safety and environmental needs. If governments whose countries trade cars and car parts with each other make an agreement that when an automobile type is certified to meet common technical standards, other member countries need not ask manufacturers to report the type in each procedure from the beginning, they can thereby omit a troublesome repetition of the certification process. United automobile design, sharing parts, and a decrease in R&D costs can also be beneficial for global manufacturers, and will contribute to the further globalization of automobiles.

For this reason, European countries concluded a multilateral agreement on the mutual recognition of automobile attestation ('1958 Agreement') at the Economic Commission for Europe (UN/ECOSOC/ECE). In order to catch up with the rising international automobile trade, ECE opened the agreement to United Nations member states outside of Europe, and Japan joined in November 1998. Signatories of the agreement approve mutual attestations on automobiles and their parts that meet the technical standards of the ECE rules. The rules are discussed and decided upon in WG29 and its subcommittees in the ECE.

Table 1 – Safety regulatory standards against crashes (data retrieved from the Society of Automotive Engineers of Japan, Inc. (revised))

		Frontal Crash		*Side Crash*	
		full overlap	*offset*	*27 degrees*	*90 degrees*
US	*FMVSS*	*48 km/h(1986-)*		*54 km/h(1993-)*	
	NCAP (the gov.)	*56 km/h(1979-)*		*62 km/h(1997-)*	
	IIHS (insurance)		*64 km/h(1996-)*		
Europe	*EC regulation*		*56 km/h(1998-)*		*50 km/h(1998-)*
	EURO-NCAP (the gov.)		*64 km/h(1996-)*		*50 km/h(1995-)*
Australia	*NCAP (the gov.)*	*56 km/h(1999-)*	*64 km/h(1999-)*		
Japan	*Safety regulation*	*50 km/h(1994-)*	*50 km/h(2005-)*		*50 km/h(1998-)*
	JNCAP (the gov.)	*55 km/h(1996-)*	*64 km/h(2001-)*		*55 km/h(2001-)*

The then Minister of Transportation consulted the Council for Transport Technology in November 1996; the Council then released a document called 'Strategy for globalization concerning automobile standards and the attestation system' in June 1997, after holding some working groups. The Council advised that the government should work hard to promote the international harmonization of technical standards, introducing mutual approval of attestation, international cooperation in automobile technology in developing countries, and global collaboration in automobile maintenance and inspection, in order to follow the trend of the globalization of automobiles.

(c) Trade-offs on mini vehicles

It is true that mini vehicles have the shortcoming of a weak body, but this has been socially accepted as a characteristic that their users have to put up with in return for the cars' lightweight. The idea of regulating mini vehicles as strictly as other cars was quite epoch-making. Some manufacturers said that regulators should continue to impose the '40km/h standard' on mini vehicles, while many others asserted that mini vehicles should not be as well-treated as other categories because the '50km/h standard' was going to be imposed even on imported cars.

The opinions of mini vehicle manufacturers were not necessarily all the same. The regulatory revisions were likely to cause manufacturers higher R&D costs and a risk of reduction in sales, in response to the cars' increasing price. Some manufacturers thought that they could achieve their Corporate Social Responsibility (CSR) by manufacturing safe automobiles, removing the stigma of the cars' weakness, and that they could invade the neighbouring market of small- and mid-sized cars (Suzuki 2009). Thus, mini car manufacturers had both positive and negative opinions of regulatory revisions, depending on their costs and benefits.

It is necessary to be aware of the trade-offs that the regulatory revision of mini vehicles is likely to yield. First, cheap mini vehicles may become more expensive because of their improvement in equipment for automobile safety. Secondly, light mini vehicles may become more energy-consuming because the addition of safety equipment makes them heavier. Thirdly, passenger space in mini vehicles may get narrower because the cars' bodies are built thicker. Fourthly, mini vehicle figures may become uniform in order to deal with safety under strict regulations. Fifthly, mini vehicles may become difficult to drive if they get larger. Finally, mini vehicles may be more prioritized than other cars if they become similar to the small-sized cars that do not enjoy preferential treatment in terms of taxes and so on. Is it still possible to justify the priority of mini vehicles?

This paper will now describe the regulatory revision process of mini vehicles that was designed to deal with the drastic increase of traffic fatalities and the international harmonization of technical standards.

3.2.2. The process of regulatory revision

(a) Battles among manufacturers and their tentative agreement

On 14 April 1994, in response to the consultation with MoT, an ad hoc committee for mini vehicles in JAMA concluded that it was *technically infeasible* to impose the stricter '50km/h standard' on mini vehicles with a length of 330cm, a width of 140cm, a height of 200cm, and an engine displacement of 660cc. The committee added that mini vehicles needed to extend by 15cm in length and 5cm in width, and to enhance the engine displacement to nearly 800cc, in order to meet safety regulations (mini vehicle manufacturers exported automobiles with displacements of 800cc at the time).

MoT announced that it would extend the mini vehicle standards according to the examination by JAMA, but that, at the same time, the standards should not be revised so drastically that the distinction between mini vehicles and small-sized cars would lose its raison d'être, as it might if their standards became too similar. Manufacturers of small-sized cars (with an engine displacement of 1000-1300cc) examined the regulatory climate very carefully because a large standard revision would promote mini vehicles, which are favourably treated in taxes etc., to invade the realm of small-sized cars.

Table 2 – Comparing mini vehicles and similar small-sized cars (An example)

	Mini vehicles	*Small-sized cars*
		
Engine displacement (cc)	*658*	*996*
Price (yen)	*819,000*	*1050,000*
Mileage (distance for 1 litre)	*23.5*	*22.0*
Automobile tax (yen)	*64,800*	*355,500*
Premium on compulsory insurance (yen)	*88,500*	*121,300*

On 25 April 1994, it was reported that six mini vehicle manufacturers planned to propose a standard-revision plan (340cm in length, 150cm in width, and 770cc in engine displacement) in May, and that MoT was likely to admit the proposal after discussions with other manufacturers.

Auto manufacturers as a whole decided to make a concrete plan because they thought it necessary to talk over what to do about the existing distinction between mini vehicles and small-sized cars and about mini vehicles' favourable treatment. JAMA began holding both formal and informal hearings on manufacturers of mini vehicles and other cars, and decided to examine revision plans within its standing committee. The chairman of the ad hoc committee for mini vehicles in JAMA announced that they were seeking *appropriate* standards *purely technically*.

Mini vehicle manufacturers, accepting the opinions of the JAMA committee on safety, environment, and technology offered a concession plan containing the following three points: [1] extending mini vehicles by 10 cm in length, [2] deciding how long to extend them in width after a regulatory standard against side-collision is set, [3] rethinking enhancement of engine displacement.

Manufacturers of small-sized cars persisted in making 'dual standards', that is, an extension of 10 cm in length only in the minivan type of vehicle (only 4 cm for other mini vehicles) because the bonnet type was assumed to be strong enough to meet the standard. MoT refused the proposal because it did not distinguish among those models according to whether they met the standard or not.

In the end, manufacturers did not reach a decision in the standing committee. A temporal committee in JAMA concluded on 19 July that they should agree to extend mini length by

10cm, with an attached opinion that it would possible to meet the standard even with an extension of only 4cm, depending on the car type.

(b) Requests for MoT

On 5 August, JAMA requested that the Automobile Bureau of MoT revise the mini vehicle standards as little as possible, because it was impossible to attain the new safety regulation at the mini's conventional size. The request contained the following conditions:

1. It seems necessary to extend mini vehicles' length by 100mm in total (or 170 mm for cab-overs and 0–40 mm for bonnets) to deal with frontal crashes. The government should set standards for each automobile category, such as cab-overs and bonnets.
2. The government should set, as soon as possible, a safety regulation against side crashes, because the mini's width extension depends on whether or not we are to deal with American standards (50–70 mm) or those of Europe (less than 50 mm).
3. No revision is needed in engine displacement (660 cc) because an increase in weight can be obtained through improving the engine, lightening the weight of parts, and other technology developments.

The Automobile Bureau began work on the technical standard revision of mini vehicles in response to the request from JAMA. The Bureau implied that the government would make a decision by itself, though it would refer to the JAMA request. MoT took over the final part of decision-making that was not entirely resolved within the industry.

(c) Technical hearings and examination

MoT decided in August 1994 to conduct interviews about mini vehicle standard revision with all related manufacturers and other stakeholders. From September to December, MoT heard the opinions of auto manufacturers, dealers, industry unions, users (the Japan Automobile Federation), and other parties. Manufacturers in Europe had been against the size extension because it would result in excluding European cars from the Japanese market, as they did not qualify for tax reductions and other favourable treatment because of their large engine displacement. As MoT had been in need of regulatory information as to the technical feasibility for standard revision, technical hearings enabled MoT to make much of the information obtained from the private sphere.

The standard revision had a rough voyage through January 1995: a regulatory trend for automobile safety, to which MoT had to refer, was on uncertain ground in Europe, and the revision was combined with the political and institutional issues of the deregulation of mini vehicles.

(d) Relationship with other ministries concerned

Institutions related to automobiles extend, even now, to taxes, traffic, police, safety, environment, and energy security. Some people even say that automobiles are made of rules

and standards. The standard revision of mini vehicles has thereby caused some disputes with related ministries that are in charge of the issues stated above.

The garage report of mini vehicles is one of the most contentious issues. During the process of standard revision (in September 1994), the National Police Agency (NPA) decided to impose a duty of garage reports, even on mini vehicle owners, in major cities with populations of more than a million, for the purpose of reducing illegal parking (the previous regulation only applied to central Tokyo and Osaka). The Ministry of Economy, Trade, and Industry (METI) asked NPA to take on the duty with interim measures, which MoT and mini vehicle manufacturers agreed to do for fear that the drastic obligation would seriously affect the market. In November 1994, NPA made a final decision to extend the duty of garage reports in 2001, but only to mini vehicle owners in cities with populations of more than 3 million, and agreed to tighten the regulation gradually in the near future. At present, mini vehicle owners in cities with a million people or more are obligated to report their garage to the police. In November 1995, when the deregulation of mini vehicles was put in practice, MoT and NPA announced that they would simplify the procedures of garage reports beginning in January 1996, in order to make things easier for owners and to promote more efficient cooperation between licence delivery by the police and mini vehicle inspection. Moreover, NPA announced that it would allow the sending of garage reports by mail, a move that was welcomed by mini vehicle manufacturers.

This issue had also been discussed by MoT and NPA in 1990, when the regulations on the length and engine displacement of mini vehicles were lessened. Although the width was left untouched, contrary to mini vehicle manufacturers' expectation, NPA strengthened mini vehicle owners' obligation for legal parking (for example, garage reports) because NPA judged that illegal parking obstructed the smooth flow of traffic after the standard revision. NPA has long been interested in the causal relationships between parking problems on streets, technical improvements of mini vehicles, and those vehicles' rise in the market. It can be said that a technically unavoidable standard expansion (that is, deregulation of the mini vehicle industry) was balanced by the regulation of garage reports on mini vehicles, through the process of inter-ministry discussion.

(e) Final procedures

An agreement on 'Technical Barriers to Trade (TBT)' demands that domestic standard decisions, concerning manufacturing products and agricultural commodities, should be based on international standards and should be transparent about the standard-setting, evaluation, and certification processes that might cause trouble in international trade. A government within the agreement that plans to revise standards or evaluation/certification processes must inform the WTO secretariat before its final decision so that it may gather any opinions from the member countries (agreement 2.9). After the declaration, MoT did not receive any opposition to its safety regulatory standard revision, including that of mini vehicles.

Another proposal by the EU about side crashes was acknowledged at the ministerial meeting in Europe in August 1995. There was a trend in Japan toward the adoption of European regulations against side crashes. Manufacturers were activated in correspondence with the decision in Europe.

In September, the Technical Planning Division in the Automobile Bureau commented that it was heading toward a final decision about whether examinations for regulatory inspection could be executed in the European way even in Japan, and about the problem of reproducibility, i.e. whether the car in the examination represents the characteristics of the entire model. The Division made effort to collect results of the survey with piles of technical data to make a final decision.

(f) Decision-making on standard revision and its announcement

On 12 October 1995, the Automobile Bureau released a document called 'Improvement of automobiles against crashes' to manufacturers. It contained the following stipulations.

1. Regulations against frontal crashes (for mini vehicles) are tightened and those against side crashes (for all automobiles) are newly set. Regulators must test frontal crashes by crashing a mini vehicle at 50 km/h into a concrete wall, with a dummy in the car. Mini vehicles are newly added under the regulation, and the examination speed is increased from 40 to 50 km/h. Regulators must test side-impact crashes by crashing a truck of 950 kg into the side of a mini vehicle with a dummy in it, at a speed of 50 km/h. This reflects the European method, as Japan has been developing it since the latter half of the 1980s in cooperation with Europe. The regulatory requirement for preventing fuel leakage in case of a rear crash is strengthened at the same time. Mini vehicles were not strong enough to prevent this at the speed of more than 35–38 km/h because of their limited size, but it is assumed that mini vehicles can now deal with it at a speed of 50 km/h.
2. Regulators have revised the mini vehicle standards. Tightened safety regulations on mini vehicles have caused them to expand to the regulated maximum size, with the length increased by 10 cm to 340 cm, and the width by 8 cm to 148 cm. The engine displacement was left at 660 cc. Regulators tried to make as small a revision as possible, as was requested by small-sized-car manufacturers. The conclusion is within the range of requests that JAMA submitted (in August 1994) in the standard revision process (see (b)).

MoT heard from mini vehicle manufacturers that they were eager for much more expansion of width because it was difficult to observe the safety regulations with only an 8 cm expansion, and because good mileage, which is a strong point of mini vehicles, would be lost owing to the increase in weight caused by its unredeemed engine displacement.

Mini vehicle manufacturers made a desperate technological development, remodelling automobiles, to overcome the 'trilemma' of weight increase owing to size expansion, mileage deterioration for untouched engine displacement, and cost increase with the addition of

safety equipment. One engineer mentioned that engineers have always agreed to strive for safe automobiles, but that regulations, 'severe trials from heaven', forced them to work hard on research and development. This can be translated as 'technology forcing'. On the other hand, neighbouring small-sized-car manufacturers made efforts to develop their small-sized cars, which sell for one million yen, with mileage as good as that of mini vehicles.

The revised standard was put into practice on 30 September 1995. The Japan Mini Vehicles Association, an industry union of mini vehicles, expressed its expectation that the strict regulations would wipe out the conventional label of mini vehicles as dangerous.

(g) Putting the new standard into force

Mini vehicle manufacturers sent an application to the then Minister of Transportation detailing their plan for a new type of automobile, which were acknowledged. The number of applied automobiles amounted to 36, including 29 passenger cars, which corresponded to 40% of all types of mini vehicles in use. Regulators permitted mini vehicles that did not meet the new standards to continue to sell until June 2000.

According to data provided by the Japan Mini Vehicles Association, about 103,000 mini vehicles under the conventional standard sold in May 1998, just before the revision, a 5.6% decrease from the previous year. It is assumed that this occurred because, during the economic depression, manufacturers refrained from releasing new cars into the market before the revision, and because users avoided purchasing new ones that were safer. Although consumers naturally reacted by putting off buying conventional cars before the revision and took steps toward getting new ones after the revision, a considerably urgent demand was observed because some people rushed to buy mini vehicles under the old standard before the price rose. Manufacturers, employing a business strategy, sold them as 'affordable cars'. For this reason, manufacturers wonder whether consumers place real value on automobile safety[5].

3.2.3. Outcome of the revised standard

Has the initial policy goal been achieved by the new regulations against car crashes and the revised standard of mini vehicles? This question is closely linked with the evaluation of appropriateness, effectiveness and efficiency of public–private interdependence. According to data below from the Institute for Traffic Accident Research and Data Analysis (ITARDA), it

[5] The fact implies another interesting question to be examined; why some consumers would not buy safer cars? Viscusi & Aldy (2003) point out that the value of statistical life for prime-aged workers, for example, has a median value of about $7 million in the U.S., though the tradeoff estimates may vary significantly across studies. As the difference in prices of new mini vehicles and the conventionals is no more than $2 thousand, some other factors appear to have had effects on drivers' risk premiums. It may have something to do with their usage (some mini vehicle drivers are content only with everyday use in their neighbourhood), but it remains to be solved.

seems that the policy goal was attained, when mini vehicles under the old standards and those under the new ones are compared.

	mini vehicles under the old standards	those under the new ones
The mortality rate	0.17%	0.06%
The injury rate	2.22%	1.35%
The fatality rate	0.37%	0.15%

In 1999, MoT (now MLIT) set up a policy target to decrease the yearly death toll by 1200 before 2010 using policies for automobile safety. These policies include setting and enforcing tighter safety regulations against frontal/side crashes based on the investigation results of past accidents; providing official information about automobile safety assessments to consumers; and promoting the R&D of advanced safe vehicles (ASV). This enabled MLIT to achieve the target five years earlier than expected, and MLIT established a new policy goal to reduce the death toll by another 750 before 2010. Preventive measures for automobile safety (which is popularly called 'active safety') were immediately put into practice in collaboration with auto manufacturers, the academic community, and the government.

3.3 Changes in the standard-setting process in an age of international harmonization

Since then, the government of Japan has fairly institutionalised an automobile safety standard-setting process in which various stakeholders take part and which is more open to the public. Standards have become more detailed and broader under pressure from both inside and outside of Japan to harmonize standards and tighten safety regulation. Regulators cannot proceed without referring to more technically specialized information, and without realizing the need to coordinate the respective interests of stakeholders relevant to the standard. The government, as a regulator, therefore asks manufacturers and other research institutes for highly technical information.

4. CONCLUSION AND IMPLICATIONS

4.1. Concluding remarks

In this paper, I described public–private interdependence, or collaboration, within the automobile regulatory standard-setting process in Japan. I analysed this subject from the viewpoint of public management, which is quite different from the conventional analytical perspective of political pluralism.

Governments nowadays run short of resources – including human and financial resources, authority, and information – for public administration. However, endogenous and

exogenous factors require the government to work harder than ever before, and to be more responsive to what its people want. Due to this situation, public–private interdependence, or collaboration, is now one of the common policy methods in Japan, particularly in controlling the quality of technical standards for appropriate, up-to-date regulations.

In order to control the quality of technical information and to set an appropriate regulatory standard, the government as a regulator asks industry unions or manufacturers to produce scientific knowledge with their abundant R&D equipment, in order to gather information from traffic accident records and regulatory cases in Japan and overseas. The government also depends somewhat on discussions among manufacturers to adjust their interests, and makes efforts on its own to confirm its appropriateness at its national research institute.

Peer reviews of regulatory scientific information among engineers from competing manufacturers in working groups of industry unions *work* because of the characteristics of technical information and scientific knowledge; that is, it is difficult to evaluate the appropriateness of such knowledge in both a qualitative and quantitative sense (see 2.2.). Manufacturers have a tendency to release technical information in favour of their interests, accompanied by reasonable data. Thus, the government has to rely, to some extent, on industry unions to select appropriate technical information.

Still, the government has the authority to make final decisions regarding regulation, and to put those decisions into practice in order to guide society in the desired direction (this could be consistent with Osborne 2010. See also Murakami *et al.* 2010). In the standard-setting process, leading companies have forced conservative manufacturers to innovate. This ended up enhancing the quality of mini vehicles, resulting in a decrease of deaths caused by traffic accidents.

If we pay attention to the behavioural changes of the actors as the process went by, a manufacturer that was forced to obey strict regulatory standards at one time became more positive about setting regulations once it saw the prospect of meeting the technical standard with attainable technology and payable costs. This manufacturer seems to have tried to shake off other competing manufacturers, which can be translated as a form of ‘capture’.

However, the government still maintains the authority to use discretion when making final decisions and managing the standard-setting process while trying to govern (or mata-govern (Sørensen & Torfing 2009)) the process for the following reasons. [1] The regulatory process will not be captured by major companies and [2] the revised technical standard will provide further incentives for R&D in Japan to improve the quality of automobiles as a whole. The government, more as a ‘steerer’ than as a ‘rower’ (Osborne *et al.* 1992), tries hard to attain its policy goal, automobile safety, by means of managing standard-setting process, making use of the mechanisms of conflict, competition, and coordination in the private sector. The government can take advantage of the incentives of stakeholders who are eager for standard harmonization and technology development.

This is a relatively concrete observation of the ‘division of labour’ and a policy method of ‘technology forcing’ by the government by means of regulation. This consideration provides further evidence to refine the traditional ‘capture theory’.

4.2. Unresolved questions

In this paper, I conducted a case study of the technical standard-setting process in Japan as a typical example of public–private interdependence. However, this is only one example of public–private interdependence; thus, my conclusion merely implies a temporal consideration and does not set up a general theory. It is left to further studies to prove the theory of the public–private interdependence empirically by means of more case studies on other policies, which can be done by comparing those case studies with each other, extracting unique points, and observing common factors. In order to assess public–private collaboration for public management, it is necessary to search for the conditions under which it results in success or failure, also comparing it with the historical significance of traditional tools of 'administrative guidance (gyosei-shido)' in Japan (Shindo 1992).

Svenson (1984) implies that it depends, to some extent, on whether the value of safety is appreciated in the market whether to be successful in attaining the policy goal of national safety (see also Shapiro *et al.* 1998). These days, it looks as though the value of safety is becoming highly valued in the market in Japan. Some of the issues that I intend to study in the future are the relationship between the safety regulatory standard and the market (economically rational choice of users, etc.), the effect of technical standard-setting on the social economy, and the forms of government policy methods in response to recognized social risks.

An analysis of causal relationships between the policy outcome and the method (such as one-sided regulation, regulatory negotiation, public–private collaboration, self-regulation, and so on) is left to be conducted in the future. There can theoretically be various techniques besides those observed in previous studies of regulation (e.g. Ayres *et al.* 1992, Parker 2002, Coglianese 2003, Harada 2007). What is an *appropriate* method to manage society under circumstances in which administrative resources are limited, and in which administrative needs continue to rise? It would be meaningful to search for the condition under which self-regulation works.

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ACKNOWLEDGEMENTS

I would like to thank all the anonymous interviewees, reviewers, my mentor Professor Shiroyama (the University of Tokyo), and other faculty members for their sincere cooperation and valuable advice.

I would also like to thank the Japan Society for the Promotion of Science (JSPS) in the Ministry of Education, Culture, Sports, Science and Technology (MEXT) for a Grant-in-Aid for JSPS Fellows, and the University of Tokyo for a grant for doctoral course students.

However, please note that I, the writer, own responsibility for all the information in this paper.