

A Game-Theoretic Explanation on Legislative Inefficiency in Korea

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Legislative inefficiency, which is being magnified in Korea, is phenomenologically characterized by two noticeable features: (i) rapid increase of the number of bills introduced by the government in the narrow sense and (ii) sharp decline of the approval rate by the legislature during the same period. Based on this observation, we examine the role of incomplete information in the revelation of legislative inefficiency through a standard signaling game. We might understand legislative inefficiency as a shift to a Semi-separating equilibrium under incomplete information from a Separating equilibrium under complete information, and explain why this understanding is persuasive by examining institutional changes and their effects in Korea.

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I. Introduction

Recently the issue of “legislative inefficiency” is being magnified in Korea and the nation’s major newspapers¹ give a good deal of space to the problem and report it. To sum the stories up, legislative inefficiency is, as shown Figure 1, criticized and characterized by two noticeable features: (i) sharp increase of the number of bills

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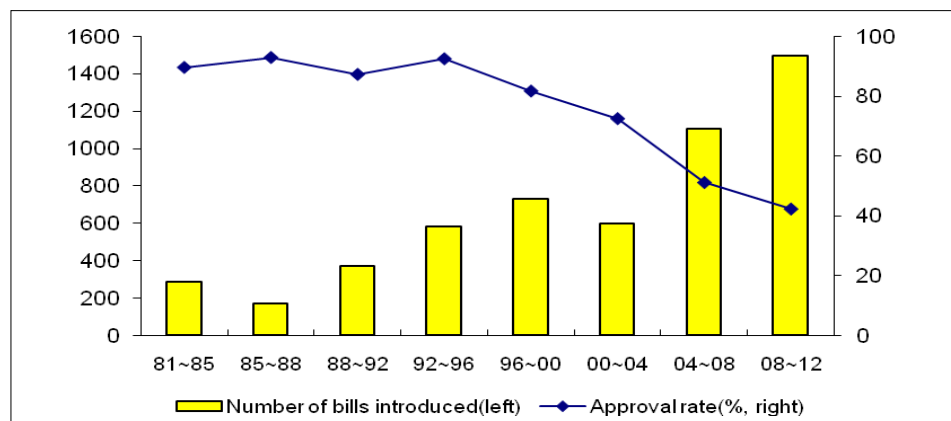
* Research Institute of Insurance and Finance, Samsung. 7th Fl., 87 Euljiro 1 Ga, Jung-Gu, Seoul 100-782, Korea, Phone : +82-2-758-4337. E-mail : yj0612.lee@samsung.com .The paper has been culled and adapted from the previous paper by the author titled “Bureaucrats and Inefficiency.” The author would like to thank John Duffy, Ted Temzelides, and Utku Unver for leisurely discussions and comments on the previous version of the paper. The author also thanks two anonymous referees for their valuable comments.

¹ Specific instances include Dong-A Ilbo (2011. 4/21), Hankook Ilbo (2011. 7/13), Kookmin Ilbo (2011. 7/26), and so on.

introduced by the government² in the narrow sense and (ii) rapid decline of the approval rate by the legislature during the same period. Although government's participation in the legislative process is regarded as a global trend and although we fully admit the increased needs for legislation as a result of complexity of the society, such a sharp increase of bill introduction combined with such a sudden decrease of approval rate remain unanswered. This motivates our research and this paper tries to answer why and how this phenomenon happens.

At a glance, it seems that there exists a structural change in the movement of two variables in Figure 1 from the early 2000s. In particular, Figure 1 says that one side, the government, tries to increase the numbers of laws and the other side, the legislature, tries to block them under the system of constitutional checks and balances. We deduce that the graphical trend of two variables reflects a state of tension on the intent of the bills and, therefore, reveals the change of relationship between the government and the legislature that conventionally stand in the relation of principal-agent.

[Figure 1] Legislative Inefficiency



On top of this we observe that there was a crucial institutional change in Korea

² The introduction of bill by the government in the narrow sense is an outcome of Korea's typical political system. Institutionally there are two representative political systems: the parliamentary system and the presidential system. In the parliamentary system most bills are introduced into legislator by the government, given that the legislator and the government share the same roots so they share the same objectives. In the presidential system specified in the Constitution of the United States, the government is formally separated from the legislature and all the bills must originate from the legislature and are therefore all proposed by members of the legislature. Korean presidential system is a mixture of both the parliamentary and the presidential system, where the premier (or, prime minister) is responsible to the president rather than to the legislature. On top of this, 1) unlike the US presidential system, the bills can be actively introduced into the legislature by the government, although 2) the legislature and the government may have their own objectives independently.

during the late 1990s and early 2000s, which was the introduction of the Open Career System (OCS hereafter).³ Also there was a tremendous change in Korea's political history, which is the establishment of the principle of separation of powers. Our premise is that the degree of incomplete information on the type of the government have deepened since introduction of the OCS and hence damaged job security in the middle of the political change.

Armed with this deduction we model the legislative process in the signaling game and study how incomplete information (or information asymmetry) plays a role in the issue of legislative inefficiency. We simplify the model as a game of two players, the government (in the narrow sense) and the legislature, and consider legislation process as a two-stage game in which, the government first decides whether to introduce the bill and the legislature who, after observing the government's bill introduction, chooses whether or not to approve the bill. The type of the government is private information.⁴ We assume that the political-type government complies with the social preference and therefore maximizes the voters' utility, whereas the bureaucratic-type government does not care about the voters' interest and fulfills whatever goals have been assigned to for its own purpose. The legislature is a political organization almost by definition so that it maximizes the voters' interest. Finally we show in the model that legislative inefficiency can be interpreted as a shift to a Semi-separating equilibrium under incomplete information from a Separating equilibrium under complete information.

We show that, contrary to a complete information setting, only a pooling equilibrium can be sustained in the model where both types of government choose to introduce the bill and the legislature responds by approving the bill if the probability of facing a political-type government is sufficiently large. Otherwise, only a semi-separating equilibrium exists where the bureaucratic-type government randomizes between introduction and no introduction of the bill, and the legislature also responds by choosing a mixed strategy after observing the introduction. The latter equilibrium well explains what happened in the legislation process which results in "legislative inefficiency": an increase of bill introduction by the government and low approval rate by the legislature.

This paper made some contribution from policy-related aspects. First, this paper

³ Government personnel system is largely classified into the Closed Career System (CCS) and the Open Career System (OCS). In the Closed Career System recruitment of new employees is restricted at the entry level only, and upper level positions are filled in entirely from within and lateral entry is discouraged. Germany, Belgium, Ireland, Japan, and France basically employ the CCS. In the OCS, on the other hand, entrance is permitted at any or all levels. United States, United Kingdom, Australia, New Zealand, Sweden, Norway, and the Netherlands have the OCS.

⁴ Readers might think, as a referee pointed out, that the game is played whenever there is a person in the government who considers introducing a bill. Then it will be clearer to think about the type of a person in the government who is entitled to propose a bill rather than to talk about the type of the government.

deals with a current issue of Korean society and tries to explain its cause and effect. The paper examines why and how legislative inefficiency emerges using a simple signaling model and explains inefficiency as an equilibrium phenomenon. We should admit that legislative inefficiency is quite a complicated problem so that a wide range of factors should be considered. Nevertheless we adopt a simple signaling game approach based on the traditional principal-agent relation, and suggest that information asymmetry between the government and the legislature aggravates in the early 2000s and this result in the shape of equilibrium shift.

Second, by analyzing a theoretic possibility that the OCS introduced to strengthen the level of competitiveness of government may produce unintended legislative inefficiency as side effects, the paper assures policy makers of the law of unintended consequences. The law of “unintended consequences,”⁵ developed by a distinguished sociologist Robert Merton (1910~2003), is an adage that an intervention in a complex system always creates unanticipated and often undesirable outcomes. We think this paper adds another example of the law of unintended consequences. The paper calls attention to governmental policy change. Also, this paper calls for cautions in the empirical researches that try to identify the causes of legislative inefficiency. Our result says that institutional change and hence the change of incentives by the players should be importantly considered.

The paper is organized as follows. The next section describes the model under incomplete information. Section III characterizes the set of equilibria, and section IV discusses the Korea’s legislative inefficiency in terms of institutional changes and hence players’ behavioral change. Section V concludes.

II. The Model

We simplify the legislation model as a two-stage game with two players: Government (in the narrow sense) and Legislature. The specific time structure of the game is as follows:

As a standard signaling game, first, Nature selects the type of the government which is privately observed by itself but not by the legislature. For simplicity, assume that the type of the government is either political, P , or bureaucratic, B , with associated probabilities p and $1-p$ respectively. We assume that the political-type government complies with the social preference and therefore maximizes the voters’ utility, whereas the bureaucratic-type government does not

⁵ The use of plastic helmets is a good example. In the 1940s professional and amateur football players started wearing plastic helmets, which provided more protection than leather padding. But players then used their plastic-encased heads like battering rams, sometimes causing severe injuries not only to opponents but also to themselves. Although the rules of football now prohibit “spearing” with the helmet, the practice is still widespread.

care about the voters' interest and fulfills whatever goals have been assigned to for its own purpose. In this paper, assume that the legislature is a political organization so that it maximizes the voters' interest.

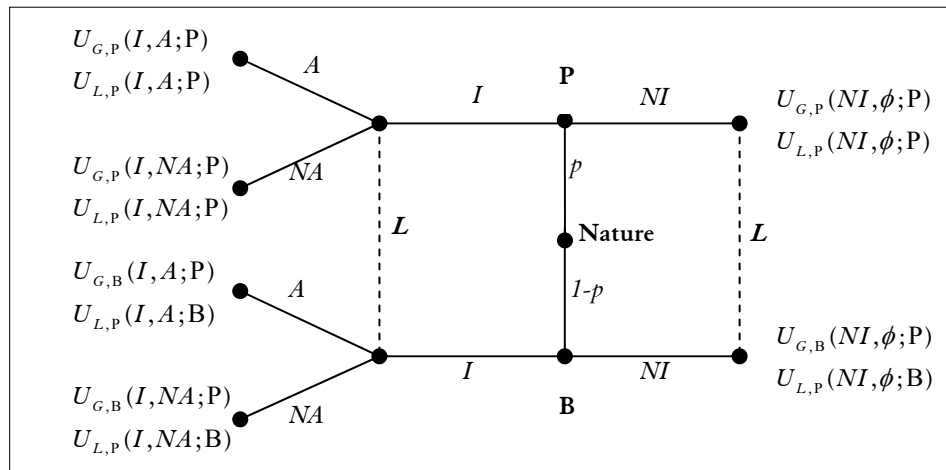
After observing its type, the government introduces a bill to the legislature. If the government does not introduce the bill, the game ends.

If the government introduces the bill, the legislature chooses to approve or not to approve the bill, given its posterior beliefs about the type of the government. If the legislature responds by not approving, the game ends. We further assume that the effects of the bill on the voters are not verifiable in advance before its implementation.

If the bill is passed by the legislature, the government implements the bill.

In the model the only dimension of asymmetry is the type of the government. Let $U_{i,t}(S_G, S_L; \theta)$ where $i = \{G(\text{government}), L(\text{legislature})\}$ and $t = \{P, B\}$, represent t -type agent i 's utility from the legislation outcome with a θ -type counterpart, where $S_G = \{I, NI\}$ denotes the strategy set of the government (Introduce or Not Introduce, respectively) and $S_L = \{A, NA, \phi\}$ denotes the strategy set of the legislature (Approve, Not approve, or empty, respectively). Recall that the legislature is political-type in this paper. For instance, let $U_{G,t}(NI, \phi; P)$ denote the government's utility where the government does not submit the bill, since the legislature's action is empty. In addition, $\mu(P|I)$ and $\mu(P|NI)$ denote the legislature's posterior belief about the government's type being political, after observing that the government introduced the bill or that it did not, respectively. All these words can be translated into the following succinct game tree.

[Figure 2] Game Tree



Government's utility: When the government introduces the bill but the legislature responds by not approving, the government's payoff is $U_{G,t}(I, NA; P)$.

In this case, the legislation is not successful, and the final outcomes coincide with those under no introduction. Nonetheless, the political-type government gets some utility from introducing the bill. Voters' criticism is toward the legislature's irresponsibility, and the government benefits from self-contentment to perform its duty for a great cause as well as enhanced public image. Therefore, $U_{G,P}(I, NA; P) > U_{G,P}(NI, \phi; P)$. The bureaucratic-type government, however, does not benefit from the submission of the failed legislation, imposing only a negotiation cost. Hence, the bureaucratic government does not submit the bill and avoids the negotiation process when it anticipates the non-approval of the bill, i.e., $U_{G,B}(NI, \phi; P) > U_{G,B}(I, NA; P)$. We measure the government's negotiation cost by $U_{G,B}(NI, \phi; P) - U_{G,B}(I, NA; P)$. When the legislature responds by approving the bill, the government's payoff becomes $U_{G,t}(I, A; P)$ for all t . $U_{G,P}(I, A; P) > U_{G,P}(I, NA; P)$ since its duty is fully performed when the bill is signed by the legislature than when it is not. Therefore, the political-type government prefers to present a bill regardless of the legislature's response. That is,

$$U_{G,P}(I, A; P) > U_{G,P}(I, NA; P) > U_{G,P}(NI, \phi; P).$$

The bureaucratic-type government also obtains benefits from the pass of the bill after its introduction, since its assignment is successfully fulfilled, therefore,

$$U_{G,B}(I, A; P) > U_{G,B}(NI, \phi; P) > U_{G,B}(I, NA; P).$$

Legislature's utility: The legislature obtains a payoff of $U_{L,P}(NI, \phi; \theta)$ when the government does not move. If, instead, the government introduces the bill but the legislature responds by not approving, its payoff is $U_{L,P}(I, NA; \theta)$. If the legislature responds by approving the bill its payoff is $U_{L,P}(I, A; \theta)$. In order to make the legislature's legislative decision interesting, let us assume that, after receiving the bill introduced by the government, the legislature chooses to approve when the government is political-type so that pursues voters' interest, i.e., $U_{L,P}(I, A; P) > U_{L,P}(I, NA; P)$. In contrast, the legislature does not approve the bill when the government is bureaucratic-type so that it pursues the goal of its organization, i.e., $U_{L,P}(I, A; B) < U_{L,P}(I, NA; B)$. Therefore, the legislature's benefit from the approval of a bill with a θ -type government, $AB_{L,P}(\theta) \equiv U_{L,P}(I, A; \theta) - U_{L,P}(I, NA; \theta)$, is positive when the government is political-type i.e., highly-concerned about voters' interest, $AB_{L,P}(P) > 0$, but negative otherwise, $AB_{L,P}(B) < 0$. In addition, assume $|AB_{L,P}(P)| > |AB_{L,P}(B)|$ i.e., the benefit from good legislation is higher than the loss from bad legislation.

III. Equilibrium under Incomplete Information

According to the above specification, in a complete information setting, the legislature chooses to approve a bill after the introduction of the bill by the government when the government is political-type, but to not approve the bill when the government is bureaucratic-type. Hence the political-type government chooses to introduce the bill but the bureaucratic-type chooses not to. This complete information environment, therefore, leads to the standard “purified” result in which the bills are not introduced unless both agents share the same political concerns. By adding incomplete information into the context, however, we next demonstrate that the bills are introduced with positive probability even though their political concerns are different. Let us first show that there is only one Perfect Bayesian Equilibrium (PBE) involving pure strategies

Proposition 1. *In the signaling game of legislation, only a pooling strategy profile can be sustained as a PBE in pure strategies for any $p \geq \bar{p}$, where*

$$\bar{p} = -AB_{L,P}(B) / (AB_{L,P}(P) - AB_{L,P}(B))$$

, and it survives the Cho and Kreps' (1987) Intuitive Criterion.

Proof of Proposition 1

Separating equilibrium: Let us first show that the separating strategy profile in which the government chooses to introduce (not introduce) the bill when its type is political (bureaucratic, respectively) cannot be supported as a PBE of the game. Under such strategy profile, the legislature's beliefs are updated according to Bayes' rule and become $\mu(P|I)=1$ and $\mu(P|NI)=0$. Given these posterior beliefs, the legislature pass the legislation since $U_{L,P}(I,A;P) > U_{L,P}(I,NA;P)$. As a consequence, the government chooses to present the bill both when its type are political and bureaucratic, since $U_{G,t}(I,A;P) > U_{G,t}(NI,\phi;P)$ for both type t . But this strategy profile for the government contradicts the separating strategy described above, and therefore it cannot be sustained as a PBE of the game.

Pooling equilibrium: Let us next demonstrate that the pooling strategy profile, where the government introduces the bill regardless of its type, can be part of a PBE under certain condition. In this strategy, the legislature's posterior beliefs cannot be updated and thus coincide with its priors, i.e., $\mu(P|I)=p$ and $\mu(B|I)=1-p$. (Note that off-the-equilibrium beliefs do not play a role in this pooling equilibrium. In particular, after observing the off-the-equilibrium action of no introduction the

legislature has, by definition, an empty action space. Therefore, off-the-equilibrium beliefs cannot affect the legislature's response and, as a consequence, do not affect the government decision either.) Given these beliefs, the legislature chooses to not pass the legislation if

$$p \times U_{L,P}(I, A; P) + (1-p) \times U_{L,P}(I, A; B) < p \times U_{L,P}(I, NA; P) + (1-p) \times U_{L,P}(I, NA; B),$$

$$p < \frac{-(U_{L,P}(I, A; B) - U_{L,P}(I, NA; B))}{[U_{L,P}(I, A; P) - U_{L,P}(I, NA; P)] - [U_{L,P}(I, A; B) - U_{L,P}(I, NA; B)]}$$

or, more compactly, $p < -AB_{L,P}(B)/(AB_{L,P}(P) - AB_{L,P}(B)) \equiv \bar{p}$ where $\bar{p} > 0$ since the legislature's payoffs satisfy $AB_{L,P}(B) < 0$ and $AB_{L,P}(P) - AB_{L,P}(B) > 0$ by definition, and $\bar{p} < 1$ given that $AB_{L,P}(P) > 0$. Let us next analyze equilibrium strategies for the government, for different priors p .

1. *Low priors*, $p < \bar{p}$. In this case the legislature responds by not approving the bill. Since $U_{G,P}(I, NA; P) > U_{G,P}(NI, \phi; P)$ and $U_{G,B}(NI, \phi; P) > U_{G,B}(I, NA; P)$, the government introduces the bill when it is political-type, but does not when it is bureaucratic-type. This, however, contradicts the definition of the pooling strategy profile. Thus, this pooling strategy profile cannot be supported as a PBE of the game when $p < \bar{p}$.

2. *High priors*, $p \geq \bar{p}$. In this case the legislature approves the bill. Since $U_{G,P}(I, A; P) > U_{G,P}(NI, \phi; P)$ and $U_{G,B}(I, A; P) > U_{G,B}(NI, \phi; P)$, the government introduces the bill both when its type is political and bureaucratic. Hence, the pooling strategy profile can be supported as PBE of the game when $p \geq \bar{p}$.

Finally, in a similar way we can show that the other pooling strategy profile, where the government does not present the bill regardless of its type, cannot be sustained as part of a PBE.

Intuitive Criterion: The pooling strategy profile described above survives the Cho and Kreps' (1987) Intuitive Criterion. First, there is no action for the legislature when the government takes the off-the-equilibrium strategy, and thus the legislature's off-the-equilibrium belief is immaterial. Second, here the Intuitive Criterion is satisfied trivially because it does not apply ("NI" is equilibrium-dominated for both types). ■

This result could be intuitively anticipated. First, the government cannot choose a type-dependent strategy, where he introduces (does not introduce) the bill when

its type is political (bureaucratic, respectively). Otherwise, the legislature could infer his type by observing his action, and therefore respond as in the complete information case, where the legislature passes the bill submitted by the government. Hence, this implies that the bureaucratic government also has incentives to submit a bill. As a consequence, no separating equilibrium exists in which only the political-type government introduces the bill. In contrast, a pooling equilibrium can be supported when the probability of facing a political-type government is sufficiently large. In this case, the legislature responds by approving the bill, and both types of government prefer to submit as well. Furthermore, note that, for a given $AB_{L,p}(B)$, an increase in $AB_{L,p}(P)$ expands the set of priors under which the legislature chooses to pass the bill in this pooling equilibrium. Intuitively, the bill becomes more attractive for the legislature when the benefits from approving the bill increase, thus inducing the legislature to sign.

Proposition 1 says that under the influence of incomplete information both types of government submit the bill and the legislature approves all the bills introduced. Note that this pooling equilibrium can explain the increased number of bills introduced, but cannot explain the decreased approval rate. So Proposition 1 is not enough for a game theoretic description of legislative inefficiency mentioned before.

Then what happens when $p < \bar{p}$? When the probability of facing a political-type government is low, i.e., $p < \bar{p}$, the legislature does not approve the bill and the former pooling equilibrium cannot be sustained in the game. In the following proposition, we describe mixed strategy profile in the incomplete information context.

Proposition 2. *A semi-separating strategy profile can be sustained as a PBE of the signaling game of legislation, when $p < \bar{p}$, in which:*

1. *The government submits the bill with probability $p_B = \frac{p}{1-p} \frac{\bar{p}}{1-\bar{p}} \in (0,1)$ when it is a bureaucratic-type, and submits the bill with probability one when it is political-type, i.e., $p_p = 1$; and*
2. *The legislature responds by approving the bill with probability $\hat{\gamma} \in (0,1)$ where its posterior belief is $\mu(P | I) = \bar{p}$, where $\hat{\gamma} \equiv \frac{U_{G,B}(NI, \phi; P) - U_{G,B}(I, NA; P)}{U_{G,B}(I, A; P) - U_{G,B}(I, NA; P)}$.*

Proof of Proposition 2

Let us first analyze the legislature's strategy. This player must be mixing. Otherwise, the government could anticipate the legislature's action and play pure strategies as in any of the strategy profiles described in Proposition 1, which are not PBE of the signaling game when $p < \bar{p}$. Hence, the legislature must be indifferent

between approving and not approving the bill, that is,

$$\begin{aligned} & \mu(P|I) \times U_{L,P}(I, A; P) + (1 - \mu(P|I)) \times U_{L,P}(I, A; B) \\ &= \mu(P|I) \times U_{L,P}(I, NA; P) + (1 - \mu(P|I)) \times U_{L,P}(I, NA; B) \end{aligned}$$

or $\mu(P|I) = \bar{p}$. We can next use the legislature's posterior beliefs in order to find the probability with which the government randomizes when it is bureaucratic-type, p_B , by using Bayes' rule,

$$\frac{(1-p) \times p_B}{((1-p) \times p_B) + (p \times p_P)} = \bar{p} = \mu(P|I)$$

where $p_P = 1$. Solving for p_B , we obtain

$$p_B = \frac{p}{1-p} \frac{\bar{p}}{1-\bar{p}} \in (0,1).$$

In addition, $p_B < 1$ for all p satisfying $p < 1 - \bar{p}$. Since $|AB_{L,P}(P)| > |AB_{L,P}(B)|$, cutoff \bar{p} satisfies $\bar{p} < 1/2$, which implies $p < 1 - \bar{p}$ is satisfied for all priors, because $p < \bar{p}$ by assumption.

Finally, note that if the government mixes with probability $p_B \in (0,1)$, it must be that the legislature makes it indifferent between approving and not approving the bill.

$$\begin{aligned} & \gamma \times U_{G,B}(I, A; P) + (1 - \gamma) \times U_{G,B}(I, NA; P) = U_{G,B}(NI, \phi; P), \text{ or} \\ & \gamma = \frac{U_{G,B}(NI, \phi; P) - U_{G,B}(I, NA; P)}{U_{G,B}(I, A; P) - U_{G,B}(I, NA; P)} \equiv \hat{\gamma} \end{aligned}$$

where $\hat{\gamma}$ denotes the probability with which the legislature mixes between approving and not approving the bill. This probability is positive given that the bureaucratic-type government's payoffs satisfy, $U_{G,B}(NI, \phi; P) > U_{G,B}(I, NA; P)$ and $U_{G,B}(I, A; P) > U_{G,B}(I, NA; P)$, and $\hat{\gamma}$ is less than one since $U_{G,B}(NI, \phi; P) < U_{G,B}(I, A; P)$. ■

Thus, both types of government submit the bill with a strictly positive probability and the legislature approves a part of bills introduced. This result well explains a form of legislative inefficiency mentioned above since, under incomplete information, the sheer possibility that the government might be highly concerned

about voters' interest induces the legislature to approve the bill with positive probability, and this make the bureaucratic-type introduce the bill with some probability. Now there remains to argue why p is small. It is a very hard question and belongs to the realm of empirical study. Instead here we quote an opinion of Gordon Tullock on the bureaucrats and the government as a whole.

"...if bureaucrats are ordinary men, they will make most of (not all) their decisions in terms of what benefits them, not society as a whole. Like other men, they occasionally sacrifice their own well-being for the wider good, but we should expect this to be exceptional behavior."

To summarize, Propositions 1 and 2 imply two sides of the coin. On one hand, the existence of bureaucratic-type prevents the emergence of separating equilibrium, which is the key factor in legislative inefficiency. On the other hand, the possibility that the government might be politically concerned about voters' interest, even though the probability of being political-type very low, induces the uninformed legislature to pass the bill with positive probability.⁶

From a policy perspective, our results suggest that an interested third party like a beneficiary of the law have incentives to either strategically distribute or conceal information in order to promote the legislative process. First, if the interested party holds information about the government being highly political, it might choose to distribute this information to the members of the legislature involved in legislation. In the context of our model, this ensures that the legislature chooses to pass the bill, and thus the pooling equilibrium is sustained. If, in contrast, legislature is unsure about the government's true type (and assign a small probability to the government being political-type) the semi-separating equilibrium emerges. Importantly, since legislation are less likely to be successful in the semi-separating than in the pooling equilibrium, policies that increase the likelihood of the pooling equilibrium are efficiency enhancing. Second, we show that if the government is bureaucratic-type, an interested third party can improve legislative efficiency by "planting seeds of doubt" about the government's type. In terms of our model, this modifies equilibrium predictions from one where the legislature fails the bill (because it assigns full probability to the government being bureaucratic-type) to one in which the legislature responds by randomizing its decision (since it now assigns a positive

⁶ Our conclusions have flavor of those of Kreps et al. (1982), who consider the role of informational asymmetries about players' types in the Prisoner's Dilemma game. Specifically, in their model players assign some probability to his opponent playing a conditionally cooperative, tit-for-tat strategy. They show that there is a sequential equilibrium in which players choose to cooperate with positive probability. Similarly, in this paper, we demonstrate that the presence of incomplete information about the type of the bureaucrat may lead to cooperation in situations where such equilibrium outcome would not exist among perfectly informed countries.

probability to the government being political-type). Importantly, above discussion suggests that an interested party has incentives to distribute information about the government being political-type irrespective of its true types. This implies, however, that public announcements from the interested party stating that the government is highly concerned about the voters' interest become uninformative. Let us next conduct some comparative statics of our previous result.

Corollary 1. *The government's probability of introducing the bill when he is bureaucratic-type, p_B , is: (1) increasing in the probability p ; and (2) increasing in the legislature's cost of approving the bill with the bureaucratic-type government, $|AB_{L,p}(B)|$. Furthermore, the legislature's probability of approving the bill, $\hat{\gamma}$, is: (1) increasing in the government's negotiation cost, $U_{G,B}(NI, \phi; P) - U_{G,B}(I, NA; P)$; and (2) decreasing in the benefits that the bureaucratic-type government obtains when the legislature approves the bill, $U_{G,B}(I, A; P) - U_{G,B}(I, NA; P)$.*

Let us briefly examine intuitions behind the corollary. First, an increase in the probability of the government being political-type raises the legislature's incentives to approve the bill, and this, as a result, increases the bureaucratic-type government's probability to submit the bill to the legislature. Second, an increase of the cost of approving the bill with a bureaucratic-type government (that is, $AB_{L,p}(B)$ becoming more negative) reduces the set of beliefs for which the legislature responds by approving the bill. Hence, in order to be perceived as a political-type, the government submits the bill with a higher probability p_B . An increase in the government's negotiation cost, $U_{G,B}(NI, \phi; P) - U_{G,B}(I, NA; P)$, makes the approval of the bill more costly, reducing the likelihood that the bill originates from the bureaucratic-type. As a consequence, it is more likely to face a political-type government, raising the probability $\hat{\gamma}$ with which the legislature approves the bill. In contrast, an increase in the benefit that the bureaucratic-type government obtains from the legislature's approval of the bill, $U_{G,B}(I, A; P) - U_{G,B}(I, NA; P)$, raises the government's incentive to submit the bill. Therefore, the likelihood of facing the bureaucratic-type increases, and ultimately reduces the legislature's probability of signing the bill.

IV. Interpretation: A Case of Legislative Inefficiency in Korea

We understand legislative inefficiency as a shift to a Semi-separating equilibrium under incomplete information from a Separating equilibrium under complete information. In this section we explain how legislative inefficiency can be

understood as an equilibrium shift and show why this interpretation is persuasive by examining institutional changes and their effects in Korea at the time of equilibrium shift.

In the previous sections we observe in the graph that legislative efficiency severely deteriorates in Korea from the early 2000s. And the Open Career System (OCS) was introduced during the late 1990s and early 2000s. Also we have a view that the principle of separation of powers was substantially established during the same period. Based on these factors we model the legislative process in the framework of signaling game. Our premise is that the degree of incomplete information on the type of the government have deepened due to the introduction of the OCS and hence damaged job security, and the check and balance mechanism have actually worked due to the principle of separation of powers.⁷

What happened in the government after introduction of the OCS? Korean government personnel system has been based on the Career Civil Service System (CCSS), and job security was guaranteed throughout the period of service. The system with guaranteed job security and “the principle of seniority” couldn’t function well in increasing the competitiveness in the public sector. Based on that recognition, the Korean government carried out drastic reforms in the human resource management system and promulgated the OCS by enactment of a Presidential decree named “the regulations affecting the operation of OCS” in February 2000 after several years of introductive process. The introduction of OCS was partial and gradual within the limit of 20% of the positions of Grade 1~3 at each central department. (Government Organization Act, Clause 2.) Challenge and resistance, however, was severe. The civil servants were afraid of losing their job and opportunities by fierce competition with the private sector. And, from the very beginning of the reform there was a concern that government officials might strategically react by organizational selfishness as Parkinson’s law illustrates or by rent-seeking behavior to compensate weakened job security in the public service. Concerned about this, therefore, the legislature as a principal might strengthen checks and controls even in the realm of legislation. This is our key supposition and interpretation on how incomplete information worsens.

Now let us think about the view that the principle of separation of powers was substantially established during the late 1990s and early 2000s. Before President Kim Dae-jung administration (1998~2003), the ruling party, which turns out the President, have coincided with the majority party of the National Assembly, which means that they have the same root and share the same objective. Therefore, the legislature, to some extent, was able to understand the purpose of legislation, and

⁷ Readers might think that the increased information asymmetry on the government’s type is not responsible for the increased legislative inefficiency in Korea. Instead, the increased conflicts between the congress and the government are more responsible. The author think that this point of view is already accommodated in the strengthened principle of separation of power.

the degree of incomplete information was insignificant. On the contrary, in President Kim Dae-jung administration (1998~2003) and the early part of Roh Moo-hyun administration (2003~2008), the ruling party and the majority party were different. This aggravates information asymmetry between both sides and the inference of the type of the government was hard to make. That is, the legislature faces uncertainty where it can not perfectly observe the government's type and check and balance mechanism actually worked.

With these discussions in mind, let us reinterpret "legislative inefficiency" depicted in Figure. As mentioned above we interpret the change of two variables before and after 2000 as the transition of equilibrium. There is a small amount of bill introduction (by the government) and the high approval rate (by the legislature) until the National Assembly's term of 1992~1996. Superficially this can be regarded as a separating equilibrium outcome under the complete information, where only the political-type government introduces the bills (which explains a small amount of bill introduction), and the bills are almost approved by the legislature (which describes the high approval rate).

After introduction of the Open Career System in 2000, however, the trend changes a lot. After 2004, bill introduction dramatically increased and the approval rate severely dropped. Superficially we regard this phenomenon as a result of a Semi-separating equilibrium under the incomplete information. Both types introduce the bills with a strictly positive probability and a part of the bills introduced is approved. There are two comments in interpreting the results. First, the increase of bill introduction in the congressional term of 1996~2000 should be still understood as a separating equilibrium outcome, since this reflects an urgently increased need for legislation after 1997~1998 Korean currency crisis. Korea experienced a paradigm shift in all fields of the society during this period. Second, we regard the term 2000~2004 as a transition period for a learning or an experiment after a significant institutional change in 2000 since it is realistically difficult to have a sudden change from a Separating equilibrium with complete information to a Semi-separating equilibrium with asymmetric information. But there is still a sign of equilibrium change in the sense that the approval rate comes to decline in spite of a decrease in bill introduction with gradual change in p .

V. Conclusions

This paper investigates the role of incomplete information to explain the cause of legislative inefficiency which is a current issue in Korean society. The Open Career System (OCS) was first introduced in the Korea's government personnel system during the late 1990s and early 2000s, and legislative efficiency severely deteriorates

in Korea in the early 2000s phenomenologically. On top of these, we consider that the principle of separation of powers was substantially established during the same period. Based on all these factors we model the legislative process in the signaling game. Our deduction is that the degree of incomplete information on the type of the government have deepened due to the introduction of the OCS and damaged job security, and the check and balance mechanism have actually worked due to the principle of separation of powers, which results in the revelation of legislative inefficiency.

This paper throws some implication from a policy aspect. By analyzing a theoretic possibility that the OCS, introduced to strengthen the level of competitiveness of government, may produce unintended legislative inefficiency as a side effect, the paper assures policy makers of the law of unintended consequences.

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