17 Research Study on an Ideal Patent Purchase System to Complement the Patent System(*)

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Since a patent system gives exclusive rights to inventors, it hinders competition and causes social inefficiency. Yet, we maintain the patent system despite this disadvantage. One of the reasons is its contribution to the creation of technological innovations. Specifically, by clearly stipulating in the patent system that inventors would be protected, encouragement of R&D investments is sought. However, it is not desirable to leave the problem of social inefficiency caused by the patent system unaddressed. This research proposes a system that would complement a patent system in order to solve the aforementioned problem of inefficiency. More specifically, this research proposes a patent purchase system. It also reveals cases in which the existence of a patent purchase system could reduce social inefficiency and discusses the relationship between a patent purchase system and corporate R&D investment activities.

I Introduction

Since the existing patent system gives exclusive rights to inventors for a certain period of time, it hinders competition and causes social inefficiency. Yet, we maintain the patent system despite this disadvantage. One of the reasons is its contribution to the creation of technological innovations. Specifically, by clearly stipulating in the patent system that inventors shall be protected, encouragement of R&D investments is sought to accelerate technological innovation.

If non-patentees are permitted to use a technology protected under a patent system, it would promote competition and reduce social inefficiency. The academic paper published by Kremer in 1998 (the academic paper shall hereinafter referred to as "Kremer (1998)") was the first to propose the idea that the government should purchase patents and place them in the public domain. Kremer (1998) argued that the government, which has no information about the value of a patent, should obtain that information from non-patentee companies and determine the patent purchase price based thereon. More specifically, it proposed that a patent should be submitted to an auction in which non-patentee companies can participate. The second highest bid would be multiplied severalfold and adopted by the government as the patent purchase price. In order to accurately evaluate the value of a patent, the system will be designed in such a way that a patent will be transferred, with a fixed probability, to the company that submitted the highest bid. Under the system, the patentee company would be permitted to decide whether to accept the patent purchase price proposed by the government.

If the government were to become a purchaser of patents, the patent purchase price should be lowered as much as possible. However, Kremer (1998) has not conducted sufficient analysis on this point. So we have conducted this research and proposed a new patent purchase system in order to minimize patent purchase prices, and have examined whether such a patent purchase system would reduce social inefficiency. In this research, we will propose a patent purchase system that would allow the government to purchase patents and place them in the public domain as described below. Since the government has no information on the value of a patent, the government would have non-patentee companies report an estimate of the patent value and would determine the patent purchase price based thereon. Then, the government would propose the patent purchase price to the patentee company. The patentee company would be allowed to decide whether to accept the patent purchase price proposed by the government. If the patent is purchased, the government would pay the patent purchase price. The non-patentee companies also partially pay the patent purchase price.

We have found that, in a simple situation involving only one patentee company and one

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non-patentee company, the patent purchase price could be minimized under the patent purchase system proposed by this research. We have also found that, when the effect of a patent purchase is evaluated based on the change in social surplus and the government's payment for the patent purchase price, if the placement of a patent in the public domain allows all companies to produce goods at the same marginal cost, the greater the non-patentee company's payment for the patent purchase price is, the greater the effect of the patent purchase would be.

By investing in R&D activities, companies can invent new technologies and obtain patents. We have examined a case where companies are given an opportunity to make a decision on R&D investments and have discussed how their decision-making process would differ between the following two scenarios: where a patent purchase system exists and where such a system does not exist.

We have found that a patent purchase price would be minimized under the above-described patent purchase system as long as there is only one non-patentee company. We have also found that a patent purchase system would reduce social inefficiency. Furthermore, we have examined whether the same effect can be obtained if two non-patentee companies were to exist. For this purpose, we have altered the patent purchase system originally designed to be applied to cases where only one non-patentee company exists. First, the government would adopt as the patent purchase price the second highest estimate from among the reported estimates of the patent value. Then, if a patent is purchased, the non-patentee companies would partially pay the patent purchase price. Even if a patent is not purchased, the non-patentee companies would make their respective payments based on the reported estimates of the patent value. We have found that the altered patent purchase system could minimize the patent purchase price if two non-patentee companies were to exist. We have also found that, if the placement of a patent in the public domain allows all companies to produce goods at the same marginal cost, the greater the non-patentee companies' payment for the patent purchase price is, the greater the effect of the patent purchase would be.

The structure of this report is as follows. Chapter II examines the basic model. Chapter III discusses the action that companies would take under the patent purchase system and figures out in what cases the patent purchase system could reduce social inefficiency. As the basic model, we will discuss a case where one company already owns a patent. Chapter IV analyzes cases where companies can invent patentable new technologies by making R&D investments, and it discusses the influence that the existence of a patent purchase system has on corporate R&D investment activities. Chapter V re-examines a case where one company already owns a patent. This chapter also examines a case where two non-patentee companies exist, discusses how a patent purchase system should be designed, and determines in what cases the patent purchase system would reduce social inefficiency. Finally, this chapter points out issues that require further study.

Ⅱ Basic Model

This chapter examines a case where two companies exist. It is assumed that one company owns a patent and can produce goods, while the other one does not own a patent and cannot produce goods.

We assume that the government will purchase a patent and place it in the public domain in order to allow the non-patentee company to produce goods. Since the government has no information about the value of the patent, the government has to obtain information on its value from the non-patentee company and determine the patent purchase price based thereon. More specifically, the government would adopt as the patent purchase price the estimate presented in a report on the patent value that the non-patentee company submits to the government. Then, the government proposes the patent purchase price to the patentee company. If the patentee company accepts the proposal, the government would pay the proposed price and obtain a patent. The non-patentee company would also partially pay the proposed price. The purchased patent would then be placed in the public domain. If the proposal is refused, the patent would still be owned by the patentee company, and the non-patentee company would not make any payments.

If a patent is purchased and placed in the public domain, the non-patentee company is also able to produce goods. In this case, it is assumed that both companies would engage in Cournot competition. The price of goods would be determined based on the (inverse) linear demand function. Each company would operate at a

constant marginal cost. It is assumed that the two companies would be able to fully know each other's marginal cost. Under these circumstances, each company engages in profit-maximizing production.

If a patent is not purchased, only the patentee company would produce goods. The price of the goods would be determined based on the (inverse) linear demand function. The patentee company would operate at a constant marginal cost. Under these circumstances, only the patentee company engages in profit-maximizing production.

Ⅲ Analysis of the Basic Model

This chapter examines the action that each company would take under the patent purchase system described in the preceding chapter.

1 Action taken by the patentee company

First, this section examines the action that the patentee company would take in response to the patent purchase price proposed by the government. If the government's proposal is accepted, the patentee company gains profits in the market as well as the amount of money equivalent to the patent purchase price. It should be noted that, even after the patent is purchased and placed in the public domain, the patentee company would be permitted to produce goods. On the other hand, if the government's proposal is refused, the patentee company would only gain profits in the market.

In this case, if the patent purchase price proposed by the government is larger than the discrepancy between the estimated profits when only the patentee company can produce goods versus the estimated profits when both companies can produce goods, the patentee company would accept the proposal. If it is smaller, the patentee company would refuse the proposal. Here we assume that if the government-proposed patent purchase price is equivalent to the abovementioned discrepancy, the patentee company would accept the proposal.

2 Action taken by the non-patentee company

Next, this section discusses the kind of report that the non-patentee company would submit to the government. The non-patentee company would report an estimate of the patent value in consideration of the action that the patentee company would take in response to the government's proposal.

Consequently, the estimate of the patent reported by the non-patentee company would be the same as the discrepancy between the estimated profits when only the patentee company can produce goods versus the estimated profits when both companies can produce goods, provided that the non-patentee company would prefer obtaining zero profits in the case where the patent is purchased rather than obtaining zero profits in the case where the patent is not purchased.

Let's assume that the non-patentee company reports a slightly higher estimate than the estimate presented in the aforementioned report. In this case, even if the non-patentee company were to report a slightly lower estimate, the patent would be purchased. Furthermore, since the patent purchase price is lower than the current level, the non-patentee company's payment would be reduced. In other words, by reporting a slightly lower estimate than the current level, the non-patentee company might be able to increase profits. Therefore, the non-patentee company would not report an estimate that is slightly higher than the one presented in the aforementioned report. Similarly, let's assume that the non-patentee company reports an estimate that is lower than the estimate presented in the aforementioned report. In this case, the patent would not be purchased. By reporting an estimate that would lead to the purchase of the patent, the non-patentee company could increase profits. Therefore, the non-patentee company would not report an estimate that is lower than the one presented in the aforementioned report.

The estimate presented in the aforementioned report would be the lowest patent purchase price acceptable by the patentee company. It should be noted that the action of the non-patentee company is predicted based on the assumption that the non-patentee company's share of the payment for the patent purchase price satisfies certain conditions. Thus, if this assumption is false, the non-patentee company would not submit the aforementioned report. Consequently, the patent would not be purchased.

3 Evaluation of the patent purchase system

This section examines whether the

existence of a patent purchase system could reduce social inefficiency. In order to evaluate the effect of the patent purchase system, a formula has been established by using the change in social surplus and the government's payment for the patent purchase price. The term "social surplus" means desirability by society as a whole. By making a comparison between a social surplus when a patent has been purchased and a social surplus when a patent has not been purchased, it is possible to determine whether the patent purchase system has reduced social inefficiency. When a patent is purchased, the government partially pays the patent purchase price. This should be taken into consideration when making an evaluation of the effect of a patent purchase system.

If the result of the calculation according to the formula is non-negative, it may be interpreted that the patent purchase system has reduced social inefficiency. Otherwise, it would be interpreted that the patent purchase system has not reduced social inefficiency.

If a patent is purchased, both the non-patentee company and the patentee company are assumed to be able to produce goods at the same marginal cost. In this case, a patent purchase system generates a certain range for the share of payment for the patent purchase price in which social inefficiency would be reduced.

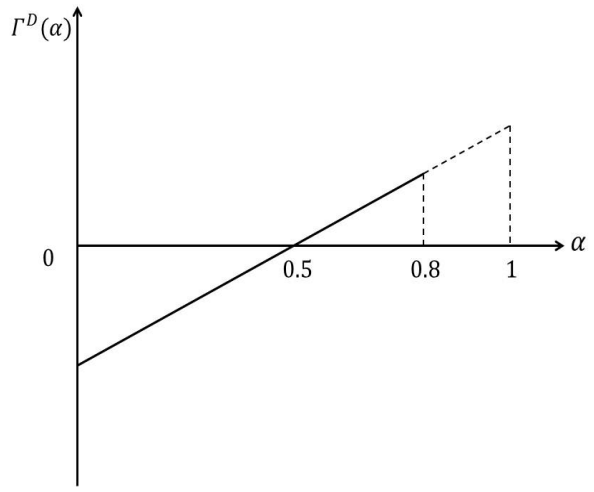

Figure I: Case where only one non-patentee company exists

In fact, if both the non-patentee company and the patentee company can produce goods at the same marginal cost, the change in social surplus is constantly positive. Therefore, the larger the non-patentee company's share of the payment for the patent purchase price is, the more significantly the existence of a patent purchase system would reduce social inefficiency. On the other hand, if the non-patentee company's share of the payment for the patent purchase price becomes excessively large, the company would consider it more desirable for the patent to not be purchased so that the non-patentee company is not permitted to produce goods, rather than facing a situation where the patent is purchased so that the non-patentee company is permitted to produce goods.

Ⅳ Relationship with R&D Investment Activities

By making R&D investments, companies can successfully invent patentable new technologies. This chapter discusses the relationship between a patent purchase system and corporate R&D investment activities.

This chapter examines a case where two companies exist (Company A and Company B) as described in the preceding chapter. It is assumed that the two companies are engaged in Cournot competition and are symmetric. In this case, it would be sufficient to examine either of the two companies.

Now, let's assume that Company i produces goods at a constant marginal cost and that the Company A successfully invents new technologies at a certain probability by making R&D investments. It is also assumed that Company A has successfully invented a new technology and can produce goods at a lower marginal cost than the current level and that, since the new technology is protected by a patent, Company B cannot use the technology. Furthermore, it is assumed that, if both companies successfully invent a new technology, the company entitled to obtain a patent is chosen at an equal probability.

Let's assume that Company A has successfully invented a new technology and obtained a patent and that the price of the goods is determined based on the (inverse) linear demand function. In this case, Company A can produce goods at a lower marginal cost than the current level, while Company B produces goods at the same marginal cost as the current level. Each company engages in profit-maximizing production.

Next, let's assume that Company B has successfully invented a new technology and obtained a patent and that the price of the goods is determined based on the (inverse) linear

demand function. In this case, Company A produces goods at the same marginal cost as the current level, while Company B can produce goods a lower marginal cost than the current level. Each company engages in profit-maximizing production.

Finally, let's assume that neither company has successfully invented a new technology regardless of whether or not it has made R&D investments. It is assumed that the price of the goods is determined based on the (inverse) linear demand function. In this case, each company produces goods at the same marginal cost as the current level and engages in profit-maximizing production.

1 Case where no patent purchase system exists

This section examines the action that companies would take in terms of R&D investments if no patent purchase system exists.

(1) Case where Company B makes R&D investments

This section discusses the benefits that Company A could gain if it makes R&D investments in a case where Company B also makes R&D investments. If Company A makes R&D investments, there would be four possible scenarios: (1) both companies successfully invent a new technology, (2) only Company A successfully invents a new technology, (3) only Company B successfully invents a new technology, and (4) neither company successfully invents a new technology.

Next, this section discusses the benefits that Company A could gain by not making R&D investments. If Company A does not make R&D investments, there would be two possible scenarios: (1) only Company B successfully invents a new technology and (2) neither company successfully invents a new technology.

(2) Case where Company B does not make R&D investments

This section discusses the benefits that Company A could gain if it makes R&D investments in a case where Company B does not make R&D investments. If Company A makes R&D investments, there would be two possible scenarios: (1) only Company A successfully invents a new technology and (2) neither company successfully invents a new technology.

Next, this section discusses the benefits Company A could gain by not making R&D investments. If Company A does not make R&D investments, there would be only one scenario: neither company successfully invents a new technology.

The above-described argument may be summarized by the following table:

	Company B makes investments	**Company B does not make investments**
Company A makes investments	$\frac{\beta(2-\beta)}{2}\pi_i^{DH} + \frac{\beta(2-\beta)}{2}\pi_i^{DL} + (1-\beta)^2\pi_i^D - K$	$\beta\pi_i^{DH} + (1-\beta)\pi_i^D - K$
Company A does not make investments	$\beta\pi_i^{DL} + (1-\beta)\pi_i^D$	π_i^D

Table I: Case where no patent purchase system exists

By specifying a value for each parameter, Company A can determine whether it should make R&D investments if Company B makes R&D investments. Similarly, Company A can determine whether it should make R&D investments if Company B does not make R&D investments.

The same argument may apply to Company B. Therefore, by using numerical examples, it is possible to discuss the action that each company would take in terms of R&D investments if a patent purchase system does not exist.

2 Case where a patent purchase system exists

Next, this section examines the action that each company would take in terms of R&D investments if a patent purchase system exists. If a patent purchase system exists, the government can purchase a patent from the company that has invented a new technology so that the other company can also use the new technology. Therefore, let's assume that, if at least one company successfully invents a new technology, the government would be able to purchase a patent in the manner described in the preceding chapter.

Let's assume that Company A successfully invents a new technology and obtains a patent and that the value of the goods is determined based on the (inverse) linear demand function. Company A would be able to produce goods at a lower marginal cost than the current level. Since the government purchases the patent, Company B would also be able to produce goods at a lower marginal cost than the current level. In this case, each company engages in profit-maximizing production.

(1) Case where Company B makes R&D investments

This section discusses the benefits that Company A could gain if it makes R&D investments in a case where Company B also makes R&D investments, while a similar discussion was held in the preceding section on a case where a patent purchase system does not exist. If Company A makes R&D investments, there would be four possible scenarios: (1) both companies successfully invent a new technology, (2) only Company A successfully invents a new technology, (3) only Company B successfully invents a new technology, and (4) neither company successfully invents a new technology.

Next, this section discusses the benefits that Company A could gain by not making R&D investments. If Company A does not make R&D investments, there would be two possible scenarios: (1) only Company B successfully invents a new technology and (2) neither company successfully invents a new technology.

(2) Case where Company B does not make R&D investments

Similarly, this section discusses the benefits that Company A could gain if it makes R&D investments in a case where Company B does not make R&D investments. If Company A makes R&D investments, there would be two possible scenarios: (1) only Company A successfully invents a new technology and (2) neither company successfully invents a new technology.

Next, this section discusses the benefits that Company A could gain by not making R&D investments. If Company A does not make R&D investments, there would be only one possible scenario: neither company successfully invents a new technology.

The above-described argument may be summarized by the following table:

	Company B makes investments	Company B does not make investments
Company A makes investments	$\beta(2-\beta)\pi_i^{DB} + \frac{\beta(2-\beta)}{2}G_i^{\dagger} - \frac{\beta(2-\beta)}{2}\alpha G_j^{\dagger} + (1-\beta)^2\pi_i^{D} - K$	$\beta(\pi_i^{DB}+G_i^{\dagger}) + (1-\beta)\pi_i^{D} - K$
Company A does not make investments	$\beta(\pi_i^{DB}-\alpha G_j^{\dagger}) + (1-\beta)\pi_i^{D}$	π_i^{D}

Table II: Case where a patent purchase system exists

By specifying a value for each parameter, Company A can determine whether it should make R&D investments if Company B makes R&D investments. Similarly, Company A can determine whether it should make R&D investments if Company B does not make R&D investments.

The same argument may apply to Company B. Therefore, by using numerical examples, it is possible to discuss the action that each company would take in terms of R&D investments if a patent purchase system exists.

Ⅴ Discussion and Conclusion

So far, we have examined a patent purchase system on the assumption that only one non-patentee company exists. If there are two or more non-patentee companies, would a patent purchase system reduce social inefficiency? This chapter discusses a patent purchase system on the assumption that two non-patentee companies exist.

Let's assume that there are three companies and that one patentee company can produce goods, while the other two non-patentee companies cannot produce goods.

As in the case where only one non-patentee company exists, since the government does not have information on the value of the patent, the government has to determine the patent purchase price based on the patent-related information obtained from non-patentee companies. If there are two non-patentee companies, each of which reports an estimate of the patent value to the government, the government has to decide which estimate to adopt as the patent purchase price. Let's assume that the government uses the second highest estimate as the patent purchase price and proposes the price to the patentee company. If the patentee company accepts the proposal, the government would pay the price and obtain the patent. Since there are two non-patentee companies, the government has to determine which company should partially pay the proposed price. It is assumed that both companies would partially pay the proposed price. The patent purchase by the government would be placed in the public domain. If the government's proposal is refused, the patent would still be owned by the patentee company. In this case, the company that reported the highest estimate is required to pay the amount equivalent to the second highest estimate, while the company that reported the second-highest estimate is required to pay the amount equivalent to its own estimate.

If a patent is purchased and placed in the public domain, the non-patentee companies can also produce goods. In this case, it is assumed that the three companies would engage in

Cournot competition and that the price of goods would be determined based on the (inverse) linear demand function. It is also assumed that each company produces goods at a constant marginal cost and that each company would be able to fully know each other's marginal cost. Under these circumstances, each company engages in profit-maximizing production.

If a patent is not purchased, only the patentee company would produce goods. The price of the goods would be determined based on the (inverse) linear demand function. The patentee company produces goods at a constant marginal cost. Under these circumstances, the patentee company engages in production that will maximize profits.

1 Action taken by the patentee company

First, this section examines the action that the patentee company would take in response to the patent purchase price proposed by the government. If the government's proposal is accepted, the patentee company gains profits in the market as well as the amount of money equivalent to the patent purchase price. It should be noted that, even after the patent is purchased and placed in the public domain, the patentee company would be permitted to produce goods. On the other hand, if the government's proposal is refused, the patentee company would only gain profits in the market.

In this case, if the patent purchase price proposed by the government is larger than the discrepancy between the estimated profits when only the patentee company can produce goods and the estimated profits when each company can produce goods, the patentee company would accept the proposal. If it is smaller, the patentee company would refuse the proposal. Here we assume that if the government-proposed patent purchase price is equivalent to the abovementioned discrepancy, the patentee company would accept the proposal.

2 Action taken by the non-patentee companies

Next, this section discusses the kinds of reports that the non-patentee companies would submit to the government. It is assumed that the non-patentee companies are symmetric and that the non-patentee companies report the same estimate. In this case, it would be sufficient to examine either of the two non-patentee companies.

The non-patentee company would report an estimate of the patent value in consideration of the action that the patentee company would take in response to the government's proposal. Consequently, the estimate of the patent reported by the non-patentee company would be the same as the discrepancy between the estimated profits when only the patentee company can produce goods and the estimated profits when each company can produce goods, provided, however, that the non-patentee company would prefer obtaining zero profits when the patent is purchased rather than obtaining zero profits when the patent is not purchased.

Let's assume that the non-patentee company reports a slightly higher estimate than the one presented in the aforementioned report. In this case, even if the non-patentee company reports a slightly lower estimate, the patent would be purchased. Furthermore, the non-patentee company's payment for the patent purchase price would become lower than the current level. In other words, by reporting a slightly lower estimate than the current level, the non-patentee company could increase profits. Therefore, neither non-patentee company would report an estimate that is slightly higher than the one presented in the aforementioned report.

Next, let's assume that a non-patentee company reports an estimate that is lower than the one presented in the aforementioned report. In this case, even if an estimate that is slightly lower than the current level is reported, the patent would not be purchased. However, a non-patentee company's payment for the patent purchase price would become smaller than the current level because a non-patentee company is required to pay the government the amount equivalent to its own estimate. By reporting an estimate that is slightly lower than the current level, the non-patentee company could increase profits. Therefore, the non-patentee company would not report an estimate that is lower than the one presented in the aforementioned report.

Finally, let's assume that a non-patentee company is the one that submits the aforementioned report. In this case, even if a non-patentee company submits an estimate that is slightly lower than the current level, the government would adopt as the patent purchase price the estimate reported by the other non-patentee company. Therefore, the non-patentee company's currently-considered payment for the patent purchase price would

remain the same as the current level. Meanwhile, if a non-patentee company reports an estimate that is slightly lower than the current level, the government would adopt as the patent purchase price the currently-considered estimate reported by the non-patentee company, the patent would not be purchased. In sum, a non-patentee company would obtain zero profits by reporting an estimate that is slightly lower than the current level. Therefore, neither non-patentee company reports an estimate that is lower than the current level.

The estimate presented in the aforementioned report would be the lowest patent purchase price acceptable by the patentee company. It should be noted that the action of the non-patentee company is predicted based on the assumption that the non-patentee company's share of the payment for the patent purchase price satisfies certain conditions. Thus, if this assumption is false, the non-patentee company would not submit the aforementioned report. Consequently, the patent would not be purchased.

3 Evaluation of the patent purchase system

As discussed in the preceding section in a case where only one non-patentee company exists, this section examines whether the existence of a patent purchase system could reduce social inefficiency. In order to evaluate the effect of the patent purchase system, a formula has been established by using the change in social surplus and the government's payment for the patent purchase price. By making a comparison between a social surplus in a case where a patent has been purchased and a social surplus in a case where a patent has not been purchased, it is possible to determine whether the patent purchase system has reduced social inefficiency. It should be noted that, when a patent is purchased, each non-patentee company partially pays the patent purchase price.

If the result of the calculation according to the formula is non-negative, it may be interpreted that the patent purchase system has reduced social inefficiency. Otherwise, it would be interpreted that the patent purchase system has not reduced social inefficiency.

If a patent is purchased, both the non-patentee company and the patentee company are assumed to be able to produce goods at the same marginal cost. In this case, a patent purchase system generates a certain range for the share of payment for the patent purchase price in which social inefficiency would be reduced.

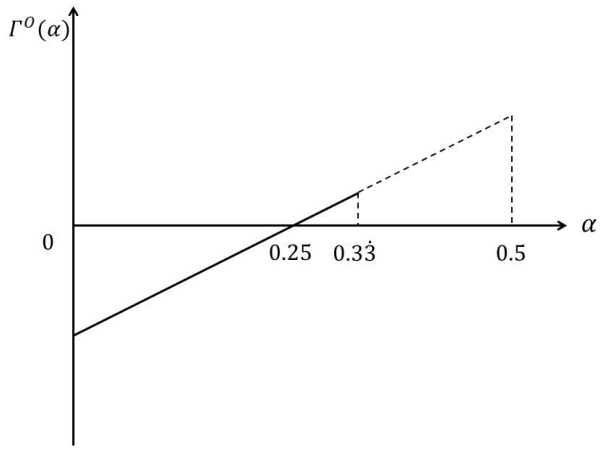

Figure II: Case where two non-patentee companies exist

In fact, if both the non-patentee company and the patentee company are able to produce goods at the same marginal cost, the change in social surplus is constantly positive. Therefore, the larger the non-patentee company's share of the payment for the patent purchase price is, the more significantly the existence of a patent purchase system would reduce social inefficiency. On the other hand, if the non-patentee company's share of the payment for the patent purchase price becomes excessively large, the non-patentee company would consider it more desirable if the patent is not purchased so that the company is not permitted to produce goods, rather than facing a situation where the patent is purchased so that the non-patentee company is permitted to produce goods.

This research has proposed a new system, i.e., a patent purchase system, and examined whether the use of a patent purchase system for the purpose of complementing the existing patent system could reduce the social inefficiency caused by the existing patent system. We have found that, in a case where two companies exist, i.e., one patentee company and one non-patentee company, the patent purchase price could be minimized if the government were to have the non-patentee company submit information on the patent and determine the patent purchase price based thereon, and were to have the non-patentee company partially pay the patent purchase price.

This research has evaluated the effect of a patent purchase system in consideration of the government's payment for the patent purchase price and the change in social surplus between

the two cases, i.e., the case where a patent is purchased and the case where a patent is not purchased. We have found that, in the case where a patent is purchased, if all the companies can produce goods at the same marginal cost, the greater the non-patentee company' share of the payment for the patent purchase price is, the more significantly the patent purchase system would reduce social inefficiency. This indicates not only that the non-patentee company's production of goods would promote competition and improve social surplus but also that the government's payment for the patent purchase price would be reduced. The same effects could be gained if two non-patentee companies existed but if the methods of determining and sharing the patent purchase price were altered.

However, it should be noted that the aforementioned findings were made on the assumption that the non-patentee companies can produce goods at such marginal cost that is at least the same as the patentee company's marginal cost. It is widely known that, if the marginal cost of non-patentee companies is excessively high, the change in social surplus would be negative. In other words, the existence of a patent purchase system would not reduce social inefficiency. Therefore, it would be necessary to devise a patent purchase system that would allow non-patentee companies to produce goods only if the change in social surplus is positive.

Reference

Kremer, M. (1998):"Patent buyouts: A mechanism for encouraging innovation."Quarterly Journal of Economics 113: 1137-1167.