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The Effect of an Environmental Policy as a source of a Background Risk on Economic Decisions

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환경정책에 기인한 외생적 불확실성이 경제적 의사결정에 미치는 효과

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국문요약

이 논문은 어떤 환경정책이 의사결정자들의 부(wealth)에 외생적인 위험을 증대시키는 경우 그러한 환경정책의 파급효과가 직접적으로는 상관이 없는 것으로 보일 수 있는 여타 경제적 의사결정에까지 미친다는 것을 기회향상모형을 통해 이론적으로 보인다. 이 논문에서 우리는 어떠한 환경정책에 의해 의사결정자들의 부에 외생적 위험이 커지는 경우 위험기피적인 의사결정자들은 여타 기회향상적 의사결정에서 보다 더 위험기피적으로 행동한다는 것을 입증하고, 이러한 결론이 환경정책의 수립과 시행과정에서 가지는 함의를 논의한다.

주제어 환경정책, 외생적 불확실성, 위험기피, 기회향상모형, 배출권거래제

Abstract

This short paper considers the situation where an environmental policy could play a source of an exogenous background risk at an individual's wealth and analyzes the effect of such a background risk on the individual's decision making in a simple chance-improving model. Our analysis shows that risks at initial wealth generated by an environmental policy could be regarded as an exogenous background risk in many cases and that such a risk makes a risk averse person behave more risk aversely in some restricted decision making situations. A policy maker considering an environmental policy which would affect individuals' initial wealth should take into account that the environmental policy could affect an individual's seemingly irrelevant economics decisions via his or her wealth.

Keywords Environmental policy, Background risk, Risk averse, Simple chance-improving model, Emission permit trading system

I Introduction

This short paper investigates that an environmental policy could play a source of an exogenous background risk in an agent's decision making problem. This implies that a change in environmental condition by a policy would affect his or her seemingly irrelevant economic decision making under risk.

As an illustration, suppose a person who wants to decide how much he or she invests to a risky asset. Furthermore, suppose that he or she has a house which consists of his or her initial wealth. Assume that the price of the house is certain and stable at the moment. Thus, when he or she makes his or her financial decision, the price of the house is already incorporated into his or her initial endowment for the financial decision. Now suppose that the price of the house is not certain but risky with a known probability distribution by an environmental or development policy. Assume that the expected price of the house is equal to the original certain price, which means that the risk is a mean preserving spread. The mere fact that it is risky would affect his or her financial decision making via the generated riskiness of his or her initial endowment only if his or her preference is not risk neutral.

In fact, many environmental conditions and policies are a source of risk in the initial wealth for an economic decision making. A health risk induced by a change in environmental condition is a clear example of it. In the case that the decrease of wealth by the health damage trades off with an increase of wealth by the other factor, the wealth could be under a mean-preserving risk. A national development project usually generates both the possibility of a direct wealth increase or decrease for people who live in the corresponding region. However, the possible environmental damage by the project would lead to a potential decrease of the wealth. Thus, such a development project which would affect environment could be a source of risk at a person's initial wealth. In many cases, an environmental policy brings a clear and certain effect on an individual's wealth. For example, a greenbelt

policy would decrease the wealth of the individuals who has real estates at the area.

In this paper, we present a simple model illustrating that the riskiness in an environmental good or condition could affect a person's general economic decision making under risk if he or she is risk averse.[1] More specifically, we present a simple model where a generated riskiness in an environmental condition (or good) makes a risk-averse person behave more risk aversely in his or her exogenous decision making (e.g., a financial decision making) under risk. In the course, we also analyze the effect of the change of wealth on his or her exogenous decision making under risk.

Though our results would be specific to the particular decision situation of our model, it is important in that the riskiness of environmental condition could potentially affect a person's economic decisions making under risk (e.g., portfolio buildings, investment-saving decisions, reservation wage decision) which are seemingly irrelevant to the environmental policy. Moreover, the decision situations which our model covers would include some important one such as the decision of one's reservation wage or reservation price. Thus, our result would imply that a policy related to a particular environmental condition may not only affect to it but also to a general circumstance of various economic decision making only if the environmental condition affects an individual's initial wealth.

For this purpose, we extend and generalize the results of Lee (2008) using a relaxed assumption. While there are some theoretical studies on the effect of the background risk, the general results are not unambiguous and depend on the model (Pratt and Zeckhauser (1987), Kimball (1993), Eeckhoudt et al. (1996), Gollier and Pratt (1996), McGuire et al. (1991)). While our intuition suggests that a risk averse person would always behave more risk aversely when a background risk at initial wealth exists, the theoretical studies show that such intuition is not always true. For instance, Gollier and Pratt (1996) show that a risk averse person can increase the

1) Of course, this can be applied to a risk loving person. However, it is widely known that most people are risk averse. Thus, we focus on a risk averse person's behaviour.

portion of a risky asset under the existence of the background risk at initial wealth. Thus, verifying the conditions and categorizing the decision situations where an unambiguous prediction can be made is an important theoretical issue. Our simple chance-improving model provides unambiguous predictions while it could be applied to limited real applications. However, it should be noted that the limited real applications could include important economic decisions for a reservation wage, a reservation price, a reservation rebate and so on.

Section 2 presents our simple model and the basic results, and the key findings are illustrated in Section 3. An illustration of the key findings is presented in Section 4 and the implications on an economic policy are discussed in Section 5. Conclusion follows in Section 6.

Ⅱ The model

We follow a simple chance improving model (Lee (2008)) for the analysis. This is a very simple decision making model under risk. A person faces a situation where he or she needs to give-up among potential outcomes in order to increase the winning probability. Here, the winning probability increases with the giving-up amount. For example, a job searcher's chance to get a job would increase if he reduces his or her reservation wage.

Our concern in this paper is to investigate how a person behaves in the simple chance improving situation if there is a change of environmental condition which affects his or her initial wealth. For the purpose, it is important to incorporate environmental endowment into the initial wealth and to rationalize it. In general, wealth can be defined by the sum of income and assets as follows:

$$w_0=Y+A$$
$$A=a_0+a_1(e)$$

Here we assume that a person has no risky asset at the moment, and the income Y is also certain. We crucially assume that the certain assets can be divided according to whether it is affected by an environmental condition or not: a_0 is not affected but a_1 is affected. For example, we could regard a_0 as cash in hand and a_1 as the price of the house in which he or she lives. In general, the price of the house is affected by the environmental conditions surrounding it. So, if there is no risk in the environmental conditions, then we could assume that his or her environmental endowment has no risk and hence the asset a_1 does not have a risk, too. Now, assume that the environmental conditions become risky and hence a_1 also becomes risky in the mean preserving spread way. Then, a_1 becomes a random variable:

$$\tilde{A} = a_0 + \tilde{a_1}$$

where $E(\tilde{a_1}) = a_1$, thus $E(\tilde{A}) = A$.

As a result, the initial wealth w_0 also becomes risky:

$$\tilde{w} = Y + \tilde{A}$$

where $E(\tilde{w}) = Y + E(\tilde{A}) = Y + A = w_0$.

For clarity and simplicity of our analysis, we can rewrite this relationship as $\tilde{w} = w_0 + \varepsilon$ where ε is a mean preserving spread parameter such that $E(\varepsilon) = 0$.

The assumption that an environmental risk would cause a risk to the initial wealth via a particular environment condition related to a particular asset is critical for the analysis as it will be clear later. This assumption would not be so strong and unrealistic since our daily life experiences such relationship between an environmental condition and the assets. For example, we want to object against constructing a factory near our home or water basement: because it brings a risk to reduce the price of our house via the negative effect on health of the residents.

Note that this is a basic rationale of the well known hedonic price method used for environmental valuations.

Now, we are prepared to apply Lee (2008)'s simple chance improving model to our analysis. This model could have a restricted practical application to a real world decision making situations: that is, the level of the initial wealth is not affected by the decision in this model. In other words, this model could only capture the situations where there is no loss of the initial wealth by the current decision. While there are a lot of situations which this model could not cover, this model would still capture some important economic decision making situations such as a job searchers' decision of a reservation wage in labour markets.[2)]

In this model, a decision maker faces an exogenous chance to decide how much he or she gives up among a potential payoff. If he or she wins, then he or she takes the difference between the maximum potential payoff and the giving-up amount, and gets nothing otherwise. Crucially, the giving-up amount and the winning probability has a positive relationship. So, his or her task is to decide the giving-up amount by which his or her expected utility is maximized.

We can denote his or her initial wealth by w_0, the pre-defined maximum potential gain by z and the giving-up amount by x. Thus $x \in [0,z]$, and his or her final payoff or outcome will be w_0+z-x if he or she wins. Otherwise, his or her final payoff will be w_0. Letting u(.) a von Neuman-Morgenstern utility function and $p(.)$ the winning probability where $p'(x)>0$ and $p''(x) \leq 0$, we can construct his or her expected utility maximization problem:

$$Max_{\{x\}} \; EU=p(x) \cdot u(w_0+z-x) + (1-p(x)) \cdot u(w_0) \qquad (1)$$

$$where \; u(.)>0, \; u'(.)>0, \; and \; u''(.) \leq 0.$$

2) The reason why the model is not applied to every decision making situations is explained on pp.4. That is, the effect of the background risk on a decision making in general depends on the specific decision making situations. See Pratt and Zeckhauser (1987), Kimball (1993), Eeckhoudt et al. (1996), Gollier and Pratt (1996) and McGuire et al. (1991).

Lee (2008) restricted $p(.)$ to a uniform distribution. In this paper, we generalize the analysis: we do not restrict $p(.)$ to a particular functional form only if it satisfies the conditions $p'(x)>0$ and $p''(x)\leq 0$. These assumptions may not be too strong: for example, as a job searcher reduce his or her reservation wage, the probability getting a job would increase $(p'(x)>0)$, and the increment of the probability would not increase as the reservation wage is reduced $(p''(x)\leq 0)$.

Solving the first order condition leads to the following relationship:

$$(u(w_0+z-x)-u(w_0))/u'(w_0+z-x) = p(x)/p'(x). \quad (2)$$

It is easy to show that our assumptions on $p(x)$, $u(.)$ are sufficient for the maximization problem. From (1), we can derive Lemma 1.

Lemma 1) A risk neutral person's optimized giving-up amount satisfies that $x_N=M-p(x_N)/p'(x_N)$.

Proof) From (1), $u(w_0+M-x)-u(w_0)-(p(x)/p'(x))\cdot u'(w_0+M-x) = 0$. Now suppose a risk neutral person. For him or her, the following relationship always holds: $u'(w_0+M-x_N)=(u(w_0+M-x_N)-u(w_0))/M-x_N$. Hence, $u(w_0+M-x_N)-u(w_0)-(p(x_N)/p'(x_N)) \cdot (u(w_0+M-x_N)-u(w_0))/M-x_N = 0$ should be satisfied. Rearranging this leads to $(M-x_N-p(x)/p'(x)) \cdot (u(w_0+M-x)-u(w_0)) = 0$. Since we assume $0<x<M$, $M-x_N-p(x_N)/p'(x_N)$ should be equal to zero to satisfy the condition. Thus, $x_N=M-p(x_N)/p'(x_N)$ should be satisfied. Q.E.D.

Ⅲ Propositions

Using (1) and Lemma (1), we can derive the following Proposition 1. Proposition 2 can be directly derived from Proposition 1.

Proposition 1) A risk averse person's optimized giving-up amount is larger than a risk neutral persons' one. That is, $x_A > x_N$.

Proof) A risk averse person's utility function satisfies

$u'(w_0+h)<(u(w_0+h)-u(w_0))/h.$ (3)

for any nonnegative h. Let us denote his or her FOC by $D(x_A)=0$. Consider $D(x_N)=D(M-p(x_N)/p'(x_N))=u(w_0+p(x_N)/p'(x_N))-u(w_0)-(p(x_N)/p'(x_N))\cdot u'(w_0+p(x_N)/p'(x_N))$. *Let* $h = p(x)/p'(x)$. *Then, it can be shown that* $D(x_N) > 0$ *from (3). Thus* $D(x_N) > D(x_A)$. Since $dD(x)/dx < 0$ by the second order condition, we can find that $x_A > x_N = M-p(x_N)/p'(x_N)$.

Proposition 2) As a risk averse person becomes more risk averse, his or her giving-up amount becomes larger.

Proof) Define $v=k(u(.))$ *where* $k(.)>0$, $k'(.)>0$ *and* $k''(.)<0$. *Note that* $k(u)/u > k'(u)$ since k(.) is concave. Then v is more risk averse than u. Our proof is completed if show that the giving-up amount of the person v is larger than that of u. Solving v's maximization problem generates the first order condition $H(x) = p'(x)\cdot(u(w_0+M-x))-p(x)\cdot u'(w_0+M-x)\cdot k'(u(w_0+M-x))-p'(x)\cdot k(u(w_0)) = 0$. Now put $x=x_A$ which was the solution of $D(x_A)=0$ into $H(x)$:

$H(x_A)=p'(x_A)\cdot(u(w_0+M-x_A)) - p(x_A)\cdot u'(w_0+M-x_A)\cdot k'(u(w_0+M-x_A)) - p'(x_A)\cdot k(u(w_0))$. (4)

Let $u(w_0+M-x_A)=u_A$, $u(w_0)=u_0$ *and* $H(x_A)=H_A$ *where* $u_0<u_A$, Then, we can rearrange (4):

$HA=p'(x_A)\cdot(k(u_A)-k(u_0))-p(x_A)\cdot u_A'\cdot k'(u_A)$. (5)

Note that $D(x_A)=0$. This implies

$p(x_A)\cdot u_A'=p'(x_A)\cdot(u_A-u_0)$ (6)

Putting (6) into (5),

$H_A=p'(x)\cdot(k(u_A)-k(u_0)-(u_A-u_0)\cdot k'(u_A))$. (7)

Since $k'>0$, $k''<0$, $u_A>u_0>0$ and $p'>0$, we get $H_A > 0$. That is, if we put x_A which was the solution of $D(x_A)=0$ into $H(x)$, then we get $H(x_A)>0$ which is not a maximum. It is easy to check that the second order condition of $H(x)$, $H''(x)<0$. Thus $H(x_A)>0$ implies that the optimal xA' which would satisfy $H(x_A')=0$ should be larger than x_A:

$x_A' > x_A$. That is x_A' for a more risk averse person v is larger than x_A for a risk averse person u. Hence, more risk averse person would give up more.

Q.E.D

Now we check what the effect of increasing wealth on a risk averse person's giving-up decision. Our third proposition suggests that decreasing absolute risk aversion (DARA) is a necessary and sufficient condition for an increase of initial wealth w_0 to reduce the optimal giving up amount.

Proposition 3) If a risk averse person has DARA preference, then the optimal giving-up amount x* becomes larger as the initial wealth w_0 increases.

Proof) Note that DARA implies $u''<0$, $u'''>0$, and $v=-u'$ is more risk averse than u. It is easy to check that v is a concave increasing function. Suppose risk averse persons whose preference satisfies DARA. Consider the problem of the risk averse person u. Recall that $D(x^*) = p'(x^*)\cdot u(w_0+M-x^*)-p(x^*)\cdot u'(w_0+M-x)-p'(x^*)\cdot u(w_0) = 0$. Thus,

$$dD(x^*)/dw_0 = p'(x^*)\cdot u'(w_0+M-x^*)-p(x^*)\cdot u''(w_0+M-x)-p'(x^*)\cdot u'(w_0). \quad (8)$$

Now consider the problem of the more risk averse person v. Then $I(x^{*\prime}) = p'(x^{*\prime})\cdot v(w_0+M-x^{*\prime})-p(x^{*\prime})\cdot v'(w_0+M-x^{*\prime})-p'(x^{*\prime})\cdot v(w_0)=-(p'(x^{*\prime})\cdot u'(w_0+M-x^{*\prime})-p(x^{*\prime})\cdot u''(w_0+M-x^{*\prime}) - p'(x^{*\prime})\cdot u'(w_0)) = 0$. Since $u''<0$ *and* $u'''>0$, we get $v'>0$ and $v''<0$. Thus it is easy to show that the second order condition $dI/dx < 0$. Moreover, recall that $x^{*\prime} > x^*$ from Proposition 2. These imply $I(x^*)>0$. Hence, we can show that $I(x^*) = -(p'(x^*)\cdot u'(w_0+M-x^*)- p(x^*)\cdot u''(w_0+M-x^*)- p'(x^*)\cdot u'(w_0))= -dD(x^*)/dw_0 > 0$ using (8). Thus we can find that $dD(x^*)/dw_0 <0$. This implies that as w_0 increases, $D(x^*)$ decreases and hence $D(x^*) < 0$. Thus x^* should decrease in order to recover $D(x) = 0$ since $dD(x)/dx < 0$ by the second order condition. Suppose that the risk averse person u's preference does not satisfy DARA. This implies that u''' is not anymore larger than 0. Thus, $dI/dx< 0$ *(i.e.,* $x^{*\prime} > x^*$*)* is not satisfied anymore. Hence, $I(x^*)=-dD(x^*)/dw_0 > 0$ is not hold anymore.

Our final proposition suggests that an exogenous risk at the initial wealth induced by an environmental risk induce more risk averse person to give up more among potential outcomes. This does not depend on the property of $p(.)$. Thus the proposition and its proof are identical to that suggested by Lee (2008).

Proposition 4) Lee (2008)

Suppose that an environmental risk induce a mean-zero independent background risk at initial wealth w_0, is $w_\varepsilon = w_0+\varepsilon$ where $E(\varepsilon)=0$. If $u'''>0$ (i.e., DARA) and $u''''<0$ (i.e., DAP: decreasing absolute prudence) at every initial wealth level, a risk averse subject whose initial wealth is under the exogenous background risk will give up more than one whose initial wealth does not have any risk. That is, $x_\varepsilon > x_A$ for every wealth level where x_ε denotes the optimal x under the background risk and x_A denotes the optimal x in the case that there is no background risk.

Proof) See Lee (2008).

Ⅳ An illustration of Propositions

For an illustration of our propositions, consider a risk averse unemployed person whose preference follows DARA and DAP.[3] Suppose that he or she has a house as an asset and searches for a job. Now suppose that a CNG gas station is planned to be built near his or her house. Then, what is the effect of such a plan on his or her job search behaviour?

3) Note that our proposition suggests that a risk neutral person would not change his optimal decision as his or her initial wealth changes.

First, assume that it is known that the price of the house certainly falls as the direct effect of the plan. Then, it is clear that his or her wealth certainly decreases. But is it the end of the story? Our Proposition 3 suggests that it is not. As the wealth decreases, he or she tries to give up more among potential outcomes. This implies that his or her reservation wage for taking a job would decrease. The plan affects his or her decisions related to a job.

Second, assume that the direction of the price change of the house is not certain: it could rise due to a possible further development or fall due to a possible environmental damage. That is, building the gas station could bring a mean-zero risk at wealth. Then, our Proposition 4 suggests that this risk also changes the decision for a job. He or she would try to reduce his or her reservation wage to increase the chance for getting a job.

V Implications on environmental policies

Applications of our propositions are not restricted to an environmental policy as a referee correctly points out: those are applied to any situation or for any policy only if it meets the conditions for the chance-improving model. Thus, it would be helpful to specifically illustrate the implications of our main proposition (i.e. Proposition 4) on an environmental policy.[4)]

It would be clear from Proposition 4 that if an environmental policy could remove a background environmental risk which affects a decision maker's initial wealth, the evaluation of the policy should not only account of the direct value from removing such an environmental risk but also the possible indirect values from the changes

4) We do not focus on the implications of Proposition 3 on an environmental policy in this paper. However, it is easy to find out that most environmental policies such as an emission charge and a direct regulation based on emission standards could reduce a firm's initial wealth. Thus, it would be clear that the firm would behave more risk aversely in the chance improving decision making situations if it is risk averse with DARA preference. This implies that the firm would prefer an investment project with a more probable but less payoff only if the investment project guarantees no loss at the firm's initial wealth.

of economic decisions induced by the removed background risk. For example, suppose a risk averse job searcher with DARA and DAP preference who lives in an industrial area where his or her initial wealth is affected by the environmental risk. There would be two possible situations according to the kind of the environmental risk. First, there could be only a downside environmental risk where it is defined in $(-\infty, 0)$. For instance, the house price could be at a downside risk induced by a dirty air. This implies $E(\tilde{w}) < w_0$ where $\tilde{w} = w_0 + \varepsilon$ and $\varepsilon \in (-\infty, 0)$. Suppose that the individual's reservation wage was r1 under the downside environmental risk. Proposition 3 predicts that an environmental policy removing such a risk (e.g. regulations on emission of dirty air) would increase his or her reservation wage. That is, the reservation wage under the environmental policy removing such a risk, r_2, would be larger than r1. Second, the initial wealth could be at a mean-zero risk. For instance, the house price could be at a mean-zero risk due to the trade-off between the environmental risk and the benefit from industrialization. Then $E(\tilde{w}) = w_0$. Proposition 4 predicts that the individual's reservation wage would increase if the environmental policy removes the environmental risk. Thus, a policy removing an environmental risk which can affect initial wealth would increase a job searcher's reservation wage. Such an indirect effect of the environmental policy should be accounted for the evaluation of the policy.

While some environmental policies can remove the background risk which exists due to an environmental risk, it is also possible that an environmental policy brings about a background risk. An environmental policy could lead to a background risk at initial wealth by two different ways. First, if an environmental policy which could affect initial wealth is planned but delayed without confirmation, it could bring about a background risk at a decision maker's initial wealth. For example, suppose that abolishing a greenbelt on an area is planned but the implementation is delayed without confirmation. At the moment when the plan is known, the price of real

estates on the area would arise. Then, it could bring about a risk at initial wealth since the price of a house or a real estate would further increase if the plan is implemented but the price would fall if the plan is not implemented. In this case, our Proposition 4 suggests that the delay would affect the behaviour of a risk averse job searcher who has a real estate in the area by reducing his or her reservation wage. If a government wants to minimize this indirect effect, it should minimize the delay.

More importantly, an environmental policy itself could generate a background risk. An important example would be the emission permit trading system. A firm can participate to the emission permit market and trade the emission permits under the emission permit trading system. A firm could face a risk at initial wealth since the future price of the emission permit is in general not certain. Thus, it is possible that the emission permit trading system generates a background risk at the firm's initial wealth. Suppose that the firm initially has remaining emission permits of e with the current price of p. Then the firm's initial wealth is $w = w_0 + p \cdot e$ where w_0 denotes the other wealth components than the emission permits. Denote the random future price of the emission permit by $\tilde{p}$ and assume $E(\tilde{p}) = p$. Then the firm's wealth faces a background risk: $\tilde{w} = w_0 + \tilde{p} \cdot e$ where $E(\tilde{w}) = w_0 + p \cdot e$. Its consequence is that the policy could affect the firm's general investment decisions which meet the conditions of the chance improving decision situations and are not directly related to the emission problem. Specifically, suppose that the firm is risk averse with DARA and DAP preferences and that it is to choose an investment project in an investment project set. Assume that any investment project in the set guarantees a non-negative net profit and the probability *(q)* winning the potential net profit (π) is negatively related to the potential net profit (i.e. $q'(\pi)<0$) and $q''(\pi)<0$. These assumptions would not be too strong: that is, a low π would imply that the project would be an easy one to achieve, and the increment of the chance would become diminish as π decreases. Denote the choice set $m = \{m_1, m_2, ..., m_N\}$

where i=1, 2, ⋯, N and $m_i = (\tilde{w} + \pi_i, q_i; \tilde{w}, 1-q_i)$ is a combination of the potential net profit π and its winning probability q.[5]) Noting the negative relationship between π and q, suppose that the potential net profit decreases and the winning probability increases as i increases. That is, mj would be a more conservative (i.e. a more risk averse) investment project than mk if j > k. Our Proposition 4 suggests that the firm, which chooses an investment project mk when there is no price risk under the emission permit trading system, would choose a more conservative investment project mj if the price of the emission permit is at a mean preserving risk under the system. It would be easily shown that if the firm is risk neutral, its decision on the investment project is not affected by the background risk generated by the uncertainty of the price of the emission permit. Thus, if a government, which wants to implement the emission permit trading system, would need to consider a firm's risk attitude. If a firm is risk averse, then the government would also need to consider the indirect effect which could be generated by the emission permit trading system on the firm's general investment decisions. That is, the possible price uncertainty of the emission permit would change the decisions on general investment projects which seems to be irrelevant to the emission activity if the firm is risk averse with DARA and DAP preferences. In this case, the government may need to consider the way which could stabilize the price of the emission permit. If the banking system and the share system can stabilize the price of the emission permit through periods as suggested by some experimental studies (Godby et al. (1997), Muller (1999)), these systems could not only improve the efficiency of the market but also prevent firms' general investment decision from changing to a conservative one in the decision making situations depicted above.

5) Note that this is just an alternative and discrete representation of the chance improving situation model.

Ⅵ Conclusion

In this paper, we extend the results in Lee (2008) and apply those to environmental policies. We also generalize those relaxing the assumption on $p(.)$. The implication of this paper is simple and clear: if an environmental policy brings about the change of a person's wealth, or if it brings about the risk at the person's wealth, then his or her other economic decisions would be affected by the environmental policy in some situations. A more specific prediction is that a risk averse person whose preference follows DARA and DAP would behave more risk aversely and give up more among potential outcomes when he or she faces a simple chance improving situation such as job search decision making and decision on a particular investment project where its potential payoff is negatively related to its success probability and it guarantees a non-negative net profit.

An environmental policy could change a person's general economic decisions in some situations only if it changes an environmental condition and such a change of the environmental condition affects his or her initial wealth.

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