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On the social welfare analysis of rent-seeking versus other profit-seeking

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Abstract

This paper is a comparative analysis of social welfare under the conditions of relative investment of rent-seeking, other profit-seeking, and simultaneous mixed wasteful investment undertaken under uncertainties of the future. It shows that a clearer Cournot-Nash equilibrium of Pareto-inferior results due to a generation of social loss rather than social surplus in investment in the wasteful sectors in competition with identical agents in society.

1. Introduction

Research literature on the rent-seeking theory of agents, which well defines and develops its behavior has become both extensive and deep. If rent-seeking seems to be the only mechanism available to agents attempting to increasing welfare through gain or avoidance of a loss due to uncertain future events, then agents often have at their disposal alternatives to rent-seeking. Thus, it may attempt to provide them with another means of condition profit maximization. So that, one of them either attempts to aviod a potential rent loss, or try to obtain a rent through rent-seeking investment.

In particular, the aim of this paper is to analyze critically the recent literature on rent-seeking and directly unproductive profit-seeking in social activities. This corroborates with the related to literature on rent-seeking and on investment in other production line flexibility. It is argued that a clearer understanding of wasteful competition in social welfare emerges if the framework of the constitutional increase social cost in the economy is adopted in all agents. It is furthermore argued that a dynamic economic model framework is most suitable to analyze wasteful competition in investment game unproduction of agents the society.

Therefore, agents' competitive rent-seeking or non rent-seeking behavior is recognized as a factor which must be analyzed along with the social loss associated with market failure. Thus, the total cost of social waste transferring of wealth rather that its creation, and the use of production resources to obtain this transfer creates a social loss greater than its social benefit to society. This paper is organized as follows: Chapter 2 sets out an extension of the utility function of an agent under the absolute risk aversion. Chapter 3 analyzes Cournot-Nash equilibrium under conditions of rent-seeking investment[1], other profit-seeking, and finally, under the two simultaneously. Chapter 4 analyzes social welfare according to change in the firm number, n, and coefficient of risk aversion, r. Chapter 5 offers some concluding remarks.

2. Utility Function of Agents

(1) Attitudes toward agents' risk in activities operating under the condition of uncertainty of his future utility.

Throughout this paper, we will assumed that society consists of a fixed member, finite number of agents (firms), n, and that agents' preferences of individuals public choice are weak orders (i.e., R_i is complete, transitive, reflexive, monotone, acyclicity) under uncertainties of his future utility. That is, collective choice rules ; such a rule is a function, F, that may be profiles, or n-tuples of individuals' preference ordering of public choices into a set of binary relations. We show that formally, given a profile $(R_1,...,R_n)$, the social perference relation of public choice is given by $R=F(R_1,...,R_n)$. Furthermore, agents in the economy had axioms based on constant invetsment which were used to predict his choice of uncertainties in his game events in the future.

Axioms ;

a) completeness : $_AR_B$ & $_BR_C$ & $_AI_B$ & $_BI_C$. ($\forall$A, B, C)

b) transitivity : $_AR_B$ & $_BR_C \Rightarrow {_AR_C}$.

c) reflexity : $_AR_A$ & $_BR_B$ & cR_C. (for each choice bundle)

d) acyclicity : $_{A1}P_{A2}$, $_{A2}P_{A3}$,..., $_{At-1}P_{At}$, $\Rightarrow$ not $_{At}P_{A1}$.

e) monotonicity : if, $_AI_{iB} \Rightarrow {_AP'_{iB}}$ & $_AP_{iB} \Rightarrow {_AP'_{iB}}$, $_AP_B \Rightarrow {_AP'_B}$.

- R : the weak preference in a binary relation.
- P : the strict preference relation.
- I : the indifference relation in the usual way.

Therefore, we show an analysis of the attempt of maximization of the expected utility function of agents under uncertain game conditions of the future.

Assumptions ;

a) Single argument wealth is measured in monetary units.

b) Strongly additive and strictly increasing.

c) Continuous with continuous first- and second-order derivatives.

Consequently, the expected value in the lottery game (P, W_1, W_2) of agents under conditions of future, where agent's wealth W_i is different from the wealth level, will be the sum of the outcomes, each multiplied by the probability of the games occuring simultaneously ;

$E[W]=PW_1+(1-P)W_2$ ....(2-1)

- E[W] : the expected value of the lottery in (P, W_1, W_2).($P \in [0,1]$)

- W_i : wealth levels. (but different wealth levels of i exist)

(A) Risk neutral

$U[PW_1+(1-P)W_2]=PU(W_1)+(1-P)U(W_2)$ ....(2-2)

- the utility of the expected value of the lottery equals the expected utility of the lottery.
- a linear utility function of the from $U=\alpha+\beta W$. $(\beta>0)$

(B) Risk averter

$U[PW_1+(1-P)W_2]>PU(W_1)+(1-P)U(W_2)$ ....(2-3)

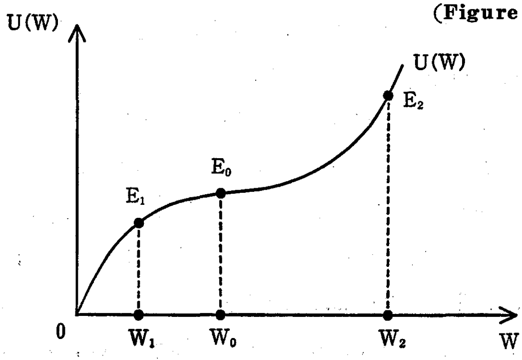
- the utility of the expected value of the lottery is greater than the expected value of its utility.
- if $d^2U/dW_2<0$, where the utility function is strictly concave and the agents are a risk averters. (Figure 2-1 ; $0\leqq W\leqq W_0$)
- this area extends from 0 to E_0 in (Figure 2-1).

(C) Risk lover

$U[PW_1+(1-P)W_2)<PU(W_1)+(1-P)U(W_2)$ ....(2-4)

- the utility of the expected value of the lottery is less than its expected utility.
- if $d^2U/dW_2>0$, where the utility function is strictly convex and the agents is a risk lover. (Figure 2-1 ; $W_0<W$)
- this area extends from E_0 to E_2 in (Figure 2-1).

(Figure 2-1)



Therefore, W_1 is a point of wealth loss in this lottery game. And W_2 is a point of wealth gain in this lottery game with future uncertainty. Futhermore, E_0 is a saddle point. Thus, the best outcome of risk averseness under conditions of future uncertainty is no greater than W_0 in this lottery game.

(2) Coefficient r of absolute risk aversion

Consequently, the agent's attitude, which appeared as the second derivative of the utility function provides an indication of his attitude toward the lottery.

$$r = -\frac{U'(W)}{U'(W)} = -\frac{d\ln U'(W)}{dW} \qquad \text{.......}(2-5)$$

- $r=0$; neutral toward risk.
- $r>0$; aversion from risk.
- $r<0$; prefers risk (risk lover).

Let, $V(W)=c+fU$. $(f>0)$. So that,

$$r = -\frac{V''(W)}{V'(W)} = -\frac{fU''(W)}{fU'(W)} = -\frac{U''(W)}{U'(W)} \qquad \text{.......}(2-6)$$

Thus, we rewrite (2-5) ;

$$-r = \frac{d\ln U'(W)}{dW} \qquad \text{.......}(2-7)$$

Now, we integrate with respect to W from (2-7) ;

$$\int -r\,dW = \int \frac{d\ln U'(W)}{dW}\,dW$$

$$\ln U'(W) = -rW + k_1 \qquad \text{.......}(2-8)$$

Where, k_1 is the constant of the first integration. Furthermore, we take the antilog from (2-8);

$$U'(W)=e^{k1}e^{-rW} \quad ....(2-9)$$

And, we integrate again from (2-9);

$$\int u'(W)dw=\int e^{k1}e^{-rW}$$
$$U(W)=e^{k1}\int e^{-rW}dW$$

$$=-\frac{e^{k1}}{r}e^{-rW}+k_2 \quad ....(2-10)$$

Where; k_2 is another constant of integration. Furthermore, from this we can perform a linear transformation using (2-10);

$$rU(W)-rk_2=-e^{k1}e^{-rW}.$$

$$\Rightarrow$$

$$\frac{r}{e^{k1}}U(W)-\frac{rk_2}{e^{k1}}=-e^{-rW}$$

$$\Rightarrow$$

$$-e^{-rW}=-\frac{rk_2}{e^{k1}}+\frac{r}{e^{k1}}U(W)$$

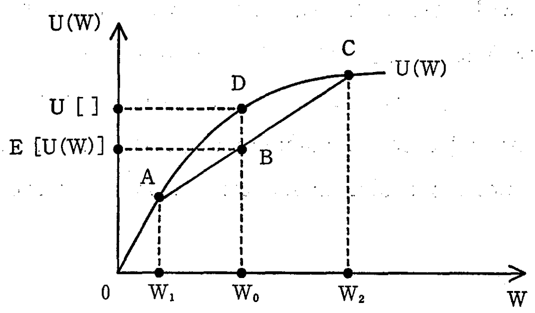
$$\Leftrightarrow$$

$$V(W)=c+fU.\ \left\{c=-\frac{rk_2}{e^{k1}},\ f=\frac{r}{e^{k1}}\right\}$$

$$\Rightarrow V(W)=-e^{-rW}$$
$$=-\exp(-rw).\ (r>0,\ W\geqq 0) \quad ....(2-11)$$

Thus, (2-11) is the expected utility function of a Von-Neumann Morgenstern, and r is the coefficient of absolute risk aversion. Therefore, we know be the general forms for a utility function of an agent with constant absolute risk aversion under uncertain outcomes of any future risk sensitive solution.

(Figure 2-2)



If the agents' payment amount is W_2-W_0, then his obtained wealth is W_0. Thus, the amount he will receive will always be wealth W_0. Furthermore, his possibility of obtaining large utility which amounts to benefits more of the expected value than average value of the lottery games under the absolute risk aversion under conditions of future uncertain behavior. $W_0D > W_0B$;

$$U[PW_1+(1-P)W_2] > PU(W_1)+(1-P)UW_2.$$

$$W_0D - W_0B = DB(\Rightarrow TB). \text{ (TB: total benefit).}$$

The index action of absolute risk aversion of agents is surely defined as the ratio of the second and first derivatives of the expected utility function. Agents with absolute risk aversion will require a premium to cover the risk involved in the uncertainty of future outcomes. All agents used in this paper have an absolute aversion to risk under uncertain expected utility gains in the future. And, the sure utility function of agents' actions used in this paper will always be linked to at least some cardinal utility function properties.

3. Cournot-Nash equilibrium in the model

All agents will attempt to maximize a Von-Neumann Morgenstern expected utility function (2-11) under conditions of future uncertainty. Thus, expected utility function shows that in some circumstances, it is possible to construct a set of numbers for particular agents that will be used to predict his choice under conditions of future uncertainty.

$$U(W) = -e^{-rW}$$
$$= -\exp(-rW). \ (r>0, W\geqq 0) \qquad \cdots\cdots(3-1)$$

If we now consider government expenditure cutback, then we see that there are industry reduction outputs due to the new level of government demand. Therefore, output in tâtonnement process of the industry will bring a surface reduction of the production of some firms. Thus, all agents use invested resources in an effort to maintain their places in the industry. Then, as we is know, these invested resources will also be in addition to social cost in the waste game. Thus, rent-seeking, profit-seeking and a mixture of the two are terms used by public choice scholars to describe socially wasteful competition under conditions of future uncertainty. A game-theory on this industry model shows that it will exist in non-cooperative Cournot-Nash equilibrium to the extent of a rent-dissipation which crucially depends on the (scale) return of individual expenditure of the two, rent-seeking, profit-seeking, when done simultaneously. So that ;

Assumptions ;

a) All firms are identical, and hence, make similar decision-making[2].

b) All firms' output is only sold to the government (public sector)[3].

c) All firms can switch the production line in the short run.

d) All firms are in the defense industry or a related subindustry.

e) Cost ; short run : X (rent-seeking) $\geqq$ C (profit-seeking), long run : C $\geqq$ X.

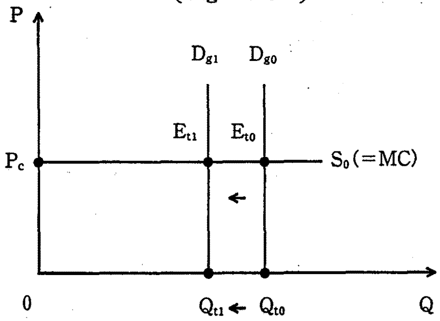
If reduction of government expenditure (demand) occurs ;

g_0 (government expenditure of initial) $\Rightarrow Q_{t0}$ (initial output of n firms).

$g_0 \rightarrow g_1\downarrow$. ($D_{g0} \rightarrow D_{g1}\downarrow$; $Q_{t0} \rightarrow Q_{t1}\downarrow$).

$\Rightarrow E_{t0} \rightarrow E_{t1}\downarrow$. ($Q_{t0} \rightarrow Q_{t1}\downarrow$; $n \rightarrow (n-1)\downarrow$).

(Figure 3-1)



· D_{g0} : total government demand of initial in this industry.

· E_{t0} : equilibrium of initial in this industry.

Thus, this expenditure cutback by the government will also cause a production decrease simultaneously for the firm and they will receive a lump sum subsidy S from government. (Pc (competition price) : $Q_{t0} \rightarrow Q_{t1}\downarrow$).

⟨structure of rent-seeking⟩

If cutback of government expenditure (demand) occurs ;

$g_0 \rightarrow g_1 \downarrow \Rightarrow D_{g0} \rightarrow D_{g1} \downarrow$. $(\Rightarrow Q_{t0}(n) \rightarrow Q_{t1}(n-1) \downarrow)$.

$\Rightarrow V \downarrow (+S \uparrow)$.

All firms are identical in decision-making under conditions of future uncertainty. Thus, firms will receive initial profit V and pay lump sum tax T. V (initial profit of firms)→ X (rent-seeking cost). ($X \leqq V$). Total social benefit; nV. Total social cost; nX.

$nX \leqq nV$.

$TC = \sum^n{}_{i=1} X_i$.

$X_i = X$. $\Rightarrow nX$. $\exists_i \in_n$.

⟨*structure of profit-seeking (production flexibility)*⟩

If reduction of government expenditure occurs;

$g_0 \rightarrow g_1 \downarrow \Rightarrow D_{g0} \rightarrow D_{g1} \downarrow$. $(\Rightarrow Q_{t0}(n) \rightarrow Q_{t1}(n-1) \downarrow)$.

$\Rightarrow V \downarrow (+S \uparrow)$. $(V > R)$.

Thus, government will announce a determined deduction in the amount expenditure, which some agents will use as determinants at the same time to plan strategies for behavior in the next period. Then, firms incur a potential profit-loss. Therefore, agents attempting investment of some form into insurance, do so to counter a close-down. Furthermore, firms receiving total profits, R, under another production line and total cost, C, switch to another production line, ($C \leqq R$, $R < V$). Then; Total social benefit; $(n-1)R$. Total social cost; $(n-1)C$.

$(n-1)C \leqq (n-1)R$.

$TC = \sum^n{}_{i=1} c_i$.

$c_i = c$. $\Rightarrow (n-1)c$. $\exists_i \in_n$.

⟨*structure in this game*⟩

If government determines an expenditure-cut in the next period;

(1)	⟨losing contract⟩	⟨winners contract⟩
	$n \rightarrow nX$(total loss: $X \leqq V$) $+S$	$(n-1) \rightarrow (n-1)V$(total profit) $-T$
	rent-seeking	not rent-seeking
(2)	⟨winners contract⟩	⟨losing contract⟩
	$n \rightarrow nV$(total profit) $-T$	$(n-1) \rightarrow (n-1)C$(total loss: $C \leqq R$) $+S$
	not flexibility	flexibility

Thus, we now introduce the probability of wining defined from, $\forall_i$, $_j \in _n$.

$$Z_j = \frac{X_j}{\sum^n{}_{i=1} X_i} \quad \text{.......(3-2)}$$

- Z_j : the probability of agents j winning in the contest.
- X_j : amount spent on rent-seeking by agent, j. ($\forall_i \in _n$, $\exists_j \in _n$).

$$P_j = a - bZ_j. \ (P_j \in [0, 1], \ \sum^n{}_{j=1} P_j = 1, \ \exists_j \in _n)$$

$$= a - b\frac{X_j}{\sum^n{}_{i=1} X_i} \quad \text{.......(3-3)}$$

- P_j : the probability of loss by agent, j, in the contract.
- If, $Z_j = 1/n$, then, $P_j = 1/n$. Thus, they are symmetrical.
- P_j is (linear) decreasing in Z_j, ($\exists_j \in _n$).

If, $Z_j = P_j = 1/n$, then we obtain the following;

$$\Rightarrow a = \frac{1+b}{n}. \ 0 < b \leqq \frac{1}{n-1}. \quad \text{.......(3-4)}$$

$$P_j = \frac{1+b}{n} - \frac{Z_j}{n-1}. \ \left(b = \frac{1}{n-1}\right)$$

$$= \frac{1-Z_j}{n-1} \quad \text{.......(3-5)}$$

Consequently, a bid for V of X_j yields expected profit ($E\pi$) in rent-seeking under probability Z_j of success of agent, j,

$$E\pi_j = Z_j V - X_j.$$

$$= \frac{X_j}{\sum^n{}_{i=1} X_i} V - X_j. \ (\forall_i \in_n, \ \exists_j \in_n) \qquad \text{.......(3-6)}$$

Therefore, the result we obtained derived from using (3-5), cost-benefits due to the amount of spending on rent-seeking from agent, j, against the expected wealth maximization in this game of all the agents.

1) we obtained derivative from using (3-5), the private optimal spending amount of investments of rent-seeking from agent, j, for maximization of his expected utility under conditions of future uncertainty.

$$\max_{x_j} EU_j = P_j U(I_j - X_j) + (1 - P_j) U(I_j + V_j - X_j) \qquad \text{.......(3-7)}$$

- I_j : initial wealth of agents, j.
- X_j : amount expenditure on rent-seeking of agents, j, ($\exists_j \in_n$).

If the probabile loss of agents, j, $P_j = 1/n$, ($\exists_j \in_n$) ;

$$\max_{x_j} EU_j = \frac{1}{n} U(I_j - X_j) + \frac{n-1}{n} U(I_j + V_j - X_j) \qquad \text{.......(3-8)}$$

Now, we analyze the investment in rent-seeking. Some agents will lose from a contract, the probability of loss is 1/n. And, agents who invest in rent-seeking will face damage equal to I−X with probability 1/n, as well as benefits equal to I+V−X with probability n−1/n. Thus, we can derive the equilibrium payment cost X* of investment under rent-seeking in this game.

$$-\frac{n-1}{n} e^{-r(I+V-T)} - \frac{1}{n} e^{-r(I+S)} = \frac{n-1}{n} e^{-r(I+V-X)} - \frac{1}{n} e^{-r(I-X)} \qquad \text{..(3-9)}$$

expected utility when no rent-seeking occurs

expected utility when X uses rent-seeking investment

If all agents are assumed to undertake identical activities in the future, then we can obtain the Cournot-Nash (C-N) equilibrium. In such a case, the optimal amount of total social cost is nX*, and the optimal equilibrium for private expenditure is X* into rent-seeking from (3 - 9) ;

$$\Rightarrow (n-1)e^{-r(I+V-T)}+e^{-r(I+S)}=(n-1)e^{-r(I+V-X)}+e^{-r(I-X)}.$$

$$\Rightarrow X^{*}=\frac{1}{r}\ln\left(\frac{(n-1)e^{rT}+e^{r(V-S)}}{(n-1)+e^{rV}}\right)$$

$$nX^{*}=\frac{n}{r}\ln\frac{(n-1)e^{rT}+e^{r(V-S)}}{(n-1)+e^{rV}} \qquad \text{.......(3 -10)}$$

2) we derive from using (3 - 5) the optimal amount of private spending of other profit-seeking (cost ; C, profit ; R) from agent, j, for maximization of his expected utility under conditions of future uncertainty.

$$\max_{c_j} EU_j = P_j U(I_j - C_j) + (1-P_j)U(I_j + R_j - C_j) \qquad \text{.......(3 -11)}$$

If the probability of loss for agent, j, $P_j = 1/n$, $(\exists_j \in_n)$;

$$\max_{c_j} EU_j = \frac{1}{n}U(I_j - C_j) + \frac{n-1}{n}U(I_j + R_j - C_j) \qquad \text{.......(3 -12)}$$

Now, we analyze investment under conditions of production flexibility. In this case, the probability that any on agent will lose from a contract is 1/n. Furthermore, an agent's production flexibility will face damage equal to I−C with a probability of 1/n, while reaping, benefits equal to the amount I+R−C with a probability of n−1/n. Furthermore, we can derive equilibrium payments using cost C* of investing into an agent's flexibile production of optimal choice enforcement.

$$-\frac{n-1}{n}e^{-r(I+V-T)}-\frac{1}{n}e^{-r(I+S)}=\frac{n-1}{n}e^{-r(I+R-C)}-\frac{1}{n}e^{-r(I-C)} \quad ..(3-13)$$

expected utility when there is no investment flexibility C. — expected utility when there is investment flexibility C.

Thus, we obtain the Cournot-Nash (C-N) equilibrium, in which equilibrium occurs between the optimal amount of total social cost $(n-1)C^*$, and the optimal amount of private expenditure C^* in investment on flexibile production from (3-13);

$$\Rightarrow (n-1)e^{-r(I+V-T)}+e^{-r(I+S)}=(n-1)e^{-r(I+R-C)}+e^{-r(I+C)}.$$

$$\Rightarrow C^*=\frac{1}{r}\ln\left(\frac{(n-1)e^{r(R+T-V)}+e^{r(R-S)}}{(n-1)+e^{rR}}\right)$$

$$(n-1)C^*=\frac{(n-1)}{r}\ln\left(\frac{(n-1)e^{r(R+T-V)}+e^{r(R-S)}}{(n-1)+e^{rR}}\right) \quad ....(3-14)$$

3) Finally, we analyze the simultaneous investment of rent-seeking and profit-seeking. In this case, some agent, j are derive using (3-5), for maximization of expected utility under condition of future uncertainty.

$$\max_{(X+C)j}EU_j=PU_j(I_j-X_j-C_j)+(1-P_j)U(I_j+V_j+R_j-X_j-C_j) \quad ....(3-15)$$

If, the probability lose of agent, j, $P_j=1/n$, $(\exists_j \in_n)$;

$$\max_{(X+C)j}EU_j=\frac{1}{n}U(I_j-X_j-C_j)+\frac{1}{n-1}U(I_j+V_j+R_j-X_j-C_j) \quad ....(3-16)$$

Thus, the probability that any agents will incur loss in a contract due to trying to meet the new level of government demand is 1/n. Furthermore, wasteful investment of both in this industry will result in loss equal to $I-X-C$ with a probability of 1/n, and benefits equal to the amount $I+V+R-X-C$ with a probability of $n-1/n$. Then, we can derive the equilibrium payment cost $(X+C)^*$ of simultaneously wasteful investment for agents.

$$\underbrace{-\frac{n-1}{n}e^{-r(I+V-T)}-\frac{1}{n}e^{-r(I+S)}}_{\text{expected utility when no wasteful investment occurs (X+C).}}=\underbrace{-\frac{n-1}{n}e^{-r(I+V+R-X-C)}-\frac{1}{n}e^{-r(I-X-C)}}_{\text{expected utility when wasteful investment occurs (X+C).}} \quad ..(3\text{-}17)$$

Hence, we obtain the Cournot-Nash (C-N) equilibrium, which becomes the optimal private amount of total social cost $n(X+C)^*$ and the equilibrium amount of private expenditure $(X+C)^*$ due to simultaneous wasteful investment (3-17) ;

$$\Rightarrow (n-1)e^{-r(I+V-T)}+e^{-r(I+S)}=(n-1)e^{-r(I+V+R-X-C)}+e^{-r(I-X-C)}.$$

$$(X+C)^*=\frac{1}{r}\ln\left(\frac{(n-1)e^{r(R+T)}+e^{r(V+R-S)}}{(n-1)+e^{r(V+R)}}\right)$$

$$n(X+C)^*=\frac{n}{r}\ln\left(\frac{(n-1)e^{r(R+T)}+e^{r(V+R-S)}}{(n-1)+e^{r(V+R)}}\right) \quad ....(3\text{-}18)$$

Therefore, with analyses (3-10), (3-14) and (3-18), we show that the path of Cournot-Nash due to the tâtonnement process in rent-seeking investments, profit-seeking investment, and simultaneous wasteful investment move simultaneously. Thus, under the tâtonnement process, there will be a convergence to the Cournot-Nash equilibrium from every starting point; that is, the Cournot-Nash equilibrium is globally stable in every investments under optimal welfare choice enforcement condition of future uncertainty of outcome solutions.

4. Social welfare in cost-benefit analysis

When all agents do not know the expected payoffs in their investment of the future, then the investment is said to be done with incomplete information. In such a case, the supply in this good-service industry will not rise due to the celebrated free-rider problems. If the good-service industry continues to invest, then each agent, in regard to his welfare (benefit), win prefer the other agents to incur the investment costs for supplying it. Now, some agents attempt to maximize their expected utility function under uncertainty of future strategic behaviour, with absolute risk aversion described by a Von-Neumann Morgenstern utility function. Therefore, attempts of this model use agents to maximize their expected utility of net present value (4-2) from (4-1);

$$PV_j = \frac{X_j}{\sum^n{}_{i=1} X_i}(-Ve^{-rWt}) - X_j. \quad (\forall_i \in_n, \ \exists_j \in_n)$$

$$= -Z_{jt}V_{jt}\exp(-rW_t) - X_{jt}. \quad (Z_t \in [0, 1]) \qquad \text{........(4-1)}$$

$$\max PV_j = \int (-Z_{jt}V_{jt}\exp(-rW_{jt}) - X_{jt})dt. \quad (r>0, \ \ W \geqq 0, \ \ \forall_t \in_n) \qquad \text{....(4-2)}$$

- r : the coefficient of absolute risk aversion.
- Z_{jt} : the possibile wins of agents j in time t, $(\exists_j \in_n)$.
- W_{jt} : the wealth of agents j in time t, $(\exists_j \in_n)$.
- X_{jt} : the expenditure cost of agents j in time t, $(\exists_j \in_n)$.

(1) Social benefit effect analysis due to a change in n

First we assume that agents simultaneously determine whether their actions will be in rent-seeking or non rent-seeking investment, in flexibile production investment or non-investment, in simultaneous wasteful investment. Then, we obtain a social welfare analysis due to comparing relative social costs of rent-seeking (4-3), other profit-seeking (4-4), and simultaneous wasteful investment, (4-5) from (3-10), (3-14), (3-18).

$$L_S = nX^* = \frac{(m+1)}{r}\ln\left(\frac{me^{rT}+e^{r(V-S)}}{m+e^{rV}}\right) \quad \cdots\cdots(4-3)$$

$$L_P = (n-1)C^* = \frac{m}{r}\ln\left(\frac{me^{r(R+T-V)}+e^{r(R-S)}}{m+e^{rR}}\right) \quad \cdots\cdots(4-4)$$

$$L_M = n(X+C)^* = \frac{(m+1)}{r}\ln\left(\frac{me^{r(R+T)}+e^{r(V+R-S)}}{m+e^{r(V+R)}}\right) \quad \cdots\cdots(4-5)$$

- $J = L_P - L_S$: the difference in social cost between wasteful activities.
- $m = (n-1)$: $\partial m/\partial n = \partial n/\partial m = 1$. (short run: $X \geqq C$, long run: $C \geqq X$).

Thus, we analyze the effect change of the agents, n, on L_S, L_P and L_C.

1) $\frac{\partial L_S}{\partial m} \equiv \frac{\partial L_S}{\partial n}$. $(m, n \in N)$.

$\Leftrightarrow$

$$\frac{\partial L_S}{\partial m} = \frac{1}{r}\left[\ln\left(\frac{me^{rT}+e^{r(V-S)}}{m+e^{rV}}\right) + \frac{(m+1)e^{rT}}{me^{rT}+e^{r(V-S)}} - \frac{(m+1)}{m+e^{rV}}\right] \quad \cdots\cdots(4-6)$$

If, $V>0$, $V>S$, $\frac{\partial L_S}{\partial m}>0$. $V=0$, $T<S$, $\frac{\partial L_S}{\partial m}>0$.

2) $\frac{\partial L_P}{\partial m} \equiv \frac{\partial L_P}{\partial n}$. $(m, n \in N)$.

$\Leftrightarrow$

$$\frac{\partial L_P}{\partial m} = \frac{1}{r}\left[\ln\left(\frac{me^{r(R+T-V)}+e^{r(R-S)}}{m+e^{rR}}\right)\right.$$

$$+\frac{me^{r(R+T-V)}}{me^{r(R+T-V)}+e^{r(R-S)}}-\frac{m}{e^{rR}+m}\Bigg] \quad \cdots\cdots(4-7)$$

If, $R>0,\ R>V-T,\ \frac{\partial L_P}{\partial m}>0.\quad R=0,\ T<V,\ \frac{\partial L_P}{\partial m}>0.$

3) $\frac{\partial L_M}{\partial m}\equiv\frac{\partial L_M}{\partial n}.\ (m,\ n\in N).$

$\Leftrightarrow$

$$\frac{\partial L_M}{\partial m}=\frac{1}{r}\Bigg[\ln\left(\frac{me^{r(R+T)}+e^{r(V+R-S)}}{m+e^{r(V+R)}}\right)$$

$$+\frac{(m+1)e^{r(R+T)}}{me^{r(R+T)}+e^{r(V+T-S)}}-\frac{(m+1)}{m+e^{r(V+R)}}\Bigg] \quad \cdots\cdots(4$$

If, $V>0,\ \frac{\partial L_M}{\partial m}>0,\ V=0,\ \frac{\partial L_M}{\partial m}>0.$

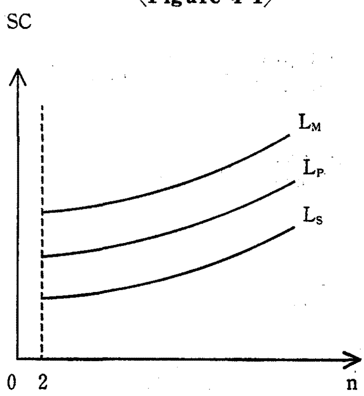
4) $\frac{\partial J}{\partial m}\equiv\frac{\partial J}{\partial n}.\ (J=L_P-L_S).\ (V>R)$

① $(V>R),\ \frac{\partial J}{\partial m}\equiv\frac{\partial J}{\partial n}\equiv\frac{\partial L_P}{\partial m}-\frac{\partial L_S}{\partial m}>0.$

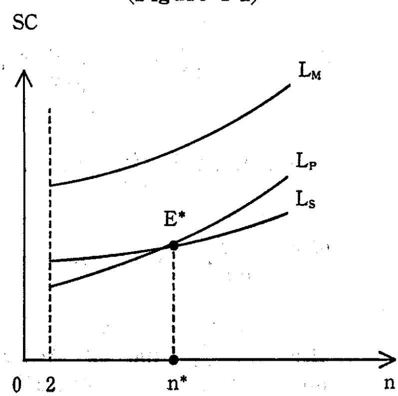
② $(X\geqq C),\ \frac{\partial L_S}{\partial m}-\frac{\partial L_P}{\partial m}\geqq 0.$ (short run)

③ $(X\leqq C),\ \frac{\partial L_S}{\partial m}-\frac{\partial L_P}{\partial m}\leqq 0.$ (long run) $\cdots\cdots(4-9)$

〈Figure 4-1〉



〈Figure 4-2〉



Therefore, we can analyze effects of social welfare in terms of cost-benefit from ⟨Figure 4-1⟩, ⟨Figure 4-2⟩ dependence of social cost n,

(1) $n>2$: $L_P>L_S$. ($V>R$). ⟨Figure 4-1⟩

(2) $2<n<n^*$: $L_S>L_P$. (short run: $X\geqq C$). ⟨Figure 4-2⟩

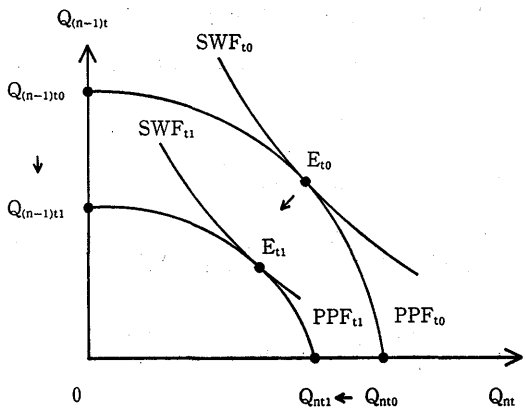
(3) $n<n^*$: $L_S>L_P$. (short run: $X\geqq C$). ⟨Figure 4-2⟩

(4) $n>n^*$: $L_P>L_S$. (long run: $X\leqq C$). ⟨Figure 4-2⟩

(5) E^* : $L_S=L_P$. ⟨Figure 4-2⟩

Now, we can do a well-defined analysis of cost-benefit using a production possibility frontier (PPF) in investment of rent-seeking (Q_{nt}) and other profit-seeking ($Q_{(n-1)t}$) due to cutbacks in government demand, D_g.

⟨Figure 4-3⟩



⟨The welfare effect from dependence on social cost, n ⟨Figure 4-3⟩⟩

$D_{g0}\rightarrow D_{g1}\downarrow$. $\Rightarrow PPF_{t0}\{Q_{(n-1)t0}Q_{nt0}\}\rightarrow PPF_{t1}\{Q_{(n-1)t1}Q_{nt1}\}$.

$\Rightarrow E_{t0}\rightarrow E_{t1}$. $\{Q_{(n-1)t0}\rightarrow Q_{(n-1)t1}\downarrow > Q_{nt0}\rightarrow Q_{nt1}\downarrow\}$.

$\Rightarrow SW_{t0}\rightarrow SW_{t1}\downarrow$. ($SWF_{t0}\rightarrow SWF_{t1}$).

- SW_t : social welfare of time t in change n.
- Q_{nt} : production of rent-seeking firms n of time t in change n.
- $Q_{(n-1)t}$: production of flexibility firms (n−1) of time t in

change n.

- SWF_t : social welfare function of time t in change n.
- E_t : general equilibrium of time t in change n.

We reach the apparently sure conclusion that the directly unproductive game activity game of rent-seeking for lobbying or other production line flexibility is Parto-inferior in social welfare. Therefore, we know the fall of the Pareto-inferior due to investment in other production line under conditions of flexibility greater than that of rent-seeking (firms n). But, if other production line (firms n−1) is able to product private goods, optimal choice from welfare analysis cannot be done in this situation.

(2) Social benefit effect analysis due to change in r

Now, we obtain a welfare benefit analysis for the effect of a coefficient of absolute risk aversion, r, on L_S, L_P, L_F from (4-3), (4-4), (4-5).

1) $$\frac{\partial L_S}{\partial r}=\frac{(m+1)}{r^2}\left[-\ln\left(\frac{me^{rV}+e^{r(V-S)}}{(m+e^{rV})}\right)+\frac{mrTe^{rT}+r(V-S)e^{r(V-S)}}{me^{rT}+e^{r(V-S)}}-\frac{rVe^{rV}}{m+e^{rV}}\right].\ (m\in N,\ r>0)\quad ..(4\text{-}10)$$

If, $V>0$, $V>S$, $\frac{\partial L_S}{\partial r}>0$[4]. $V=0$, $T<S$, $\frac{\partial L_S}{\partial r}<0$[5].

2) $$\frac{\partial L_P}{\partial r}=\frac{m}{r^2}\left[-\ln\left(\frac{me^{r(R+T-V)}+e^{r(R-S)}}{m+e^{rR}}\right)+\frac{m(R+T-V)e^{r(R+T-V)}+(R-S)e^{r(R-S)}}{me^{r(R+T-V)}+e^{r(R-S)}}-\frac{rRe^{rR}}{m+e^{rR}}\right]\quad .....(4\text{-}11)$$

If, $R>0$, $R>V-T$, $\frac{\partial L_P}{\partial r}>0$. $R=0$, $T<V$, $\frac{\partial L_P}{\partial r}<0$.

3) $$\frac{\partial L_M}{\partial r}=\frac{(m+1)}{r^2}\left[-\ln\left(\frac{me^{r(R+T)}+e^{r(V+R-S)}}{m+e^{r(V+R)}}\right)\right.$$

$$+\frac{(R+T)me^{r(R+T)}+(V+R-S)e^{r(V+R-S)}}{me^{r(R+T)}+e^{r(V+R-S)}}-\frac{(V+R)e^{r(V+R)}}{m+e^{r(V+r)}}\Bigg] \quad \text{....(4-12)}$$

If, $R>0$, $V+R>S$, $\frac{\partial L_M}{\partial r}>0$. $R=0$, $\frac{\partial L_M}{\partial r}<0$.

4) $J=L_P-L_S$.

① $(V>R)$, $\frac{\partial L_P}{\partial r}-\frac{\partial L_S}{\partial r}\geqq 0$.

② $(X\geqq C)$, $\frac{\partial L_S}{\partial r}-\frac{\partial L_P}{\partial r}\geqq 0$. (short run)

③ $(X\leqq C)$, $\frac{\partial L_S}{\partial r}-\frac{\partial L_P}{\partial r}\leqq 0$. (long run) ....(4-13)

Therefore, we can know welfare effects from 〈Figure 4〉, 〈Figure 5〉.

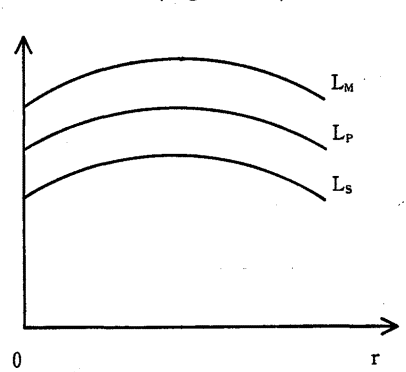
L_S ; monotonic reduces social cost in rent-seeking.

L_P ; monotonic reduces social cost in production flexibility.

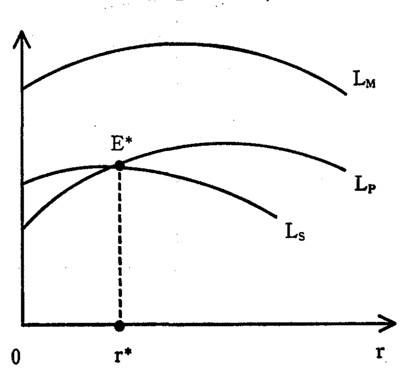
L_M ; monotonic reduces social cost in simultaneous wasteful investment.

Now, we obtain the well-defined conclusion in this synthesis analysis as shown in 〈Figure 4-4〉, 〈Figure 4-5〉.

〈Figure 4-4〉



〈Figure 4-5〉



Therefore, we can analyze effects of social welfare in terms of cost-benefit from 〈Figure 4-4, 4-5〉 dependant on the social cost of r,

(1) $r^* > r : L_S > L_P$. (short run: $X \geqq C$). 〈Figure 4-5〉

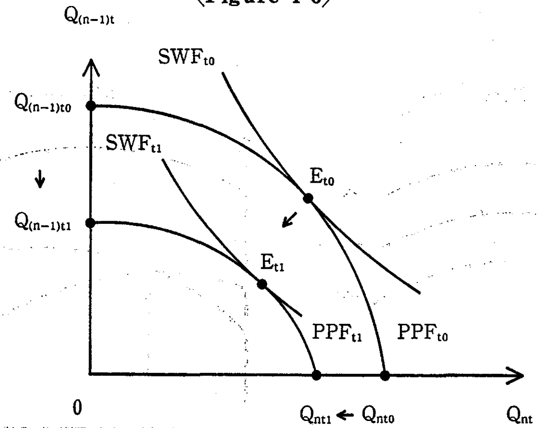
(2) $r^* < r : L_S < L_P$. (long run: $X \leqq C$). 〈Figure 4-5〉

(3) $L_P > L_S$. ($V > R$). 〈Figure 4-4〉

(4) E^*: $L_S = L_P$. 〈Figure 4-5〉

Thus, as is well-known, L_P and L_S can reach equilibrium at E^*. If so, social welfare due to spending resources on wasteful investment is Pareto superior because it incurs less cost, L_S, more than L_P in the long run. Furthermore, we now analyze the measures of social welfare under the production possibility frontier due to total social productivity. Such a method insures the comparing of social cost-benefits analysis. Doing so, we know the increasing social welfare due to rent-seeking of agents, n, is more than another production line under flexibility of firms, (n−1). Now, we can analyze cost-benefits using the probability possibility frontier under investments of rent-seeking (Q_{nt}) and other profit-seeking ($Q_{(n-1)t}$) due to a cutback in government demand, D_g.

〈Figure 4-6〉



〈The welfare effect from dependence of social costs on r: 〈Figure

4-6》

$D_{g0} \rightarrow D_{g1}\downarrow. \Rightarrow PPF_{t0}\{Q_{(n-1)t0}Q_{nt0}\} \rightarrow PPF_{t1}\{Q_{(n-1)t1}Q_{nt1}\}.$

$\Rightarrow E_{t0} \rightarrow E_{t1}.\ \{Q_{(n-1)t0} \rightarrow Q_{(n-1)t1}\downarrow > Q_{nt0} \rightarrow Q_{nt1}\downarrow\}.$

$\Rightarrow SW_{t0} \rightarrow SW_{t1}\downarrow.\ (SWF_{t0} \rightarrow SWF_{t1}).$

- SW_t : social welfare of time t in change r.
- Q_{nt} : production of rent-seeking firms n of time t in change r.
- $Q_{(n-1)t}$: production of flexibility firms (n−1) of time t in change r.
- SWF_t : social welfare function of time t in change r.
- E_o : general equilibrium of time t in change r.

Furthermore, we obtain the well-defined analyses that the total social production will decrease from PPF_{t0} to PPF_{t1}. The social welfare due to rent-seeking and other profit-seeking is now only fail to increase the sum at the new production possibility frontier PPF_{t1}. Therefore, we obtain a welfare loss under cost-benefits because an increase in addition to the wasteful investments expenditure on spending resources is in order to protect profits of the identical agents. Thus, social welfare decreases from profit protection are overstated.

5. Conclusion

This paper provides analysis of a third alternative method of defensive action when facing the potential loss of profits by an agent. In short, rent-seeking may be Pareto-superior since it is less socially wasteful than other profit-seeking. It is worth nothing that the perspectives of investment have their own distribution share in unproduction. It is not altogether clear how individual (agents) can be expected to invest time on the effects under uncertainty of the future. Specially, we showed where the properties of a pure public good, local public good and its related subindustries have various problems. But agents can overcome the difficulties associated with status quo at the national constitutional economy level. Thus, we argue that the constitutional economy offers an appropriate perspective on conditions of future uncertainty in that it enables us to examine rent-seeking or other profit-seeking activities both separately and under simultaneous wasteful investment. We have been able to overcome the absolute risk aversion of all agents, which is raised by the social cost-benefits perspectives under rent-seeking, other profit-seeking (production flexibility), and simultaneous wasteful investment in this industry.

We display the path of the Cournot-Nash adjustment in the tâtonnement process under some investment of the social waste (loss) sector. Thus, the tâtonnement process converged to the Cournot-Nash equilibrium from every starting point in investments of the all agents. But, that point in the Cournot-Nash equilibrium yields social welfare loss because of a wasted investment of the agents. Thus, this equilibrium under waste investment of the agents is the point of Pareto-inferior under the Paretian criteria in social welfare sectors because it has the structures of a zero-sum or negative-sum game.

Notes

1. Rent-seeking is the expenditure of scarce resources to capture an artificially created transfer.
2. Agents had a combination of unproductive profit-seeking activities.
3. In this paper, outputs refer to is public goods or local goods.
4. If is small, we must show that the two term is will be positive and dominated by all the terms. Thus, $\partial L_s/\partial r>0$.
5. If is for large enough, we must show that one, the third term is will be dominated by the exponential (e^r) terms, then, $\partial L_s/\partial r<0$.

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