

Title	BOTTOM UP AND "TOP DOWN" PROCESSES TO PROTECTION
Sub Title	
Author	UTADA KAI, Ayako
Publisher	Keio Economic Society, Keio University
Publication year	2001
Jtitle	Keio economic studies Vol.38, No.2 (2001.) ,p.53- 63
JaLC DOI	
Abstract	
Notes	
Genre	Journal Article
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=AA00260492-20010002-0053

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“BOTTOM UP” AND “TOP DOWN” PROCESSES TO PROTECTION

Ayako UTADA KAI

Graduate School of Economics, Keio University, Tokyo, Japan

First version received January 2001; final version accepted July 2001

1. INTRODUCTION

There are two lines of researches on political economy of trade policy making. One focuses on how lobbying groups let the incumbent government form a policy. The other concentrates on how the incumbent government, by setting up a policymaking rule, prompts lobbies to participate in the policymaking process. These two lines of researches differ in who leads the policymaking, whether lobbies or the incumbent government. Here we call the former type of policymaking process “Bottom Up” and the latter “Top Down” by setting the incumbent government, an intrinsic executor of the policy, on top.

The objective of this paper is to compare effects of “Bottom Up” and “Top Down” processes to the policy outcome in a simple trade policymaking model. Although there are many existing literature on political economy of trade policymaking, they all implicitly or explicitly assume either one of the processes, “Bottom Up” or “Top Down,” and focus on their explanation of trade protection. It has therefore not been argued how policymaking process affects the outcome. In this paper, we categorize the processes assumed in the existing literature into two types, “Bottom Up” and “Top Down,” and place both processes in a same trade policymaking model to compare effects of those processes to the policy outcome.

“Bottom Up” policymaking process is assumed as in Hillman (1982) and Grossman and Helpman (1994). In Hillman (1982), the incumbent government decides the tariff level of a traded goods so as to maximize its objective function, a weighted sum of the aggregate welfare and the profit obtained by producing the goods domestically. The profit comes into government’s objectives because it is assumed in the paper that the government enjoys political support from those who share the profit by raising the tariff level. Grossman and Helpman (1994) endogenized lobbies’ support of the government in the analysis by assuming that the people form lobbying groups and contribute to influence the government’s decision on the tariff. Here each lobby decides amount of contribution corresponding to each level of the tariff so as to maximize its net welfare. The government receives their offers and decides the level of tariff in order to maximize

Acknowledgement. I am very grateful to Professors Michihiro Ohyama, Makoto Yano, Masatoshi Tsumagari, and Yoshimasa Shirai for helpful advice. I sincerely thank the anonymous referee for descriptive and thoughtful advice. All errors are mine. Email ayako.kai@mbi.nifty.com

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its objective function, a weighted sum of the aggregate welfare and the total amount of contributions. These papers focus on the policymaking process in which lobbies lead the incumbent government, “Bottom Up” policymaking process.

“Top Down” policymaking process, on the other hand, can be found in Findlay and Wellisz (1982). Here a tariff formation rule is set by the incumbent government. The rule asserts that the government give consideration to policy demands of its people in the decision making of the tariff level. Lobbying groups know the rule by experience and make their demands accordingly. Present study models “Bottom Up” and “Top Down” processes in a very simple policymaking structure of one lobby versus the government where they intervene to decide a level of tariff. We then compare their effects to the policy outcome.

The result shows that both processes, “Bottom Up” and “Top Down,” end with a same level of tariff. Only the share of welfare between the lobby and the government may differ. This result should not only explain ways in which trade protection is implemented but also serve as a benchmark for further studies on political economy of policy making. When you consider such an idealized political economy as the one modeled in this paper, process of policy making does not affect the outcome. Whether the reality treats this argument affirmative or negative, one can always go back to the implicit assumptions of this argument and suggest characteristics of the real political economic settings. We hope to explain different structures of trade protection and to provide a concrete footing for further studies on political economy of policy making.

The paper continues as follows. In the next section, a small country economy is drawn. Section III explains its political structure. Section IV characterizes the two political processes, “Bottom Up” and “Top Down.” The effects of the processes to the policy outcome are analyzed. Section V closes this paper by mentioning limits and possible extensions of this paper.

2. ECONOMIC STRUCTURE

Here we consider a small open economy with its population equals to 1. For simplicity, let each individual maximize a utility function with the following form.

$$U = c_z + u(c_x) \quad (1)$$

The function u is differentiable, increasing, and strictly concave. c_z is the consumption of goods z , the numeraire goods with its world and domestic price equal to one. c_x is the consumption of goods x , an import competing goods. As we denote its domestic price, p_x , each consumer must satisfy the following constraint.

$$E \geq p_x c_x + c_z \quad (2)$$

E represents his total spending. Each consumer demands $d(p_x)$ of goods x , the inverse function of $u'(c_x)$. Consumer surplus thus becomes $s(p_x) = u(d(p_x)) - p_x d(p_x)$. The consumption of goods z can be expressed as $c_z = E - p_x d(p_x)$.

The numeraire goods z is produced from labor alone with constant returns to scale. Assuming that there is enough labor supply to ensure positive production of the goods, let the wage rate be w . The import competing goods x is manufactured from labor and

a sector-specific factor with constant returns to scale. Let cost function of producing x amount of goods x be $H(x)$, which is differentiable, increasing, and strictly convex. The supply of goods x is determined to maximize the profit $\pi(x) = p_x x - H(x)$ that gives total reward to the sector-specific factor. Thus the supply of goods x , $x(p_x)$, is the inverse function of $H'(x)$. Let p_x^* denote the world price of goods x . The specific import tax on goods x induces a wedge between the domestic price p_x and the world price $p_x^* : t = p_x - p_x^*$. The demand, the supply, and the profit of x can thus be rewritten as $D(t)$, $X(t)$, and $\Pi(t)$.

When the government distributes tax revenue or collect rents in lump sum fashion, national income is represented as follows.

$$Y(t) = w + tM(t) + \Pi(t) \quad (3)$$

$M(t) = D(t) - X(t)$ denotes the amount of import of goods x . Terms on the right hand side are wage revenue, tax revenue, and the production profit of goods x respectively. The social welfare can be written as follows.

$$W(t) = Y(t) + S(t), \quad (4)$$

where $S(t)$ is the consumer surplus of goods $x : S(t) = u(D(t)) - (p_x^* + t)D(t)$. Assuming that the import elasticity decreases as the level of tariff increases: $W'' < 0$, free trade maximizes the social welfare.

3. POLITICAL STRUCTURE

This section sets the political structure of the small country economy. The sector-specific factor owners receive tax and wage revenues individually and share the production profit of goods x , $\Pi(t)$. Let α ($0 < \alpha < 1$) denote the fraction of sector-specific factor owners to the people. Aggregate welfare of the owners will be as follows.

$$W_1(t) = \alpha(w + tM(t) + S(t)) + \Pi(t) \quad (5)$$

Here, we assume that $W_1'' = \alpha(M' + tM'') + (1 - \alpha)X' < 0$. This implies that there is a sufficient number of sector-specific owners for the first term on the right hand side is negative and the second is positive. Owners may form a lobbying group and jointly contribute to the government asking for more favorable level of tariff. The lobby determines the contribution, c , in order to maximize its net welfare:

$$V(t, c) = W_1(t) - c. \quad (6)$$

The government favors the contribution c while it cares about the social welfare. Thus the government determines the trade policy, t , to maximize the following objective function:

$$G(t, c) = kW(t) + c, \quad (7)$$

where k is the positive weight the government puts on the social welfare relative to contribution. Thus whether the lobby decides not to contribute or the government decides not to let the lobby participate, free trade turns out to be the equilibrium policy.

4. “BOTTOM UP” VS. “TOP DOWN” PROCESSES

This section explains two trade policymaking processes, “Bottom Up” and “Top Down,” placing the government, the intrinsic executor of the policy, on top. The lobby leads in “Bottom Up” process while the incumbent government moves first in “Top Down” process. Here the effects of these processes to the policy are analyzed.

4.1 “Bottom Up” policymaking process

This type of policymaking process has been analyzed in several works as in Grossman and Helpman (1994). In this “Bottom Up” policymaking process, the lobby starts the trade policy making by submitting a contribution schedule $c(\cdot)$, which appends the amount of contribution ready to be paid for every possible level of tariff. It does so in order to maximize its net welfare. Responding to this offer, the government determines the level of tariff so as to maximize its objective function.

Thus in the first stage of “Bottom Up” process, the lobby faces the following maximization problem.

$$\max_{c(\cdot)} V(t^*(c(\cdot)), c^*(c(\cdot))) = W_1(t^*(c(\cdot))) - c^*(c(\cdot)),$$

where

$$t^*(c(\cdot)) = \arg \max_{t \in \Omega_t} G(t, c(t))$$

and

$$c^*(c(\cdot)) = c(t^*(c(\cdot))). \quad (8)$$

Ω_t is the set of tariff levels from which the government may choose. We assume here that the government may well choose free trade, i.e., $0 \in \Omega_t$. We also assume that the government accepts no negative contribution, i.e., $c(t) \geq 0$ for all $t \in \Omega_t$. Then the following must hold.

LEMMA 1. *The following condition concerning the value of the government’s objective function must hold under the assumption of non-negative contribution.*

$$kW(t^*(c(\cdot))) + c^*(c(\cdot)) \geq kW(0). \quad (9)$$

Proof. Suppose (9) does not hold.

$$kW(0) > kW(t^*(c(\cdot))) + c^*(c(\cdot))$$

Since the right hand side is the maximum of the government’s objective function given a contribution schedule, the equation above can be rewritten as below.

$$kW(0) > kW(t) + c(t), \quad \text{for all } t \in \Omega_t.$$

Furthermore, since $0 \in \Omega_t$, the following must hold as well.

$$kW(0) > kW(0) + c(0).$$

But this can not be true under the non-negative contribution assumption. Therefore (9) must hold. Q.E.D.

Lemma 1 states that the value of the government’s objective function derived through “Bottom Up” process must be greater or equal to the one the government can obtain

from not participating the policymaking process. Lemma 1 could therefore be called the participating condition for the government to participate in this "Bottom Up" process. The lobby must assure at least as much welfare as of non-participation to the government. Otherwise, the government would be better off by ignoring the contribution schedule and deciding the tariff level on its own. At the first stage of the process, it is thus natural to think that the lobby decides its contribution schedule under condition (9).

Let $(t^B, c^B(\cdot))$ be the equilibrium pair of the tariff and the contribution schedule derived through "Bottom Up" process explained above. Then t^B satisfies the following.

PROPOSITION 1 (Grossman and Helpman (1994)). *The equilibrium tariff level determined through "Bottom Up" process t^B maximizes the joint welfare of the government and the participating lobby:*

$$t^B = \arg \max_{t \in \Omega_t} \{kW(t) + W_1(t)\}. \quad (10)$$

Proof. Substituting condition (9), the maximand of (8) can be expressed as below.

$$\begin{aligned} & W_1(t^*(c(\cdot))) - c^*(c(\cdot)) \\ & \leq kW(t^*(c(\cdot))) + W_1(t^*(c(\cdot))) - kW(0) \end{aligned}$$

Under condition (9), the lobby's net welfare can be no greater than $kW(t^*(c(\cdot))) + W_1(t^*(c(\cdot))) - kW(0)$. This is no greater than the maximum, $kW(t^{**}) + W_1(t^{**}) - kW(0)$, where $t^{**} \equiv \arg \max_{t \in \Omega_t} \{kW(t) + W_1(t)\}$. The lobby then decides its contribution schedule so as to yield t^{**} through "Bottom Up" process and attain the maximum. It does so by offering, for example, $c^B \equiv k[W(0) - W(t^{**})]$, which is non-negative since free trade maximizes the social welfare, for $t = t^{**}$, and $c = 0$ for all $t \neq t^{**}$. Under the contribution schedule given as such, the government will choose $t = t^{**}$ and the lobby in turn obtains the maximum.¹ So long as the lobby tries to maximize its net welfare given condition (9), t^{**} will be the equilibrium level of tariff since free trade maximizes the social welfare. Then, from the definition of t^{**} , the joint welfare of the government and the lobby is maximized. Q.E.D.

This "Bottom Up" process can be illustrated as in Figure 1. The lobby must assure that the government receives its offer and acts on its schedule. Thus indifference curve of the government must lie below G_0 with the value of $G(0, 0)$ that passes through the origin. Otherwise, the government will do better by just deciding the policy on its own. The lobby maximizes its net welfare under this condition. Thus the lobby decides the contribution schedule $c(\cdot)$ so that it passes through the point where its own isoprofit curve lies tangent to G_0 , which is drawn as V_B with the value of $V(t^B, c^B)$. Since the upper-contour sets at $G(0, 0)$ and at $V(t^B, c^B)$ are both convex, the equilibrium is uniquely determined as E^B .

4.2 "Top Down" policymaking process

In the "Top Down" process, the government moves first by announcing the tariff formation rule $t(\cdot)$. This rule states that the government decides the level of tariff in

¹ We assume here that if it is indifferent for the government to participate and not to participate, then the government will choose to participate. Same assumption can be applied to the lobby in "Top Down" process.

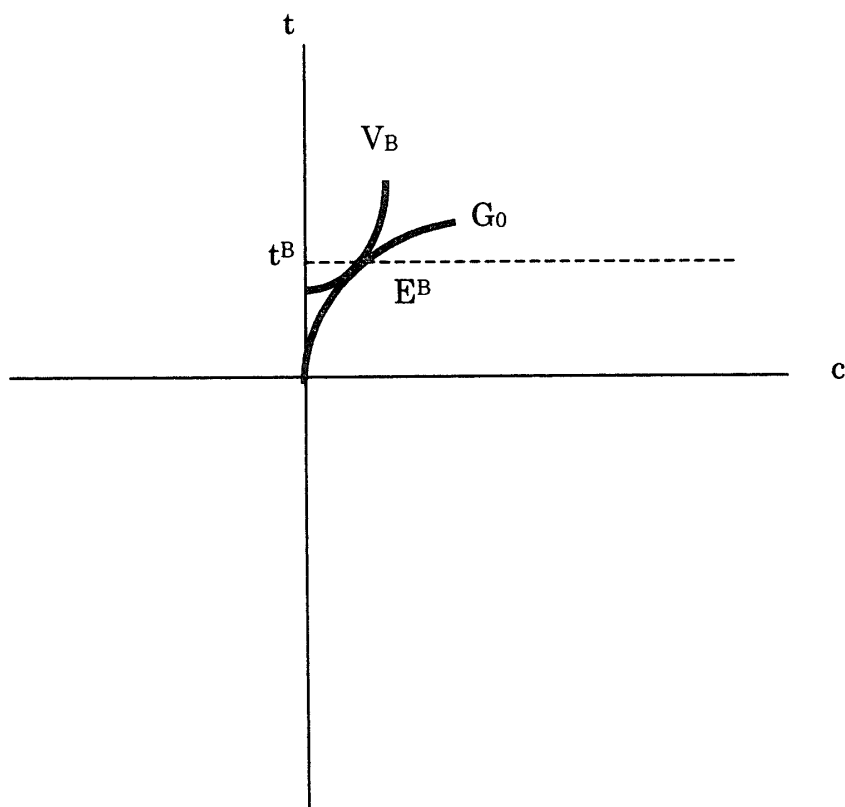


Figure 1.

relation with the amount of contribution. Taking this policymaking rule as given, the lobby decides the amount so as to maximize its net welfare.

Thus in the first stage of “Top Down” process, the government solves the following maximization problem.

$$\max_{t(\cdot)} G(t^*(t(\cdot)), c^*(t(\cdot))) = kW(t^*(t(\cdot))) + c^*(t(\cdot)),$$

where

$$c^*(t(\cdot)) = \arg \max_{c \in \Omega_c} V(t(c), c)$$

and

$$t^*(t(\cdot)) = t(c^*(t(\cdot))). \quad (11)$$

Ω_c represents the set of contribution amount from which the lobby may choose. We allow here to consider the possibility of no contribution from the lobby, i.e., $0 \in \Omega_c$. With no contribution, we further assume that the government will always set the tariff level to zero, i.e., $t(0) = 0$. This implies that the government always acts true to its objective function and has no incentive to bluff the lobby into contributing. Here similar but just the opposite explanation to “Bottom Up” process can be applied.

LEMMA 2. *The following condition concerning the value of the lobby’s net welfare must hold under the assumption of free trade with no contribution.*

$$W_1(t^*(t(\cdot))) - c^*(t(\cdot)) \geq W_1(0) \quad (12)$$

Proof. Suppose (12) does not hold.

$$W_1(0) > W_1(t^*(t(\cdot))) - c^*(t(\cdot))$$

Since the right hand side is the maximum of the lobby's net welfare given a tariff formation rule $t(\cdot)$, it can be restated as below.

$$W_1(0) > W_1(t(c)) - c, \quad \text{for all } c \in \Omega_c.$$

Furthermore, since $0 \in \Omega_c$, the following must hold as well.

$$W_1(0) > W_1(t(0)) - 0.$$

But this can not be satisfied since given its objective function (7), the government will decide the tariff level to zero when the lobby offers no contribution, i.e. $t(0) = 0$. Therefore (12) must hold. Q.E.D.

Lemma 2 states that the value of the lobby's net welfare derived through "Top Down" process must be greater or equal to the one the lobby can obtain from not participating the policymaking. Lemma 2 could therefore be called the participating condition for the lobby to participate in this "Top Down" process. The government must assure at least as much welfare as of non-participation to the lobby. Otherwise, the lobby would just ignore the policymaking rule, paying no positive contribution to the government, and "Top Down" process would be of no use. It is therefore quite natural to think that the government maximizes its objective function under condition (12) in the first stage of this game.

Let $(t^T(\cdot), c^T)$ be the equilibrium pair of the tariff formation rule and the amount of contribution derived through "Top Down" process. Then the equilibrium level of tariff, say t^T , satisfies the following.

PROPOSITION 2. *The equilibrium tariff level determined through "Top Down" process t^T maximizes the joint welfare of the government and the participating lobby:*

$$t^T = \arg \max_{t \in \Omega_t} \{kW(t) + W_1(t)\}. \quad (13)$$

Proof. Using the restriction (12), the maximand of (11) can be expressed as below.

$$\begin{aligned} & kW(t^*(t(\cdot))) + c^*(t(\cdot)) \\ & \leq kW(t^*(t(\cdot))) + W_1(t^*(t(\cdot))) - W_1(0) \end{aligned}$$

Under condition (12), the value of the government's objective function can be no greater than the maximum, $kW(t^{**}) + W_1(t^{**}) - W_1(0)$, where $t^{**} \equiv \arg \max_{t \in \Omega_t} \{kW(t) + W_1(t)\}$. The government then decides the tariff formation rule so as to yield t^{**} through "Top Down" process and attain the maximum. It does so by announcing, for example, $t = t^{**}$ for $c^T \equiv W_1(t^{**}) - W_1(0)$ and $t = 0$ for all $c \neq c^T$. From Lemma 2 and the non-negative contribution assumption applied to $c^*(t(\cdot))$, c^T is non-negative. Given the policymaking rule, the lobby is persuaded to contribute c^T for it maximizes the lobby's net welfare under the assumption of non-negative contribution assumption. The government in turn choose t^{**} as the equilibrium level, through which it can obtain the maximum. Therefore (13) must hold. Q.E.D.

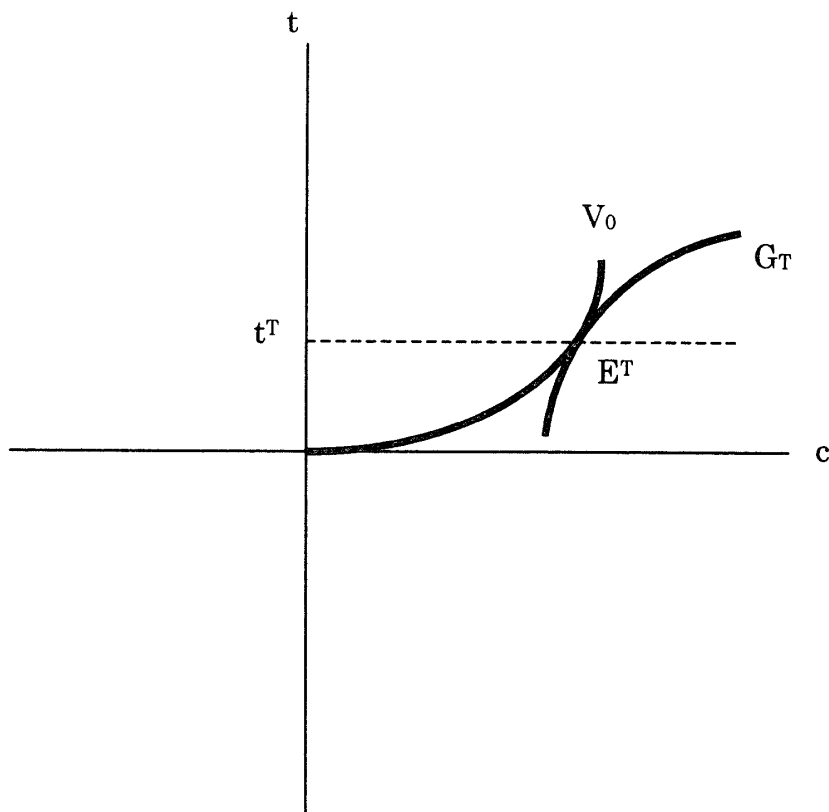


Figure 2.

This “Top Down” process can be illustrated as in Figure 2: the lobby’s isoprofit curve must lie above V_0 with the value of $V(0, 0)$ that passes through the origin. The government then maximizes its objective function by determining the tariff formation rule $t(\cdot)$ that includes the equilibrium point E^T where its own indifferent curve lies tangent to V_0 , which is drawn as G_T with the value of $G(t^T, c^T)$.

As shown in Propositions above, both “Bottom Up” and “Top Down” processes end with the same level of tariff as shown in Figure 3. Notice in the figure that two tangent lines at t^B and at t^T are parallel, that is, at the equilibrium, a unit level of tariff is measured by the same amount of contribution either in the lobby’s contribution schedule of “Bottom Up” process or in the government’s tariff formation rule of “Top Down.”

We are now ready to sum up all the results derived above.

PROPOSITION 3. *An identical policy outcome is derived through “Bottom Up” and “Top Down” policymaking processes.*

$$t^B = t^T = \arg \max_{t \in \Omega_t} \{kW(t) + W_1(t)\} \quad (14)$$

First equality of Proposition 3 asserts that process of policy making does not affect the outcome. Only the benefit share between the participants may differ. Through “Bottom Up” process, the lobby schedules its offer to acquire all the share leaving just enough to make the government accept its offer. The lobby then pays just enough to compensate the social cost of protection in terms of contribution, $c^B \equiv k[W(0) - W(t^{**})]$, and

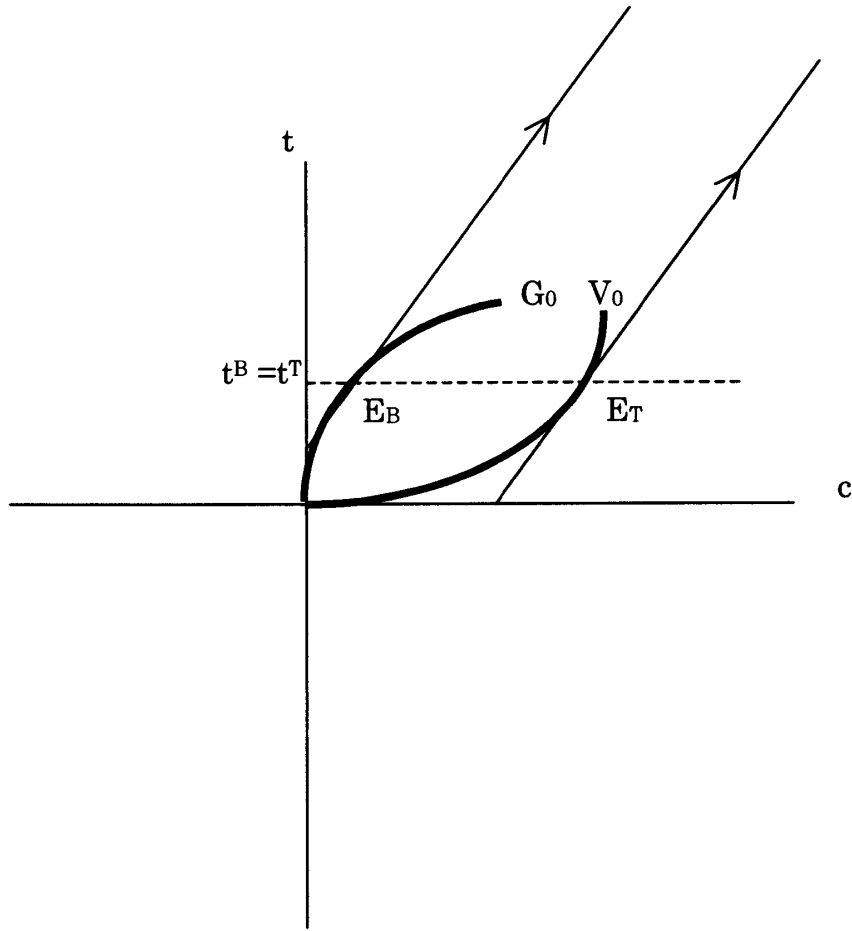


Figure 3.

obtains net welfare of $W_1(t^{**}) - k[W(0) - W(t^{**})]$. The government is left with non-participating value of its objective function, $kW(0)$. Through "Top Down" process, on the other hand, the government determines the policymaking rule so as to derive all the share but the non-participating welfare of the lobby. Thus the government takes all the lobby's aggregate benefit of protection, $c^T \equiv W_1(t^{**}) - W_1(0)$, and obtains $kW(t^{**}) + W_1(t^{**}) - W_1(0)$ whereas the lobby's net welfare remains at the non-participating level, $W_1(0)$.

Notice now that the government's subjective value of social welfare relative to contribution, k , has to satisfy the following for both "Bottom Up" and "Top Down" processes to be established.

$$k \leq \frac{W_1(t^{**}) - W_1(0)}{W(0) - W(t^{**})} \tag{15}$$

Otherwise, the first mover of each process would be better off by retreating from the process. Multiplying both sides by $W(0) - W(t^{**})$, it is easy to see that equation (15) satisfies when the lobby's aggregate benefit of protection is at least as much as the social cost of protection in terms of contribution. From the definition of c^B and c^T , equation (15) also imply that $c^B \leq c^T$. Only when the equality holds in equation (15), does

the benefit share between the participants be the same for both “Bottom Up” and “Top Down” processes. So long as the private benefit exceeds the social cost in terms of contribution, the lobby is better off through “Bottom Up” process than through “Top Down” process while the opposite argument can be applied to the government.

You might already have recognized that the basis of this result resembles the world of celebrated Coase theorem. Coase theorem has an important implication since it provides how and when economic efficiency is brought about among economic agents with externality. As is well known, it has provoked, under the real economic relationships, to study the reasons for failure of the theorem, termed “transaction costs.”

Here, however, we did not go into the transaction-cost economy but rather stayed in the idealized world of Coase theorem. Second equality of Proposition 3 can thus be interpreted as of Coase theorem in the political economy framework: the policy outcome (an externality, e.g., pollution) is independent of the policymaking process (institutional factors, e.g., an assignment of liability for damage) and has the property of Pareto efficiency among participants of the policymaking.

Let me remind you here that this Pareto efficiency does not imply maximization of the social welfare, which can only be attained through free trade. Rather, the joint welfare of the government and the lobby is maximized. This provides a positive analysis of trade protection. So long as there exists other participants besides the government in the policymaking, trade protection may arise as a Pareto efficient outcome.

The above argument holds if the policymaking market was already built where the incumbent government has an intrinsic right and the lobby has enough entities to participate in the policymaking respectively, and if they could costlessly form and announce a policymaking rule or a contribution schedule to the other player, let alone decide a tariff level or an amount of contribution as a follower. These are so called “transaction costs.”

Although the result is derived from an idealized political economy as of Coase theorem, it may provide a footing for further studies on policymaking. In the real world, policymaking process may well affect the outcome. One can then extend the argument of this paper to illustrate the wedge between the result and empirical evidences. If it does not, one can always go back to the implicit assumptions of this argument and suggest characteristics of the real political economic settings. In either way, the argument might have provided a benchmark for further studies on the effects of policymaking processes to their outcome.

5. CONCLUSION

In this paper we compared the two types of trade policy making, “Bottom Up” and “Top Down”, with respect to the level of tariff and found that either process yields the same policy outcome. Notice that the result holds when there is no transaction costs in the policymaking environment. What might be the transaction costs to upset this assertion? Characterization and studies of these costs may be promising candidates for future research.

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