Is it such an easy thing to influence a government? *

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Abstract

The formation of protection policies is usually seen as a process in which firms are directly involved. One may expect that firms in danger are those that pay much to the government. However, considering that to pay the government, a firm needs to have profit, this expectation could be untrue. Therefore, the question of how the firms influence a government is crucial. The competition between firms that try to influence the government could be totally transformed. This implies two considerations. First, the shape of the objective function of the government and second, the method used by firms to influence the government. In this paper, a model is proposed to investigate a new form of contribution schedule. This paper shows that whatever the competition form, by quantity or by price, the firms are still designing a truthful contribution schedule in spite of the modification of their method to influence the government. The main results are that firms that pay more are those that benefit from a better position and not those in danger. In fact, the latter are helped because of a social consideration from the government, not because of their influence.

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1 Introduction

When the interests of a sector are linked to a commercial decision, some firms may try to influence the decision maker. Whether this interest is direct or indirect, a firm may at least try to influence or, possibly, she may succeed in influencing the decision related to this interest in order to obtain the most favorable and sustainable issue. As the important literature on the subject can attest, the protection policy is a field that particularly applies to this scheme. The government sets tariffs, subsidies or non-tariffs barriers, all influencing directly firms’ environment. The ongoing debate about Chinese exports of textile largely support this fact. The governments of the USA and the EU are directly involved in these negotiations. The case of the EU is particularly interesting. The governments have negotiated exportations quotas on Chinese textile in last June and, two months later, came back to the Table to renegotiate. Arguing that the retail sector companies are unsatisfied with this solution because of their stocks of Chinese products blocked at customs. Indeed, these stocks may represent a non-negligible loss for these firms if they are not sold fast enough, particularly in the textile sector where demand is very fluctuating. This situation illustrates the complexity of the decision process since the governments have to cope with totally diverging interests. On the one side, there is a sector that suffers from the east-Asian competition and on the other side, there is a healthy and powerful sector.

These considerations lead directly to our intuitions. That is the possible confusion between influence of firms and the protection of firms in danger. This example shows that it is hard to conciliate both interests since the instrument used to protect a sector also harms another sector. Consequently, a commercial decision can be due to the influence of firms or to the protection of a sector.
Generally, governments have a concern for national firms’ interests. Yet, firms still have an incentive to influence their government. The weight a government grants to national producers interest is really important in this relation. However, there also is the manner it considers national firms. Whether the government has concerns about the governance of a firm or not, whether it is really maximizing a social welfare or not, both alternatives could have a very different impact on firms and consumers. Moreover, the firm may not all benefit from the same treatment. The recent articles that showed the predictability of the presidential elections in the USA result thanks to the observation of the prices of shares of some particular sectors, suggest that these firms would benefit of a different treatment according to the elected President.

Why is this true? Surely because both candidate do not have connections with the same sectors, but also because firms have paid some generous contributions to the electoral campaign. This means that firms have to make their offer before the government sets its policy. The cost of influencing the government a firm is able to support has to be related to the profit it gets without the optimal policy.

This paper studies the consequences of a slightly different form of social welfare and a different form of welfare maximization, on the relation between firms and governments. This paper also investigates the question of the formation of the contribution schedule. That is, the shape that would be the most relevant in the particular case of firm. All this allowing us to answer the question of the opportunity to influence the government.

Since the seminal article of Bernheim and Whinston (1986) in which they stated the principle of a truthful equilibrium, and the developments of Grossman and Helpman (1994, 1995a,b) in which they generalized the prin-
ciple of truthful equilibrium to the relation between special interest groups (SIG) and a government with a continuum of feasible policies, this way to consider relations SIG-government has been used by many economists to explore the impact of these relations on many aspects of politics and economics. Each SIG makes a continuum of proposals to the government. The latter receives the set of proposals and decides what policy to implement. The proposals are an infinite set of contributions related to a particular policy vector. When the government finally chooses a policy vector, it receives all the contributions that corresponds to this policy vector. The truthfulness of the equilibrium guaranties that each actor of the game obtains the best possible policy, given the interests of all other actors. However, some more recent papers have proposed other ways to consider these relations. Kirchsteiger and Prat (2001) have made a particularly interesting proposition. They developed the concept of natural equilibrium. This type of equilibrium is compared with the truthful equilibrium. A natural equilibrium corresponds to a strategy where the firm makes only one offer. This offer corresponds to the policy that is preferred by the firm. In this paper, they run some experiments and find that the natural equilibrium is much more used than truthful one. As a particular SIG, a firm can represent several thousand of people, but it is not sure that all employees have a preference for protection. In the Grossman and Helpman (1994) framework, the truthfulness of the equilibrium implies that interests are different for each SIG. Each one has an interest related to its specific factor and it also has an interest related to the fact that its members are consumers and a fortiori voters. We developed here another proposition to shape a contribution schedule which therefore leads to a different comportment of the government and of the firms. This is a kind of conciliation between truthful and natural equi-
libria. That is, firms made a unique proposition which corresponds to the "truthful path" of their wishes.

This allows to not consider a truthful contribution context when the government maximize its welfare, allowing therefore to think this maximization as social even if the government perceives some contributions. However, it appears that this methodology may coincide with the truthful equilibrium framework under particular conditions. The consequence of this reshaped contribution schedule is that the influence a firm can have on a government may be reduced or increased compared to truthful equilibrium. Another result is that when an homogenous good is produce by all firms, this is the more productive firms that will pay the highest contribution.

The remaining of the paper is organized as follows. Section 2 develops the general framework. Section 3 and section 4 exposes the functioning of the policy choices and develops the formation of the contribution schedule in the case of differentiated good, respectively. Section 5 presents the special case of the homogenous good. The last section concludes.

2 General framework

As stated in the introduction, the firm is particular in our approach. It is not interested in the consumer surplus. In the Grossman and Helpman (1994) approach, each special interest group has a concern in the producer surplus associated to the specific factor it represents and in the sum of the consumer surplus of all its members. We consider in this paper that a firm has only a concern in its profit. This distinction allows us to distinguish between a SIG as an agricultural cooperative and a firm. The former is a set of farmers that generally has a relatively small production. Therefore, the comparison
between its profit and its situation as a consumer is relevant since they represent amounts of an equivalent magnitude. The capital of firm is generally much more important than the capital of the owner or of the manager. We may add that owners and managers of the firm can access to other markets.

We consider a general utility function of consumers denoted $U$. The inverse of $U'(Q) = p(Q)$ is demand function $Q$ and $p(Q)$ is the local price. The profit function is $\pi_i$. We consider that there are $N$ firms on the market. The demand function is $Q = \sum_{i=1}^{N} q_i + M$. $M$ represents the consumption of importations of the same good. The government has a linear objective function given by

$$G = W + \alpha \sum_{i=1}^{N} C_i(\tau)$$

where $W$ represents aggregate, gross-of-contribution welfare. We consider $W$ as the social welfare. $C_i$ represents the contribution of firms $i$. It depends on $\tau$, that is the policy set by the government. It is then a situation similar to the Grossman and Helpman framework. The firm pays a contribution in order to obtain the most favorable tariff. The parameter $\alpha$ represents the relative weights of the contribution in the welfare, this has to be compared to the coefficient $a$ in Grossman and Helpman (1994). This could be interpreted as a coefficient that reflects the efficiency of the lobbies or the interest of the government to generate private revenues.

We are interested in the difference between a situation where the $N$ firms produces a same homogenous good and the situation where each firm produces a particular good. The utility function is then a function of the utility derived from the consumption of each good plus a numeraire good, namely
good 0

\[ U = x_0 + \sum_{i=1}^{N} u_i(q_i) \]  \hspace{1cm} (2)

The sub-utility functions are differentiable, increasing and strictly concave. If the good is homogenous, then it becomes a very simple expression. The total consumers has a demand of good \( i \) that is equal to \( q_i = d(p_i) \) where \( p_i \) is the local price of good \( i \).

The social welfare is given by

\[ W = (U - \sum_{i=1}^{N} p_i d(p_i)) + \lambda \sum_{i=1}^{N} \Pi_i + \sum_{i=1}^{N} \tau_i (d(p_i) - q_i) \]  \hspace{1cm} (3)

where parameter \( \lambda \) represents how the government weighs the producer surplus. This can be interpreted as the political tendency of the government. The more the government is liberal, the more it weighs the producer surplus.

The contribution is defined as the primitive of the contribution schedule. Thus, it represents the fact that the proposition of the firm is done before the government set its policy. The corollary of this definition is that the contribution schedule is the partial of the contribution. Therefore, the contribution schedule is somehow the rule that allows the government to calculate the amount of contribution it will receive by setting a policy \( \tau \). This contribution schedule is denoted \( c_\tau \). \( c_\tau \) is a function of \( \tau \). By definition, \( C_i \) is also a function of \( \tau \). To sum up we have the following definition

\[ C'_i(\tau_i) \equiv c'_\tau(\tau_i) \]  \hspace{1cm} (4)
We focus on the two first stages of the game, then it is not necessary to define \( \tau_i \). We will just say that it is supposed to represent a direct or an indirect policy choice. The government, to set the optimal policy, will maximize its welfare function regarding to the policy choice that are available. The optimal policy \( \tau^* \) is such that

\[
\nabla W(\tau^*) + \alpha \sum_{i=1}^{N} \nabla C_i(\tau^*) = 0
\]

The very important point of this paper is that we consider that firms do not choose their payment regarding to the welfare function of the government. Indeed, firms will choose their contribution schedule by maximizing their profit. After the government stage is solved and the optimal tariff is found, firms know how the government set its policy and how this optimal policy is affected by the form of the contribution schedule. Therefore, firms will consider their profit, they also will consider the marginal effect of change of their contribution schedule on their profit.

From the government stage it is possible to express the optimal tariff of the government as a function of the contribution schedule. Therefore, the firm can use this function in order to maximize their profit over the contribution schedule. This yields the contribution schedule that allows them to obtain the most favorable policy. The firm is not trying to determine what would be the optimal policy first in order to influence the government to set this policy. Since the contribution schedule is a strategic tool available to firms, they will use it to be sure to maximize their profit. In the Grossman and Helpman framework, there is a kind of simultaneity since the optimal policy that define in their proposition 2 is already compatible with the maximization of the welfare of the special interest group. In our framework, we
do not consider that profit is maximized by the government. The profit is
in the social welfare and the government maximize the whole social wel-
fare with a particular care about the profit represented by $\lambda$. This allows to
consider that a government has not the will to satisfy all lobbies, it only will
estimate the different contributions to set its policy vector.

Thus, the optimal tariff is

$$\tau_i^* = f\left(\sum_{i=1}^{N} c_i^\prime\right) \quad (6)$$

This function has no particular specification. This is very important to
note that, to that point, there is a difference if we consider a price compe-
tition or a quantity competition. Indeed, the price competition allows to
express very easily the difference between a world price and the domestic
price as an *ad valorem* tariff. In a quantity competition, the particularity of
the expression of a tariff, usually considered as additive cost for importers,
offers less possibilities to analyze the tariff as the object of strategic inter-
action. However, since it is about quantity competition, we will apply the
same reasoning than in the price competition.

In the price competition, the government policy choice is a local price.
The *ad valorem* tax is defined as $\tau \equiv \frac{(p-p^w)}{p^w}$, where $p$ is the local price and $p^w$ is the world price.

By analogy with the price competition we find an equivalence of this
expression in a quantity competition. The *ad valorem* tax would then be
defined as $\tau \equiv \frac{(M^w-M)}{M^w}$, where $M$ is the local consumption of importations, and $M^w$ represents the total production devoted to the home market of a
hypothetic rest of the world.

We shall next explicit the difference between two frameworks. If this is a
price competition framework, the government set a local price as an optimal policy. If this is a quantity competition framework, the government set a local tax as an optimal policy. Then in the first situation, the government maximizes its welfare function to find an optimal local price of good $i$ such that

$$\nabla W(p_i^*) + \alpha \sum_{i=1}^{N} \nabla C_i(p_i^*) = 0$$

(7)

Using the expression of the *ad valorem* tariff in a price competition, it allows to find $\tau_i^* = f(c_i^l, p_i^*)$.

In the second situation, the government maximizes its welfare function to find an optimal tax such that

$$\nabla W(\tau^*) + \alpha \sum_{i=1}^{2} \nabla C_i(\tau^*) = 0$$

(8)

Using the expression of the local consumption of importations allows to find $M^* = g(c^l, \tau^*)$.

Since in a price competition the objective of a firm is to obtain a most favorable local price, it sets an objective of an *ad valorem* tax. In the quantity competition the objective of the firm are in quantities, then it sets the level of importation consumed on the local market as an objective.

Therefore in the first stage, firms maximize the following profit function

$$\pi^c_i = \pi_i - C_i$$

(9)

where $C_i$ is the contribution they expect to effectively pay. A firm maxi-
mizes its profit over the contribution schedule such that
\[ \nabla \pi(c^*_i) - \nabla C_i(c^*_i) = 0 \] (10)

This maximization program yields the following result
\[ c^*_i = \delta_i F(p^*, c^*_j) + \delta_j G(\tau^*, c^*_j) \] (11)

where \( \delta_i \) is a variable that equals 1 if it is in a price competition, 0 otherwise and \( \delta_j \) is a variable that equals one if it is a quantity competition, 0 otherwise.

Then, the firm has designed a contribution schedule that maximizes its profit and that is shaped to optimally respond to the tariff policy of the government.

3 Policy choice under price or quantity competition

In price competition framework, the effect of a marginal policy change on the social welfare is given by
\[ \frac{\partial W}{\partial p_i} = y_i(p_i)(\lambda - 1) + (p_i - p_i^w)m_i' \] (12)

Since the welfare of a lobby is restrained to the profit of the firm, a marginal change of the policy on good \( j \) has no effect on the welfare of the other lobbies. This is different from the Grossman and Helpman framework and this difference is due to the welfare of the lobby. Indeed, considering that lobbies are also interested in social welfare because their members are con-
sumers implies that the slight change in the policy on an other good will affect their consumer surplus.

In a quantity competition framework, the effect of a marginal policy change on the social welfare is given by

\[
\frac{\partial W}{\partial \tau} = m_i + \frac{\partial p_i}{\partial \tau} (1 - p_i) + \frac{\partial d(\tau)}{\partial \tau} + \lambda \frac{\partial \pi_i}{\partial \tau} + \tau m'_i
\]  

(13)

Whatever the form of the competition, the marginal effect of a marginal change on the contributions received by the government is given by

\[
\frac{\partial \alpha \sum_{i=1}^{N} C_i(p_i)}{\partial p_i} = \alpha c_{p_i}(p_i)
\]  

(14)

Now the optimal policies set by the government comes directly from the equations above

\[
(p_i^* - p_i^w) = -\frac{y_i(p_i)(\lambda - 1) + \alpha c_{p_i}}{m'_i}
\]  

(15)

for the price competition and

\[
\tau_i^* = -\frac{-d(\tau_i^*) \frac{\partial p_i}{\partial \tau_i} - y_i + d(\tau_i^*) + \lambda \frac{\partial \pi_i(\tau_i^*)}{\partial \tau_i^*} + \alpha c_{\tau_i^*}}{m'_i}
\]  

(16)

for the quantity competition.

This two results give the optimal policy set by government. Since \(m'_i\) is negative, both equation depends positively from the contribution schedule. Now in the next step, firms identify their objective and design their optimal contribution schedule.
4 Design of the contribution schedule

4.1 Bertrand competition

In a price competition framework, the objective of the firm is an *ad valorem* tariff. Therefore the expression the firm uses is the following

\[ t_i^* = \frac{-y_i(p_i)(\lambda - 1) - \alpha c_{p_i}}{p_i^{\mu}m_i^\prime} \]  

(17)

Then the firm maximize its profit over the contribution schedule as depicted in a previous section. The profit and the contribution are expressed as a function of the objective chosen by the firm

\[ \frac{\partial \pi_i^c}{\partial c_{p_i}} = \frac{\partial \pi_i(t_i^*(c_{p_i}))}{\partial c_{p_i}} - \frac{\partial C_i(p_i^*)}{\partial c_{p_i}} \]  

(18)

We can use the particularity of our contribution schedule to solve this program

\[ \frac{\partial C_i(p_i^*)}{\partial c_{p_i}} = \frac{\partial C_i(t_i^*(c_{p_i}))}{\partial c_{p_i}} \]  

\[ \Leftrightarrow \]  

\[ \frac{\partial C_i(t_i^*)}{\partial c_{p_i}} = c_{p_i} \frac{\partial p_i^*}{\partial c_{p_i}} \]  

(19)

The then we have the following result for the optimal contribution schedule

\[ c_{p_i}^* = \frac{\partial \pi_i(t_i^*)}{\partial \tau_i^*} \frac{\partial \tau_i^*}{\partial c_{p_i}} \frac{1}{\partial p_i^*/\partial c_{p_i}} \]  

(20)

**Proposition 1** The optimal contribution set by a firm in order to influence the
government in a price competition framework is

\[ c_{p_i}^* = \frac{\partial \pi_i(\tau^*_i)}{\partial \tau^*_i} \frac{1}{p^w} \]

(21)

As expected, the contribution schedule is sensitive the reaction of the profit to the ad valorem tariff and it is decreasing in the world price. Therefore, we find a result quite similar to the result of Grossman and Helpman (1994). Indeed, the contribution schedule is shaped to almost represent true preference of the firm. Considering that \( t^*_i = \frac{p^*_i - p^w}{p^w} \), it is easy to show that \( \frac{\partial \tau^*_i}{\partial p^*_i} = \frac{1}{p^w} \), then the contribution schedule is equal to

\[ c_{p_i}^* = \frac{\partial \pi_i(\tau^*_i)}{\partial \tau^*_i} \]

(22)

Therefore, the contribution schedule designed by the firm is truthful as defined in the lemma 2 in Bernheim and Whinston (1986) or in the proposition 1 in Grossman and Helpman (1994) in that sense that they truly reflect the preferences of a firm.

Therefore, even if the government does not maximize the welfare of the lobbies and its aggregate welfare simultaneously, the contribution schedule that arises is truthful.

However, there is an important difference. In the right hand side of the contribution schedule equation it still some terms of the contributions schedule. Therefore, when this equation is developed in a particular example, the contribution schedule we find is not anymore equal to the partial of the profit regarding to the policy. This is due to the particular form of the game and the form of the contribution schedule. Indeed, the contribution schedule designed by this firm allows to insert directly in the contribution schedule the optimal choice that the firm will do.
4.2 Cournot competition

There, the firm has an objective of a quantity imported on the local market. Then the firm uses the following expression

$$m^*_i = \frac{[m'_i - d(\tau^*_i)\frac{\partial p}{\partial \tau^*_i} - y_i + \lambda \frac{\partial \pi_i(\tau^*_i)}{\partial \tau^*_i} + \alpha c_{\tau^*_i}] m^w}{m'_i}$$ (23)

Then the firm maximizes its profit over the contribution schedule as depicted in a previous section. The profit and the contribution are expressed as a function of the objective chosen by the firm

$$\frac{\partial \pi^*_i}{\partial c_{p_i}} = \frac{\partial \pi_i(m^*_i(c_{\tau_i})))}{\partial c_{p_i}} \frac{\partial C_i(\tau^*_i)}{\partial c_{p_i}}$$ (24)

We proceed as we did in the previous subsection and use the particularity of our contribution schedule to solve this program

$$\frac{\partial C_i(\tau^*_i)}{\partial c_{p_i}} = \frac{\partial C_i(\tau^*_i)}{\partial \tau^*_i} \frac{\partial \tau^*_i}{\partial c_{p_i}}$$ \(\Leftrightarrow\) $$\frac{\partial C_i(\tau^*_i)}{\partial c_{p_i}} = c_{p_i} \frac{\partial \tau^*_i}{\partial c_{p_i}}$$ (25)

The then we have the following result for the optimal contribution schedule

$$c^*_{p_i} = \frac{\partial \pi_i(m^*_i)}{\partial m^*_i} \frac{\partial m^*_i}{\partial c_{\tau_i}} \frac{1}{\partial \tau^*_i / \partial c_{p_i}}$$ (26)

**Proposition 2** The optimal contribution set by a firm in order to influence the
government in a price competition framework is

\[ c^*_i = -\frac{\partial \pi_i}{\partial m^*_i} m^w \] (27)

As in the price competition case, we find that the contribution schedule is truthful. Then this is a very interesting result since we find that these equilibria are truthful without using all the specifications stated in the lemma 2 of Bernheim and Whinston (1986). The truthful equilibrium may be defined by considering that the contribution schedule have to maximize the profit function of the firm.

**Proposition 3** Whatever the form of the competition, the contribution schedule designed by a firm that uses it to maximize its profit is truthful.

5 The homogenous good case

In this situation, we will have the following optimal policies, which of course are unique. There is one for the price competition and one for the quantity competition.

We find the following optimal policies:

\[ (p^* - p^w) = -\frac{y(p^*) (\lambda - 1) + \alpha \sum_{i=1}^{N} c_{p,i}}{m'} \] (28)

for the price competition and

\[ \tau_* = -\frac{-d(\tau^*) \frac{\partial p}{\partial \tau^*} - y + \lambda \sum_{i=1}^{N} \frac{\partial \pi_i(\tau^*)}{\partial \tau^*} + \alpha \sum_{i=1}^{N} c_{\tau,i}}{m'} \] (29)

for the quantity competition. The contribution schedule and profit still being denoted by a subscript \( i \) because they may differ from a firm to another.
denotes the total local production. The main difference with the situation of the differentiated good is the presence of the contribution schedules in the optimal policies.

If we use the same method than for the differentiated case, we find the following expressions used by a firm whether it is in a Cournot competition or in a Bertrand one

\[ t^* = -\frac{y(p^*)(\lambda - 1) - \alpha c_{p,i}}{p^w m'} \quad (30) \]

for a price competition and

\[ m^* = \frac{[m' - d(\tau^*) \frac{dp}{d\tau^*} - y + d(\tau^*) + \lambda \sum_{i=1}^{N} \frac{\partial \pi_i(\tau^*)}{\partial \tau^*} + \alpha \sum_{i=1}^{N} c_{\tau,i}]}{m'} \quad (31) \]

for a competition by quantities.

These two results give the optimal policy set by government. Since \( m' \) is negative, both equations depend positively from the contribution schedule.

Now in the next step, firms identify their objective and design their optimal contribution schedule. The program of a typical firm is the same. But now they find an optimal contribution schedule that is a reaction function to the other contribution schedules due to the fact that the policies set depend on all the contributions. Therefore, the more a firm is sensitive to the policy set, the more it will pay to the government. If we take the example of the Cournot competition. Each firm has a profit that is increasing in \( \tau \). The more its cost is high, the less an increase of \( \tau \) is important. Therefore, the higher the is, the lower the firm pay.

**Proposition 4** When firms produce an homogenous good, they more productive
firms designed the highest contribution schedules and therefore achieve the highest contributions.

This proposition contrast with a result of Grossman and Helpman (1994) where they find that the more generous contributors are the less productive special interest group.

6 Conclusion

In this paper we have try to develop a method to determine the optimal contribution schedule as a strategic tool for a firm. If we refer to the Grossman and Helpman (1994) framework, the first stage of their game allows them to characterize an equilibrium policy that is sustainable with truthful contributions. Then, their second stage consists in finding the optimal choice of a firm. In our model, the contribution has not to be initially truthful as it is defined in the Grossman and Helpman framework. The contribution schedule that is designed by the firm is already optimal and will take into account all the possible interactions with the other firms. However, the contribution schedule found may be consistent with the truthful equilibrium definition under particular conditions. More precisely, the contribution schedule that arises is truthful if the partial of profit regarding to the policy tool of the government is constant.

An other interesting result is that when firms produce the same good, this is the more productive firm that will pay the highest contribution. This result is in contrast with a finding of Grossman and Helpman (1994). This could justify why the government directly help the firm in difficult situation. Therefore, it should be interesting to distinguish between the policy changes obtained because the firm influence the government and those due
to a pure social consideration. The fact that the more productive pay more and therefore obtain more protection may imply that protections of sector in difficulty are decided by the government.
References


