The Institutional Microeconomics of Positional Goods

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ABSTRACT. Positional goods are a subset of economic goods whose consumption (and subsequent utility), also conditioned by Giffen-like pricing, depends negatively on consumption of others. We, hence, present a microeconomic foundation of positional good, in accordance with textbook treatment of the consumption of standard economic goods, i.e. private and public good. In particular, positional good is here defined as both double rival and double excludable good. It leads to institutional concerns, which we explore in the article.

Keywords: Positional good, Relative Consumption, Veblen Effect.

JEL Code: D01, D11, D62, H23.

1. INTRODUCTION

If the economy consisted of a complete set of perfect markets, then *social* interactions (except for strict exchanges) among persons would be an irrelevant consideration in resource allocation. Rejection of this assumption provides the starting point for analyses of positional goods. Striving for positional goods inherently involves externalities and social concerns – *if you go up, I come down* – that affect individual consumption and incentive structures.

Marx (1849) and Galbraith (1958), *inter alia*, note that agents' wants, demands and pleasures are largely influenced by society; Veblen (1899) emphasizes the importance of one's relative position in society, with reference to the concept of conspicuous leisure and consumption; while Marshall (1961: 12) recognizes "the power and prevalence of the human desire for distinction."

However, was Fred Hirsch to coin the concept of "positional good" in *Social Limits to Growth* (1976). He explained that the positional economy is composed of

> all aspects of goods, services, work positions and other social relationships that are either (1) scarce in some absolute or socially imposed sense or (2) subject to congestion and crowding through more extensive use (Hirsch, 1976: 27).

Hence, Hirsch distinguished categories of positional goods (cf. also Matthews 1997, and Schneider 2007). Some depend, essentially, on their relative positions (pride of superiority, status and power); others, such as land for leisure activities or land for suburban housing, are positional merely because their total amount is fixed. We focus on the former, because they represent the most palpable original contribution to the theory.[1] Indeed, Hirsch's main contribution is his assertion that positional goods are inextricably linked to social scarcity.

Let's consider the case of Robinson Crusoe. Before Friday's arrival, Robinson is limited only by nature, and his time and energy are expended only on efforts to maximize his use of the island's natural resources for his survival. When Friday arrives, Crusoe has to spend part of his time and energy acquiring *power* and *status* over Friday. Thus, from the moment of Friday's arrival, Crusoe begins to

[1] In fact, Hirsch's definition of positional economy as involving scarce goods, in some absolute sense, seems to be the same condition for standard economic goods. Their scarcity is due to the non-renewable or limited nature of their resources. Similarly, the condition of congestion or crowding, when use is extensive, seems to recall the concept of common goods.

consume positional goods and join in social scarcity. Moreover, only after the appearance of Friday does Robinson Crusoe start to compete with his "island-mate" for positions.

Our work is aimed at re-assessing the notion of positional good and extending the textbook treatment of the standard economic classification of private and public goods, to include positional goods. The main result is represented in the figure 1.

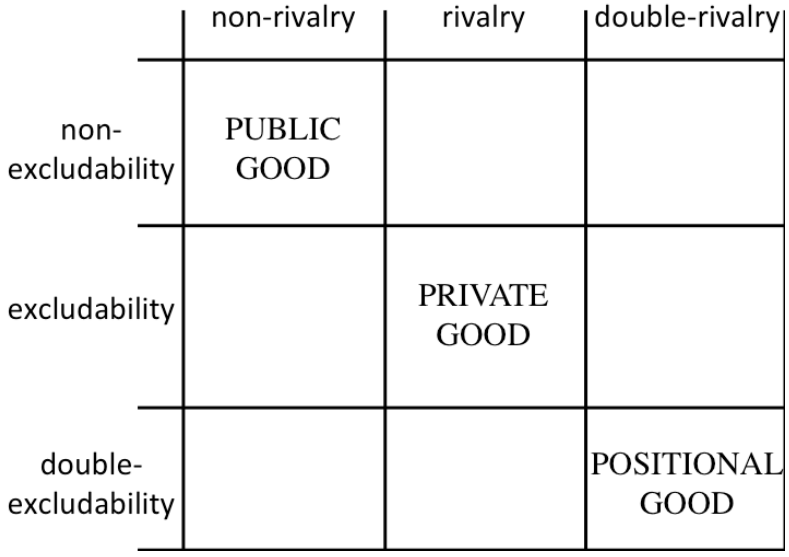

Figure 1. Double-Rivalry and Double-Excludability

Positional good is here defined as a double rival and double excludable good in the consumption. Indeed, agents are rival – like the case of private good – on the positive consumption of positional good (and its returns), and, in addition, agents are rival – unlike the case of private good – on the negative consumption of positional good (and its returns). For this reason, we say that the positional good is double rival. Moreover, who consumes a positive level of positional good must be able – like the case of private good – to exclude others by its returns and, in addition, must be – unlike in the case of private good – excluded by returns stemming from the negative consumption of positional good. For this reason, we say also that the positional good is double excludable.

Under these conditions on rivalry and excludability, we investigate diverse kinds of provision of positional good: by means of individual purchases (but in absence of distinct markets for positive and negative levels of consumption), with a Lindahl solution and by a government intervention. We find that concerns arise because both private and public mechanisms fail to register consumer preferences.

Finally, double rivalry and double excludability suggest a complex and costly institutional arrangement, more complex and costly than the case of private good. What emerges is that the overinvestment in positional good and high pricing are reactions to institutional failures brought about shortcomings on rivalry and excludability in the consumption of positional good.

The remainder of the work is structured as follows. Section 2 offers a review of main definition of positional good and introduces the preliminary issues. Section 3 investigates analogies and differences between the optimal levels of consumption among economic goods (private, public and positional goods – that is, the triad of economic goods). Section 4 is dedicated to illustrate concerns of both private and public provisions of positional goods. In Section 5, positional goods are analysed in terms of their consumption characteristics and we illustrate institutional failures involving positional goods. Section 6 remarks our main results.

2. LOOKING FOR A DEFINITION

Social scarcity relates to the relative standings of different individuals and arises not from physical or natural limitations, but from social factors.[2] For instance, the land in Montioni National Park is physically scarce, while political leadership positions are socially scarce. Karl Polanyi likewise notes that social scarcity is different from physical or natural scarcity.

> [Physical and natural] scarcity reflects either the niggardliness of nature or the burden of the labor that production entails. But the highest honors and the rarest distinctions are few for neither of these two reasons. They are scarce for the obvious reason that there is no standing room at the top of the pyramid [...] They would not be what they are if they were attainable to

[2] For a review of antecedents of the notion of social scarcity, see Ancil and Hakes (1991), which covers all major theories dating back to Aristotle.

> many [...] Scarcity derives from the non-economic order of things (Polanyi 1968: 94).

There are, moreover, also cases in which goods have both physical and social scarcity. One example is represented by the tower. Towers are scarce because the physical (i.e., materials) and natural (i.e., land) factors involved in their large-scale production are scarce, while the tower's status as the tallest building is socially scarce, due to the fact that it is defined in relation to the positions of other buildings and to the fact that *only one* building can be the tallest.

One early instance of positional economy comes from San Gimignano – a Tuscan medieval town. San Gimignano is considered the Manhattan of the Middle-Ages for its towers – in the past there were about eighty towers. Towers were not built by aristocratic families to live within them, but to "demonstrate" to community, the power, the affluence and the status of each family. In this case, the owner of tower consumed a positive level of positional good, like power, instead the family which did not own tower or owned a lower building consumed a negative level of positional good, that is, it consumed the exposure stemming from the power of the owner. For this reason, there is a zero-sum game in the family consumptions. There is a party consuming a positive amount of positional good and at the same time there is a counterpart consuming a negative amount of such a good.

However, the aristocratic family – owner of tower – enjoyed the positive consumption of positional good, namely it had a positive utility deriving from positional good. On the contrary, the family – non-owner of tower – suffered from the negative consumption of positional good (the consumption of exposure to power of others), namely it had a negative utility. For this reason, there is a zero-sum game in the family utilities.

Lastly, towers were not built stuck to each other; it would have reduced the construction costs because a part of walls would be shared. Instead, among towers there is a gap; but this gap is not large enough for a person to pass throw: it is the size of a brick. The reason of this gap and its size is to keep costs of construction high, and to deny the positive consumption of a positional good to families, which were not rich enough to build the entire edifice. For this reason, positional good is related to a higher pricing.

The case of San Gimignano's towers explains three meanings of positional good, each one resting on the idea of social scarcity: I) the first one based on a zero-sum game in the consumptions, II) the second one based on a zero-sum game in the payoffs (utilities), and III) the third one related to higher pricing mechanism to deny the consumption of others. We start from the first meaning and we derive the other two from the first one.

The definition centred on a zero-sum game in the consumptions is originated from contributions of Ugo Pagano (1999, 2007).

Definition I. Zero-sum game in the consumptions. When one party's level of consumption is positive, then at least one other party's level of consumption must be negative.

In a two agents context, a pure positional good is a good whose positive consumption z_1 for agent 1 is related to the equal negative consumption z_2 for agent 2, or $z_1 + z_2 = 0$.

Representing in a Cartesian plane (Figure 2) with consumption for agent 1 on abscissa and consumption for agent 2 on ordinates, a given amount Y of good describes a public good when it could be depicted by the point $(Y;Y)$ in which both agents consume the same positive amount Y of such a good. The good is private when there is a negative ratio between two consumptions, but the sum of the two consumptions is the total amount X; hence the line $(X;0)(0;X)$. Finally, a good is positional when there is $z_1 + z_2 = 0$ which is represented by the line $(+z_1;-z_2)(-z_1;+z_2)$.

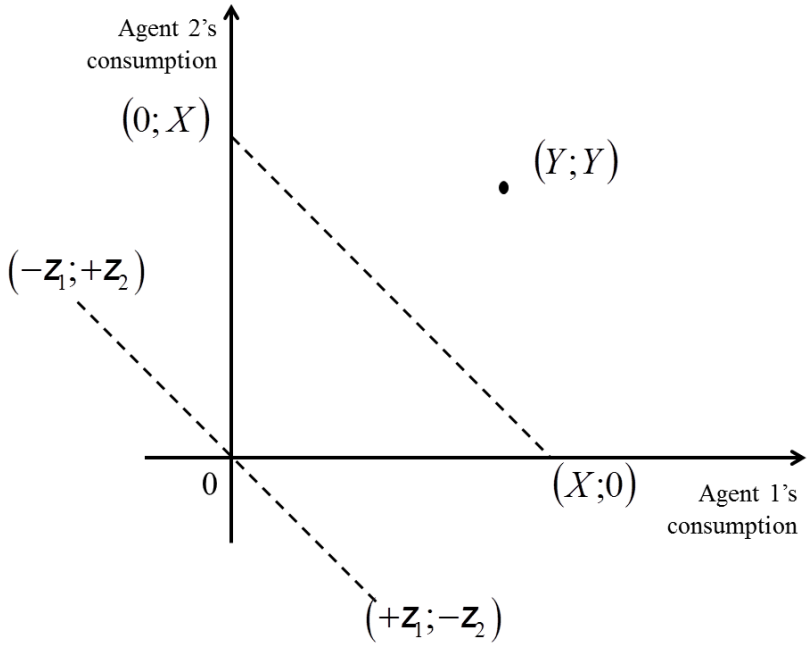

Figure 2. Placing Positional Goods

Note that a positional good has a character of *public-ness* in its consumption, albeit with the opposite sign respect to public good.[3] The positive consumption of a positional good for one agent implies, in the case of positional good, a negative consumption for the counterpart, while implies, in the case of public good, a positive consumption for the counterpart.

However while the dimension of positional good is binary, the net (utility) impact of a positional good may be positive, zero or negative. The individual utility derives from the individual preferences on the level of consumption. It means that, we can imagine that an individual may actually benefit from the negative consumption of a positional good, such as a masochist who may revel in being deprived of power; this case has an analytical framework completely analogous to the treatment of public good. Symmetrically, due to her preferences, an individual may actually suffer from the positive consumption of a public good. An example would be an enemy alien during time of war, who suffers from increased defence expenditure.[4] The latter circumstance calls for a restraining condition as follows.

Assumption A. Positive (negative) consumptions imply positive (negative) utilities. A positive level of consumption of a certain good brings to a positive utility, while a negative level brings to a negative utility.

That is, if we assume that the utility is positively related to the level of consumption, then it leads to the second kind of definition of positional goods.

Definition II. Zero-sum game in the payoffs. Positional goods are goods whose utility of their consumptions is relative (negatively) to the consumption of the others.

Probably the best example of such a definition is Duesemberry's relative income. It is not the absolute level of income that matters most but rather this level respect to level of income of other individuals. Indeed, as Duesenberry (1949) observed, agents care not only about their own consumption levels, but also about their consumption levels relative to those of other households in their reference groups (cf. also Leibenstein 1950). Duesenberry described the so-called "demonstration effect", which is when a person suffers felicity loss when others' consumption levels rise, because his relative consumption now declines. Departing from the concept of standard utility, Duesenberry's proposal prompted studies on the concept of interdependent preferences (e.g., Akerlof and Yellen 1990, Becker 1974, Boskin and Sheshinski 1978, Easterlin 1974, 1995, Elster 1991, Elster and Roemer 1993, Frank 1985a, 1985b, 1999, Hopkins and Kornienko 2004, Ng 1987, Pollak 1976, Schelling 1978, Scitovsky 1976).

[3] See Myles (1995) for a proper treatment of 'publicness' of public goods.

[4] I am indebted to Michael Schneider for these examples.

As a result, not only is the absolute level of an individual's situation important, but also her relative position (Andreoni 1995, Ball *et al.* 2001, Fehr and Gachter 2000, Hopkins and Kornienko 2004, Solnick and Hemenway 1998). In other words, in many social situations, the behavior of individuals does not always support the hypothesis that the points scored in status games are being maximized. Nor do behavioral patterns support the hypothesis that utility functions positively correlate with maximal scores (cf. Shubik 1971). Thus, individuals may decide to maximize not their absolute payoffs (namely, their scores), but their relative payoffs. This means, moreover, that the satisfaction of an individual's preferences can alter the ways in which others seek to satisfy similar wants.

A last definition of positional good derives from the so-called "Veblen effect" (cf. Leibenstein 1950, Frank 1985a, 1985b), which is witnessed whenever individuals are willing to pay higher prices for functionally equivalent goods (a very significant example is the luxury goods market).[5] The Veblen effect also implies that a sufficient decrease in price leads not to an increase in demand, but to a decrease, because the social status derived from acquiring the goods in question may fall (remember the role of gap among San Gimignano's towers!). It means that,

Assumption B. The role of price. Higher pricing can be an endogenous way of excluding others from consuming positive amounts of certain goods.

This assumption means that in the case of positional goods, setting high prices is an endogenous way of signalling positions in society. The more is equality, the higher is the incentive to raise prices for positional goods. By contrast, the lower the price, the lower the level of competition, because the claims of *owners* (e.g. of towers) are not effectively protected. It leads to,

Definition III. Positional good and pricing. Positional goods are goods for which the satisfaction derives (at least in part) from higher pricing.

This brings us to an intriguing parallel between positional goods, such as "luxury goods", and what are known as "Giffen goods". As noted by Schneider (2007), as early as 1834, Rae observed that in the case of "mere luxuries", while a halving of the price would require a doubling in the number of units purchased, in order to satisfy vanity to the same extent, a reduction of the price to a small fraction of its previous level would reduce demand to zero. Cournot (quoted in Schneider, 2007) also admitted that some goods "of whim and luxury [...] are only desirable on account of their rarity and of the high price which is the consequence thereof [...] [i]n this case a great fall in price would almost annihilate the demand." Similarly, de Tocqueville (1966) argued that demand for luxury goods increases

[5] An early diagrammatic exposition of this effect is found in Cunninghame (1892).

when their prices rise, because the desire for inequality is always inversely proportional to the degree to which equality is achieved.

Taking together these three definitions, we can say that, positional goods are a subset of economic goods whose consumption (and subsequent utility), also conditioned by Giffen-like pricing, depends negatively on the consumption of others.

3. THE TRIAD OF ECONOMIC GOODS

In a n-context, indicating with the subscript i the quantity consumed by ith individual, the relationship between individual and total consumption of ptivate good is

$$x_1 + x_2 + \ldots + x_n = X \qquad [1]$$

where x_i is the ith individual's consumption of the private good. In the case of public good, the relationship between individual and total consumption is

$$y_1 = y_2 = \ldots = y_n = Y \qquad [2]$$

Finally, in the case of positional goods the relationship between individual and total consumption, following definition of Pagano, is

$$z_1 + z_2 + \ldots + z_n = 0 \qquad [3]$$

It is worthy pausing in order to note the fact that the null total consumption of positional good does not imply that production costs are null. In the case of towers of San Gimignano, the zero-sum game in the consumptions is very costly for the building costs. Moreover, in order for a positional good to be cherished, the majority of a society must reach a consensus about the positional good's high status (cf. Marshall 1977, and Pagano 1999). Namely, the pre-condition of positional goods is the costly "production" of a system of evaluation shared by all individuals involved in the consumption of these goods. Costs are null only when the positional good is not produced and, subsequently, not consumed. Instead, when the it is offered, thought the sum of consumptions of positional good is by definition null, the production costs are positive. Let's indicate with Z the sum of positive consumption and negative consumption in absolute; namely, $Z = \sum_i \|z_i\|$.

Then we have $Z = 0$ only when the positional good is not furnished, while with $Z \neq 0$ we have that $\sum_i z_i = 0$.

A positional good enters production function $g(\cdot)$ (twice differentiable) in the same way that public and private goods do: $g(X; Y; Z)$. So, we can interpret the marginal rate of transformation between a positional good z and a private good as the marginal cost of z in terms of the private good, and we can denote it with $c(Z)$. Finally, we adopt a partial equilibrium perspective by assuming that the quantity of the positional good has no effect on the prices of the private good x and that each consumer's utility function is quasilinear with respect to the same numeraire x. Positional goods enter utility function $f(\cdot)$ (twice differentiable) just as do other economic goods, too. So an individual's marginal rate of substitution between a positional good and a private good is the amount of the private good she would be willing to give up for an additional unit of the positional good. When we took into account public, private and positional goods, the utility functions for the two agents $i = \{1,2\}$ becomes:

$$f_1(x_1; Y; \pm z); f_2(x_2; Y; \mp z)$$

We denote the marginal valuation of positional good z in terms of the private good with $v_i(z)$.

However, one cannot exclude cases of goods that are public goods for one group of individuals and are, at the same time, positional goods for another group of individuals. National security is one of these goods; it is considered to be the textbook case of public goods. But, the consumption of national security by the individuals of some nation can involve a corresponding consumption of national "insecurity" by the individuals of a rival nation and, hence, be an example of a pure positional good (cf. Pagano 1999).

Now, consider a setting with one positional good and two types of consumers i: one is indicated by $\underline{i}$ and the other by $\overline{i}$. The former represents the subset of consumer whose consumption is negative, while the latter the subset of consumers whose consumption is positive. Therefore, the marginal social value of unit z of positional good in terms of a certain private good is given by:

$$\sum\nolimits_{\overline{i}} v_i(z) + \sum\nolimits_{\underline{i}} v_i(z)$$

In this quasi-linear model, any Pareto optimal allocation must maximize aggregate surplus (if positive). The necessary and sufficient first-order condition for the optimal quantity z^* is then

$$\sum_{\bar{i}} v_i(z^*) + \sum_{\underline{i}} v_i(z^*) = c(Z) \qquad [4]$$

Note the analogy with the Samuelsonian optimality condition for a public good y:

$$\sum_i v_i(y^*) = c(Y) \qquad [5]$$

The analogy is due to the "public" character of both types of goods. For both types, consumption by an individual implies a certain level of consumption for others: if one individual consumes more public good, all agents will consume more public good; on the contrary, if one individual consumes more positional good, at least one other agent will consume a more negative level of positional good. These goods imply 'external economies' derived from an intrinsic 'jointness demand'.[6]

Introducing the assumption A, we have that $\underline{i}$-type consumers have negative marginal valuations, whilst $\bar{i}$-type ones have positive marginal valuations. Then [4] can be rewritten as

$$\sum_{\bar{i}} v_i(z^*) - \sum_{\underline{i}} \|v_i(z^*)\| = c(Z) \qquad [6]$$

Under this standard assumption on individual preferences, for the optimal level of positional goods, the difference between consumers' positive marginal valuation(s) and consumers' negative marginal valuation(s) is set equal to its marginal cost.

Conditions in [5] and [6] should be contrasted with the condition of a private good, where *each* consumer's marginal benefit from the individual consumption of the good is equated to its total marginal cost. For private goods each individual's marginal rate of substitution between two private goods should be equal to the marginal rate of transformation or, in terms of marginal valuation and marginal cost,

$$v_1(x_1^*) = v_2(x_2^*) = \ldots = v_n(x_n^*) = c(X) \qquad [7]$$

Notice the analogies and differences among the economic goods: public goods are defined by an *equality* of consumption levels [2], and the efficiency condition involves a *summation* of marginal valuations [5]; private goods are defined by a *summation* of consumption levels [1], and the efficiency condition involves the

[6] Cf. Samuelson (1954: 389) for the concept of 'jointness demand' in the case of public goods.

equality of marginal valuations [7]; positional goods are defined by a *zero-summation* of consumption levels [3], and the efficiency condition involves a *difference* of marginal valuations [6]. Diagrammatically, in the case of positional goods, the aggregate demand schedule is obtained from a vertical subtraction of agents' schedules, and not from a vertical summation of the individual schedules, as in the case of public goods (where agents consume the same levels of consumption), or from horizontal addition, as in the case of private goods (where individuals may consume different unrelated amounts).

4. INEFFICIENCIES IN THE PROVISION OF POSITIONAL GOODS

Consider the textbook circumstance in which the positional good is provided by means of private purchases, but we cannot assess a market for each consumer (see Gravelle and Rees 1981). Analytically, we treat the supply side as consisting of a single profit-maximizing firm with cost function $g(\cdot)$ that chooses its production level taking the market price as given. At a competitive equilibrium involving price $\tilde{p}$, each consumer i must maximize her utility. Consumer i's purchases of $\tilde{z}_i$ must therefore satisfy the necessary and sufficient first-order condition

$$v_i(\tilde{z}_i) = \tilde{p} \qquad [8]$$

The firm's supply $\tilde{z}_i$, on the other hand, must satisfy the standard necessary and sufficient first-order condition

$$\tilde{p} = c(\tilde{z}_i) \qquad [9]$$

At a competitive equilibrium, [8] and [9] tell us that,

$$v_i(\tilde{z}_i) = c(\tilde{z}_i) \qquad [10]$$

By comparing [10] with [4], we see that the level of the positional good provided is inefficient. In this respect, the Smithian invisible hand fails because:

> [f]ar from being a principle that applies in most circumstances, the invisible hand is valid only in the special case in which each individual's rewards are *completely independent* of the choices made by others. In the rivalrous world we live in, precious few examples spring to mind. (Frank 1999: 271, emphasis added)

Now, suppose that for each consumer i we have a market for the positional good as experienced by consumer i. That is, we intend for each consumer's consumption of the positional good to be a distinct commodity with its own market. We denote the price of this personalized good by p_i. Unless marginal utility is the same for all, different persons may be left with different marginal benefits from the purchase of positional goods and, hence, p_i may differ among agents. Suppose also that, given the equilibrium price $\hat{p}_i$, each consumer i sees herself as deciding on the total amount of the positional good she consume, z_i, so that her equilibrium level $\hat{z}_i$ will satisfy the necessary and sufficient first-order condition, as in [8]

$$v_i(\hat{z}_i) = \hat{p}_i \qquad [11]$$

Unlike in [9], the firm is now viewed as producing a bundle of positional goods with a fixed-proportion technology. The firm's equilibrium level of total output therefore satisfies the necessary and sufficient first-order condition

$$\sum_i \hat{p}_i = c(Z) \qquad [12]$$

Together [11] and [12], along with the market-clearing condition imply that

$$\sum_i v_i(\hat{z}) = c(Z) \qquad [13]$$

By comparing [13] with [4] we find that the positional good consumed by each consumer is at exactly the efficient level: $\hat{z} = z^*$. This type of equilibrium in personalized markets for the positional good could be referred as a *Lindahl positional good equilibrium.*

However, the realism of the Lindahl positional good equilibrium is debateable. Note, first, that the ability to exclude a consumer from the use of the positional good is essential if this equilibrium concept is to make sense. Furthermore, the condition of publicness of positional goods does not permit a single most efficient solution only on the basis of an individual preference. (This is the analogous difficulty in the provision for public goods.) Indeed, suppose that we can order the $\underline{i}$-type consumer according to their marginal valuations, in the sense that $v_{\underline{i}}(z) < \ldots < v_{\overline{I}}(z)$ at all z. The variable $\bar{z}$ indicates the level of positional good such that $v_{\overline{I}}(\bar{z}) = c(\bar{z})$. This implies that if $z < \bar{z}$, then agent $\overline{I}$ will provide the level $\bar{z} - z$ because her marginal valuation is higher than the marginal cost. For the same reason, if $z = 0$, then agent $\overline{I}$ will provide the total amount of positional good. This means that agent $\overline{I}$ offers the total amount of positional good, while the other $\underline{i}$-type agents offer a null level. This Nash equilibrium brings to our attention the issue of free-riding problems. This problem would is analogous for the $\underline{i}$-type consumers, as well.

According to [6], indicating with $v_{\underline{I}}(z)$ the higher (in absolute) marginal valuation, if free-riding is not prevented, then the final level of positional good will be obtained as follows:

$$v_{\overline{I}}(z) - \left\| v_{\underline{I}}(z) \right\| = c(Z) \qquad [14]$$

From [14] we can derive the following results. First, the market is not competitive despite the large number of buyers and sellers. *De facto*, there is a duopsony whereby two agents decide on and pay for the level of positional good consumed also consumed by other agents. Secondly, What is more, intermediate agents' marginal valuations are not wholly accounted for in the calculation of the level. In addition, if the bargaining/competition involves only $\overline{I}$ and $\underline{I}$, then it is more conflictual, because these are the agents with more divergent valuations on the positional good. Lastly, free-riding problems are pervasive both in the set of agents $\overline{i}$ and in the set of agents $\underline{i}$.

The inefficiency of "private provision" could be remedied, as it has proposed for public goods, through governmental intervention in the provisioning. Such a provision is financed by a proper taxation which may define under two conditions. First, in accordance with a stream deriving from de Viti de Marco and bringing to 'voluntary exchange' theories of public finance of the Sax-Wicksell-Lindahl-Musgrave type, a citizen's duty to pay taxes must be matched by the duty of the state to provide for general public services. That is, the tax must be set as a price, designed to maximize the satisfaction that the consumer derives from the payment for the governmental services. And, the tax-financed public supply to accomplish the satisfaction of social wants must be traced to the preferences of individual members of the group. Secondly, as noted by Frank (1997, 2005), since the optimal tax in the classical externality example (i.e. pollution) depends on the aggregate harm caused by the pollutant in question and not on the motives of polluters, the taxation on positional externalities should it have nothing to do with motives (i.e., with Veblenian envy).

Put simply, an efficient taxation should assess an individual tax t_i in accordance with the individual marginal valuation. By rearranging [11], [12] and [13] we get $\hat{v}_i(\hat{z}_i) = \hat{t}_i$ and $\sum_i \hat{t}_i = c(Z)$. Then,

$$\sum\nolimits_i v_i\,(\hat{z}) = \sum\nolimits_i \hat{t}_i$$

If costs are to be allocated in response to individual preferences, different taxes must be charged to different consumers (or voters). But, similar to the Lindahl equilibrium, the realism of this assessment is questionable. Indeed, the intermediate agents (which have an intermediate marginal valuation) will

attempt to not reveal their valuations so that they can benefit from taxation of agent $\bar{I}$ and agent $\underline{I}$. In this respect, whenever taxation is a voluntary contribution, free-riding problems emerge. Let's paraphrase the problems incurred in the case of public goods:

> some may benefit more than others, but everyone knows that [...] [her] benefit will be independent of [...] [her] particular contribution. Hence [...] [she] cannot be relied upon to make a voluntary contribution. The government must step in, and compulsion is called for. [...] To do this, a way must be found to determine people's true preferences in social wants, i.e., the preference pattern by which they the rate the satisfaction of their total wants (Musgrave 1959: 10)

Both optimal direct governmental provision and its subsidy-tax scheme require that the government knows the marginal valuations derived by consumers from the positional good (i.e., their willingness for these goods). The problem is the fact that marginal valuations are unobservable, and the parties involved may not have incentives to reveal them truthfully if asked. Since the services that satisfy goods with public characteristic (such as public and positional goods) can be had without payment, the individual consumer does not need to reveal his evaluation thereof through bids. Because of this, signals are lacking and true preference scales for individual valuations are unknown.[7] As a result, the State either imposes a taxation assessment, even though it is lacking the correct knowledge of individual valuations; or it could set up a free-contribution with the hope that opportunistic behaviors will not emerge.

5. DOUBLE RIVALRY AND DOUBLE EXCLUDABILITY, AND RELATED INSTITUTIONAL CONCERNS

Imagine that production cost $g(\cdot)$ has constant returns of scale, that is, $c(Z) = \bar{\bar{p}}$, where $\bar{\bar{p}}$ indicates the price which exactly covers the production costs. Supposing a two-agent $i = \{1,2\}$ context, if the positional good is acquired by agent 1, then, since the assumption for demonstration effect, it determines that $v_1(+z) > 0$ and $v_2(-z) < 0$. When this occurs, the conditions of efficiency [6] requires that:

[7] We can also prove that Green and Laffont's (1977) results hold also for positional goods: as for public goods, in order to produce at an optimal level, a positional good has no satisfactory scheme in which economic transfers amount to zero and in which truth-telling constitutes a dominant strategy for agents.

$$v_1(+z) = \bar{\bar{p}} + \|v_2(-z)\| \qquad [15]$$

The condition in [15] implies that in order to achieve Pareto efficiency, the buyer of the positional good should pay not only the direct and indirect costs of production $c(Z) = \bar{\bar{p}}$ but also pay the costs of non-buyer's malaise $\|v_2(-z)\|$. Pareto efficiency for positional goods implies that the price is comprised of production costs *plus* the price of negative effects on those who suffer from the positional goods. Namely, the price should be a sort of 'double price.' (cf. Pagano 1999)

We illustrate this double price as the consequence of the two characteristics of the consumption of positional goods. Samuelson (1954, 1955) introduced the polar definition of private versus public goods based on their non-rivalry in consumption, and Musgrave (1959, 1969, 1983) suggested the criterion of exclusion in addition to rivalry. Here, we define positional good as both a double rivalry and a double exclusionary economic good.

The condition of non-rivalry in consumption means that in a two-agent context agent 1 and agent 2 enjoy the same output. This is the case for the public good. It differs for private goods, whose benefits from consumption are enjoyed by either agent 1 or agent 2 (indeed, private goods are rival). In the case of positional goods, rivalry involves both the *surplus* – namely the difference between the marginal valuation of the buyer and production costs, $v_1(+z) - \bar{\bar{p}}z > 0$ – and the *surminus* – namely the suffering derived from the negative consumption of a positional good, $v_2(-z) < 0$. Agents are rival on both of them: they try to obtain the surplus *and* to refrain from the surminus.

The need to refrain from surminus is absent for public goods, because there are not consumers of negative amount of these goods: if agent 1 is consuming a certain public good, then it means that also agent 2 is consuming the same amount of this good. The need to avoid surminus is absent also for private goods, because the non-buyer consumes a *null* level of these goods: if agent 1 is consuming a certain private good, then it means simply that agent 2 is consuming a null level of the given private good. Instead, in the case of a positional good, if agent 1 is consuming a positive level, then agent 2 is consuming a negative amount of the same positional good. Thus, there is 'more rivalry' in positional goods than in public goods and, above all, than in private goods. This higher level of rivalry can be labelled as "double rivalry"

The second characteristic regards the excludability. A consumer is excluded from the enjoyment of any particular commodity or service unless she is willing to pay the stipulated price to its owner. Musgrave (1959) refers to this condition as the exclusion principle. This principle holds for private goods (which are, in fact,

excludable), but it does not hold for public goods (which are non-excludable). For positional goods, excludability must include both the exclusion from surplus and the exclusion from surminus. If one of these mechanisms of exclusion is not in operation, the positional good is not wholly consumed. That is, if the agent who has paid for the positional good is not wholly excluded from surminus, or if the agent who has not paid for the good is not wholly excluded from surplus, then the positional good has not been wholly consumed.

Exclusion from surminus does not hold for public and, above all, for private goods. Therefore, positional goods have more excludability than private goods, and, consequently, we can say that they have "double excludability".

In this respect, double excludability and double rivalry may lead to differences in individual and social welfare. Since agents' choices produce externalities in the consumption of other agents, the problem of free-riding is implicit and is inextricably linked to the definition of positional goods, as well as public goods. This suggests that institutional solutions could be very costly, because they incorporate all external effects on consumption. As a result, the value of a positional good will depend on the allocation and mechanism rules that determine who is eligible to consume that particular good and how others are excluded from consuming it. Two institutional failures may emerge. Institutional solutions may fail to safeguard the claims of those who suffer the surminus and/or who enjoy the surplus. Let's start with the former.

Such a failure signifies that the agents benefiting from a positional good do not take into account the externalities of their respective sufferers. As a result, the consequences of institutional failures (e.g. the market for property rights), with respect to the under-provision of public goods

> have opposite signs. In the case of public [...] goods, the consequences of this failure implies that an agent consuming the public good does not get paid for other people's consumption; in the case of a positional [...] good, the equivalent failure implies that an agent consuming positive amounts is not charged for the negative consumption of other agent's consumption (Pagano 1999:71).

That is, while, in the case of public goods, we have the standard under-investment problem in their supply, because excluding individuals from externalities that have the "same sign" may turn out to be impossible, by contrast, in the case of positional goods, we have a problem of over-provision, because all agents may try to consume positive amounts of these goods, neglecting to consider the surminus of others. While institutional failure means, for public goods, an under-supply, for positional goods, it signifies an over-supply. In other words, in positional competitions, people work harder and consume more than

they would under optimal conditions. In this respect, the existing literature on conspicuous consumption, as a signal for status-oriented individuals, has shown how individuals may be tempted to over-spend, in order to reach a higher social status than the one they would get in case of *first best* (Bagwell and Bernheim 1996, Ali Choudhary and Levine 2006, Frank 1985a, 1985b, Ng 1987, Ireland 1994, 1998, Layard 2005, 2006, Schor 1998).

On the other hand, the failure of surplus is due to ineffective safeguarding of the claims of buyers of positional goods. Since the costs of enforcing double excludability are steep, agents involved in positional competitions may implement endogenous enforcements of these claims. For instance, from a Hohfeldian perspective, the race for power (a typical instance of positional good) is such an endogenous process (cf. Fiorito and Vatiero, 2011). Similarly, in the conspicuous consumption literature, individuals in market economies tend to over-spend to *impress* their neighbors. Consistently, Veblen (1899: 36) argued that "[i]n order to gain and to hold the esteem of men it is not sufficient merely to possess wealth or power. The wealth or power must be put in evidence, for esteem is awarded only on evidence." In other words, if status is conferred by wealth, but wealth is not wholly observable given institutional concerns, then conspicuous consumption is a means of signalling wealth in relation to that of others in one's reference group. Consistently, Veblen suggested that in advanced societies, conspicuous leisure takes the form of elaborate and costly idleness – namely, a way of *signalling* one's wealth to others in environments where wealth is not observable (Arrow and Dasgupta, 2009). In this respect, the price has a role of signalling and excluding others from positive consumption, as we recognized in the assumption B and in the consequent definition III on positional good as related to higher pricing.

Then, institutional concerns lead to over-investments in positional goods. Failures concerning the surminus brings about over-investment, i.e. over-supply, and reduce the Pareto efficiency by producing externalities for those who suffer as the result of the consumption of a positional good. And, failures concerning the surplus generates over-investment, e.g. investments in the signalling of social status, and help achieving the Pareto-optimum by reducing externalities for the consumers of positive amounts of a positional good. Therefore, level of over-investment can indicate both suboptimal Pareto equilibrium, when it stems from non-paid sufferers, and Pareto enhancement, when it derives from the improvement of the enforcement of consumption of enjoyer. In this respect, positional competition is very difficult to analyse in terms of efficiency, and the enormous diversity of empirical findings on conspicuousity (cf. Clark *et al.* 2008) should be interpreted cautiously.

6. CONCLUDING REMARKS

People constantly compare themselves to their environments and care greatly about their relative positions, which influence their choices. Therefore, the paradigm of *homo economicus* should be extended, so that positional goods are included in theories of individual consumption and social concerns are considered among the basic motivations for individual economic behaviour.

In this work, we have defined the triad of economic goods – private, public and positional goods – in terms of individual and total consumption. Private goods are characterized by the fact that they are consumed only by single individuals. The exclusion of others from positive amounts of consumption is impossible in the case of public goods. Instead, when some individuals consume positional goods, other individuals must be included in the consumption of related negative quantities. A pure positional good can be defined as a good of which a certain amount of positive consumption by one agent is matched by an equally negative amount of consumption by another agent. That is, in the case of positional goods, individuals' consumption levels have opposite signs.

Under a standard assumption on individual preferences, the optimal level of a positional good is reached when the difference between consumers' positive marginal valuations and consumers' negative marginal valuations is set equal to marginal cost of good. The fact that certain individuals must experience negative consumption of positional goods implies that their marginal rates of substitution must be subtracted from the marginal rates of substitution of individuals consuming the corresponding positive amounts of positional goods.

Free-riding problems emerge, because there is no optimal private or governmental provision of positional goods. This difficulty arises because both private and public mechanisms fail to register consumer preferences.

Furthermore, the definition of positional goods implies that agents are rival on and must be excluded from both the surplus generated by positive consumption and the surminus derived from negative consumption. Thus, following the textbook characterization of consumption of private and public goods, positional goods must be defined as both double rival and double excludable goods.

Finally, failures of institutional arrangement occur because of lacking of valid protection of the claims of parties involved in positional relationships. It implies that there may be a trade-off between the efficient safeguards of sufferers' claims and of enjoyers' ones. In particular, as we proved in our investigation, higher

pricing may be described as an endogenous means of enforcing the surplus derived from the positive consumption of positional goods.

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