Taxes, Status Goods, and Piracy

Alessandro Balestrino

Taxes, Status Goods, and Piracy

Abstract

This paper studies the design of indirect redistributive taxation and of corrective taxation, as well as the formation of equilibrium indirect tax policies via a political process, in the presence of status goods, allowing for the possibility that illegal copies of those goods may be purchased on black markets (the phenomenon of "piracy"). Heavy taxation of status goods, despite the fact these are typically overconsumed, is not particularly favoured in a social welfare maximisation context, because the tax rate is highly distortionary, due to the presence of piracy. Corrective taxation, aimed at remedying the inefficiencies associated with the consumption externalities generated by the status goods, is made ineffective by piracy. In contrast with the normative results, the median voter model predicts an inefficiently large tax rate on status goods when piracy is widespread.

Alessandro Balestrino
University of Pisa
Department of Economics
Political Sciences Faculty Building
via Serafini 3
Italy – 56126 Pisa
balestrino@sp.unipi.it

January 6, 2012

I. Introduction

This paper is placed at the crossroads between two branches of the economic literature, one dealing with taxation in the presence of shadow markets, and the other dealing with the production and marketing of illegal copies ("piracy"). While relying on both streams of work, it purports at the same time to introduce a new perspective.

On the one hand, the focus in taxation studies has been, since the seminal paper by Allingham and Sandmo (1972), in very general terms on the coexistence of a standard sector and an irregular one, whose activity is outside the realm of tax policy.[1] On the other hand, virtually the whole recent literature on piracy (e.g. Peitz and Waelbroeck 2003) is devoted to the issue of digital copies, and the focus is mostly on how society at large or even the legitimate producers might conceivably *gain*, rather than lose, from piracy.

This paper considers a well-defined illegal sector, thereby differentiating itself from the generalist approach of most tax models, but does not focus on digital copies, rather on the reproduction of fashion goods, taking therefore a different view from the majority of piracy studies (an exception is the paper by El Harbi and Grolleau 2008, that deals exactly with the piracy of high-end fashion items but ignores tax issues). The illegal fashion market is believed to have peculiarities that matter for tax design, with specific reference to the indirect taxation of luxury *versus* non-luxury goods. The paper also tackles specifically the question whether piracy impacts on the effectiveness of the tax system, both in terms of efficiency and of equity.

The reason why I have chosen to investigate the faking of fashion items rather than of CDs, DVDs and software is that, while both illegal markets are huge[2] and thus deserve our attention, the former is less well-known and has some peculiarities arising from the fact that modish, trendy goods can be seen as conveying information on the status of their owner. More precisely, they might be what Hirsh (1976) has called "positional" goods, commodities whose consumption matters only or mostly in relative terms: they signal, by their relative abundance, the status of those who consume

---

[1] In this respect, the theoretical problems are similar to those faced when studying taxation in the presence of household production, which may be regular but is nevertheless hard to tax. The seminal work in this area is Sandmo (1990).

[2] According to the Counterfeiting Intelligence Bureau, a branch of the International Chamber of Commerce, about 10% of all trade concerns fakes. The largest markets are Corea, Taiwan and Italy, in decreasing order of magnitude. Taking Italy as an example, we find that the total value of the faked goods is roughly estimated at 7 billion euros per year; clothes and apparel account for 36,7% of this value, while the corresponding figure for digital copies is 23% (Penelope, 2011).

them. A string of interesting and innovative papers on status effects has appeared over the years in top journals such as *AER*, *JPE* and *JPubE* (e.g. Frank 1984, Glazer and Konrad 1991, Konrad and Lommerud 1993, Bernheim 1994, Bagwell and Bernheim 1996, Clark and Oswald 1998, Dupor and Liu 2003), accompanied by equally well-published empirical confirmations of the relevance of the phenomenon (e.g. Solnick and Hemenway 1998 and 2005, Ferrer-i-Carbonell 2005) and applications to public finance (e.g. Boskin and Sheshinski 1978, Ireland 1994 and 2001, Corneo and Jeanne 1998, Corneo and Gruner 2000, Corneo 2002, Micheletto 2008 and 2009).[3] There is also a small literature that deals specifically with tax dodging in the presence of relative consumption effects, although the focus is on income taxation (see e.g. Balestrino 2009 and Goerke 2011). However, the approach is still liable to be judged unorthodox, and for this reason, I will propose in the next section a defence of the chosen characterisation of luxury goods as status-signalling ones. For now, I wish to explain why such a characterisation might impact on the design of indirect taxes.

The above-mentioned peculiarities are two. First, the fact that the agents care for relative, as opposed to absolute, consumption breaks the link between competitive markets and efficiency, as it induces a "consumption externality" normally leading to overconsumption (Dupor and Liu 2003). Clearly, this must be accounted for in the tax design; and several studies among those cited above have already dealt with some aspects of this issue, especially Corneo and Jeanne 1998 and Micheletto 2008 (the other contributions in public finance are prevalently concerned with income taxation). Second, the reason why fashion goods are so often faked is exactly that they have mostly a signalling value: nothing of this sort can happen to ordinary, non-status goods. One cannot counterfeit milk in any meaningful sense of the word – the nutritive properties of milk are needed by our bodies, and adding melamine to "fake" its protein content isn't going to work.[4] But one can easily counterfeit a MiuMiu purse, since all it takes is to manufacture something that *looks* like a MiuMiu purse – both the genuine article and the fake can then be used in the same way.[5] Being marketed outside the legal markets, fakes cannot be the object of tax policy, but their

---

[3]The list, impressive as it might be, is far from being complete: see Truyts (2008) for a much more comprehensive bibliography.

[4]In 2008, China's health ministry declared that "almost 300,000 babies were taken ill due to contaminated milk powder" that year. The contaminant was melamine and "the crisis caused public outrage because it is thought the chemical was added deliberately to allow substandard milk to pass nutrition tests" (Bratigan, 2008).

[5]The logic behind digital copies is different. The enormous spread of this practice can be attributed to technical factors that have reduced the costs of copying, including the risk of being caught, to almost zero. Digital copying technologies are very cheap, easy to use and widely available: a large share of the illegal copies are actually made by

presence alters its effects. The analysis of the specific interaction between this illegal market and the design of taxes is the major contribution of the present paper.

Moreover, although the paper does not dwell especially on the question whether the presence of pirates affects the welfare of the consumers and of the regular producers, it must of course touch upon this. For example, a standard argument in defence of illegal markets (normally advanced in the context of digital copies, see again Peitz and Waelbroeck 2003) is that the availability of cheaper alternatives must at the very least be good in terms of increased consumer welfare, so that profit losses from the industry might be partially or totally compensated. However, in the present model it is possible to make a more general argument inasmuch as it considers also whether these markets prevent tax policy from displaying its redistributive effects or actually enhance them. This sort of reasoning is possible because the focus of the analysis has been shifted away from general welfare effects and towards tax issues.

I shall proceed as follows. Section II describes the type of status-seeking behaviour that I have in mind. Section III sets up the model. Section IV analyses the design of optimal policy as well as its effects, and the way in which they are influenced by the existence of fake status goods; it also includes, for completeness, a discussion of the tax policy that might emerge from a political competition process. There is, interestingly, a certain amount of discrepancy between the normative and the positive analysis: the former does not allow to make a strong case for heavy taxation of status goods, but the latter predicts a larger than optimal tax rate. Section V concludes by summarising the main results.

II. Status effects: a defense and a characterisation

It is well-known that economics emphasises status as a motivation of human behaviour less than the other social sciences, despite the fact that one of the early studies on the subject was conducted by an economist (Veblen 1899).[6] Up to 1940s one could find instances of major explanations of economic phenomena by leading researchers that accounted for status concerns, such as the relative income hypothesis (Duesenberry 1949). From the 1950s onward, with the rise of positive economics,

─────────────────────

end-users, and are not sold, but lent for further copying or traded in peer-to-peer networks (Peitz and Waelbroeck 2003). Moreover, there is no or little social disapproval of this habit (see Balestrino 2008 for a theoretical argument and Wang and McClung 2012 for an empirical confirmation).

[6]Today we would regard the work of Veblen more as belonging to the field of economic anthropology. But that might the fruit of a bias on our part, the outcome of a separation between economics and the other social sciences to which we are now used, but that was much less meaningful in Veblen's time.

this has become increasingly rare: a consensus seems to have been reached that assuming an interest in status would clash with the orthodox view of the economic agent as a rational utility maximiser.

Also after Hirsh (1976) re-acquainted forcefully the economists with the subject, and despite the sustained stream of high-brow publications cited in the Introduction, it would still be fair to claim, I believe, that positional concerns have not yet gained (or re-gained) mainstream status in economics. Therefore, I feel obliged to argue in their favour from what I hope is a simple but convincing point of view. I must clarify at the outset that what I wish to make is a rather restricted methodological point. I do not wish to dispute the assumption that the economic agent is a rational maximiser of self-interest with stable preferences,[7] but I wish to point out that there are good reasons to broaden the view of what actually constitutes the self-interest of the individual. In this sense, I propose to see the inclusion of positional concerns into the preferences of economic agents as a challenge for standard economic reasoning only in the positive sense of the word, that is as an incentive to enlarge its reach and scope.

Traditionally, economists have focused on the consumption of marketed goods and services, and have therefore thought of the economic agent as interested in income as a form of entitlement to those commodities. What the proponents of status studies in economics are, implicitly or explicitly, arguing, is that status is a form of entitlement to non-marketable goods and services such as mates, and acts also as a facilitator for market transactions, especially those in which reciprocal trust among the parties is of essence. A frequently invoked argument is that the desire to attain and maintain status is hard-wired in the human brain for evolutionary reasons. Given that status guarantees easier access to goods and services, especially but not exclusively non-marketable ones, it is likely to be crucial to the survival of the individual in times of scarcity (Postlewaite 1998, Frank 2007). Moreover, status search implies imitative behaviour and therefore biases the agent toward following his peers rather than always deciding on his or her own; this limits the recourse to his or her imperfect cognitive skills (Samuelson 2004). Or, even more radically, it might be argued in very general terms that the fact that "the individual is mainly concerned not with his absolute level of success, but rather with the difference between his success and a benchmark that changes over time ... can be evolutionarily advantageous in the sense of improving the individual's ability to propagate his genes" (Rayo and Becker 2007, p. 303). The conclusion is that a concern for

---

[7] I am therefore taking what Bronk (2009, ch. 9) calls a "thick" version of the rationality assumption, i.e. I am not "thinning" the view of the economic agent as a self-interest maximizer by allowing for a wider content of preferences. As many have argued (e.g. Frank 1988, Green and Shapiro 1994 and Bronk 2009) this would make the rationality assumption lose its bite: *ex-post*, everything could be considered "rational".

status must have been naturally selected over the ages: on this basis, it is only natural to include it in a standard preference representation. The strength of the argument lies, it seems to me, in the fact that it plays exactly the chords to which economists are more sensitive: a rational agent who maximises her self-interest *must*, given her very nature, be able to take into account *all* the possible sources of entitlement to utility-yielding goods.

Against this view one could argue that status, being more relevant for non-marketable goods, was much more important in the past, when economies weren't as fully monetised as they are now; so, even granting that the evolutionary argument is right, it must have mostly an historical value, and we are not losing much by assuming it away. In fact, the claim that status has by now lost much of its relevance is not self-evident; but, even if it were correct, it needs not have the consequence that people do not care about status anymore, indeed it *cannot* have it if we follow the evolutionary argument correctly. Postlewaite (1998) notices that hard-wired traits are not necessarily cancelled even if their evolutionary importance has diminished as long as they are not directly harmful in the changed environment, and this is an important part of the reply. But one can go deeper, and remark that the time scale of natural selection is enormous, and a few centuries cannot make any difference. Indeed, most of the living animals we observe today, including us human beings, are "very probably out of date, built under the influences of genes that were selected in some earlier era when conditions were different" (Dawkins, 1982, ch. 3). Time lags are a common feature of evolution by natural selection: for example, "since modern man has drastically changed the environment of many animals and plants over a time-scale that is negligible by ordinary evolutionary standards, we can expect to see anachronistic adaptations rather often. The hedgehog antipredator response of rolling up into a ball is sadly inadequate against motor cars" (*ibid.*). The critique, within the evolutionary logic, has no bite.

In the conventional models in which income is the only source of entitlement, one can study the formation of income. Just as one is interested in the actions taken by the agent to determine her own income, one might be interested in studying how she can manage her status. This paper focuses on the acts by which the agent tries to achieve and maintain a certain status, in particular the use of status-signalling goods. A question that I do not take up is how a good becomes a carrier of status; I simply suppose, as is in fact easy to verify even by casual observation, that in any given time and place there is a subset of marketed goods that play this role, clearly recognised by all members of the society (indeed, if it weren't widely known that a good carries status, it could not, in fact, carry status: the nature of the good is defined in the relationship among the agents, just

as words have a meaning only because we all agree to give it to them).

It must also be said that there are many ways in which an individual may try to establish and maintain his or her status, and there are many fronts on which he or she has to wage the status war: family relations, neighbours, colleagues, fellow commuters, etc. I'll try to circumscribe a variety of status-seeking attitude that seems most relevant to my purposes here. Broadly speaking, one might identify two main warfare typologies, that one may label "strategic" and "atomistic". Strategic status-seeking behaviour occurs when the competitors are few and well-known to each other; atomistic behaviour arises instead when the agent is preoccupied with keeping up his or her status against the public at large.

Of course, the distinction may be exaggerated: most likely, each individual competes simultaneously at both the strategic and the atomistic level, and the same item may serve, at least sometimes, on both fronts. But, analytically, it is easier to understand the implications of policy if we keep the distinction in mind, artificial as it might be. Indeed, it is much easier to define the object of policy for atomistic settings than for strategic ones. For example, in a small town, it may be agreed upon that shopping for clothes at a given store is a sure sign of status. In that case, an important signal will be the shopping bag with the store's name on it, and each lady will be conscious of impressing her hometown rivals by walking around with one of those bags: clearly, a strategic situation, in which there is little scope for policy intervention. On the other hand, there are goods that are widely recognised as carrying status in general situations, such as those identifiable as coming from certain luxury brands. Purchasing in a given store is a specific signal, but wearing Louboutin pumps, easily recognizable by their trademark red soles, or Louis Vuitton bags, with the LV monogram clearly, if tastefully, in sight, is a wide-range signal, aimed at nobody in particular and everybody in general. In those cases, it may be possible for consumers and policy-makers alike to identify a subset of goods – the agreed-upon status-signalling goods – that could in principle require special tax treatment. It is therefore to this sort of atomistic status competition that I turn my attention now.

III. The model

Consider then an economy with a continuum of consumers distinguished by their income y; let $f(y) \geq 0$ be the frequency density function with support $[y^-, y^+]$ and let

$$\int_{y^-}^{y^+} f(y) \, \mathrm{d}y = 1.$$

7

There are two available commodities: a status good a, and a general consumption good c, both normal, and both produced by constant returns to scale competitive industries in which labour is the only input. Production prices are p for the status good and 1 (as a normalization) for the consumption good; the latter is also taken to be untaxed (as an independent normalization), while the former bears a specific tax rate t. The need for status may be satisfied also by purchasing a fake b, produced in an industry with the same characteristics as the one producing the genuine article,[8] and available at some price $q < p$. Further, we will assume that there is some extra-cost attached to the purchase of the fake, be that the bad conscience of doing something illegal, the fear of being exposed wearing a fake, the uncertainty about the quality of the product, or a mix of them. Such a cost might be wholly idiosyncratic, or might depend in some systematic way upon income: for example, high-income agents might fear more than low-income ones the reputational consequences of being caught making an illegal purchase or of being discovered by their relative or friends (their significant others) or they might be more quality-conscious.

Adapting a formulation proposed by Clark and Oswald (1998), I employ the following utility function:

$$U = u\left(\frac{a+b}{r}\right) + v\left(c - bz\left(y\right)\right), \tag{1}$$

where r is the reference level of consumption of the status good, so that $(a + b)/r$ is relative consumption. I suppose that r depends positively on the absolute consumption levels of all agents, but I dot not characterise it further. The crucial assumption motivating the analysis that follow is that, being in an atomistic setting, the agent ignores the impact that his or her own consumption of a or b has on the reference point r. This is the source of the inefficiency-generating "consumption externality", as I will demonstrate later on by comparing the market outcome with the one that would be generated by an omniscient social planner, aware of the economy-wide implications of each agent's choice.[9] On the basis of the argument given in fn. 8, I take a and b to be perfect substitutes,

---

[8] In fact, it might even be the same industry: some "fakes" are actually the real thing without the label or certificate attesting its authenticity. This is possible because fashion brands do not control their production in-house, but hire external factories whose workers can then also produce counterfeited items on the side (Varese 2011). In turn, this implies that the quality of the fake need not be inferior to that of the original, although it might be perceived so, at least when the agent has no means to ascertain this directly.

[9] To be precise, the inefficiency arises when the relative consumption effect is not uniform across goods; indeed, in our case, one of the goods has no relative consumption effect at all. Arrow and Dasgupta (2009) use this property in their discussion of the conditions under which the presence of consumption externalities is compatible with overall efficiency. What evidence we have is however against the uniformity of positional concerns (Solnick and Hemenway

but I also embed the loss inherent to the uncertainty about this, and other cost elements, in a per-unit cost function $z(y)$, expressed in units of the numeraire, independent of the purchased quantity of b and strictly convex in the agent's income. The sub-utility functions $u(\cdot)$ and $v(\cdot)$ are strictly concave and increasing; moreover, the elasticity of the marginal utility of relative consumption $(a+b)/r$ is taken to be larger than unity, which ensures "following behaviour" on the consumer's part, i.e. a desire to acquire more of a or b is r rises – see Clark and Oswald (1998). This is indeed what one would expect for status goods; the utility function however allows also for the "deviant behaviour" of snob agents who prefer less of a good as the reference level increases (when the elasticity of u' is less than unity), although I will not discuss that case here.

Once the budget constraint is defined as

$$(p+t)a + qb + c = y + T, \tag{2}$$

where a lump-sum subsidy $T > 0$ (tax if $T < 0$) has been introduced, one can describe the agent's equilibrium. Solving eq. (2) for c and substituting it in the utility function, one obtains a new objective function, to be maximised by choosing a and b. The FOCs describing the equilibrium are as follows:

$$\frac{1}{r}\frac{u'}{v'} \leq p+t; \quad \frac{1}{r}\frac{u'}{v'} \leq q + z(y), \tag{3}$$

plus complementary slackness. Perfect substitutability implies a corner solution: an agent will purchase no a as long as $p+t$ exceeds $q+z(y)$, and no b in the opposite case. When the "adjusted" price $q + z(y)$ is increasing in y ($z' > 0$), it is easy to identify a threshold income $\overline{y}$, implicitly defined by

$$p+t = q + z(\overline{y}), \tag{4}$$

such that all agents with income above $\overline{y}$ will purchase exclusively a while all agents with income below $\overline{y}$ will purchase exclusively b (the agents whose income is exactly $\overline{y}$ have an indeterminate consumption mix, and one can assign them without loss of generality to either group – say those who purchase a). This is plausible: high income consumers go for the real thing, while the relatively poorer ones buy the fake. The cut-off income depends on policy, because if t increases, there will be more agents who buy b instead of a:

$$\frac{\partial \overline{y}}{\partial t} = -\frac{1}{-z'} > 0, \tag{5}$$

_____

1998, 2005).

where the sign follows from our restriction that $z' > 0$. The lowest cut-off income obtains in *laissez-faire*, when $t = 0$; as taxation is introduced, the threshold will go up.

Turning back to the agent's problem, one finds that the solution yields the demand functions $b(q + z(y); y + T)$, $y < \overline{y}(t)$ and $a(p + t; y + T)$, $y \geq \overline{y}(t)$. Substituting the demands back into the utility function, one obtains the indirect utility functions, in which I emphasize the role of the tax instruments

$$W(T; y), \ y < \overline{y}(t); \ V(t, T; y), \ y \geq \overline{y}(t). \tag{6}$$

It is immediate to see that

$$\frac{\partial W}{\partial T} = v'(c - bz(y)) < 0, \ y < \overline{y}(t); \ \frac{\partial V}{\partial t} = -a < 0; \ \frac{\partial V}{\partial T} = v'(c) < 0, \ y \geq \overline{y}(t), \tag{7}$$

where all the demands are evaluated at the optimum.

Moving now to the case of the omniscient planner, one notices that, knowing that each individual choice affects r, such a planner would solve the maximisation problem differently, and lead the agent to an equilibrium characterised by the following FOCs (to be evaluated at $t = 0$):

$$\frac{1}{r}(1 - \eta(y))\frac{u'}{v'} \leq p; \ \frac{1}{r}(1 - \eta(y))\frac{u'}{v'} \leq q + z(y); \tag{8}$$

again plus complementary slackness. The key elements here is the elasticity of the reference level w.r.t. the individual purchase of the agent,

$$\eta(y) = \frac{a(y) + b(y)}{r}\frac{\partial r}{\partial(a(y) + b(y))}. \tag{9}$$

This elasticity is positive (by the assumption that r is increasing in $a(y) + b(y)$ for all y) and can plausibly be taken to be less then unity for all agents. Hence, the comparison between the planner's FOCs (8) and the ones prevailing in *laissez-faire*, that is eq. (3) evaluated at $t = 0$, shows that in the latter case there is overconsumption of the status good: the marginal benefit curve is shifted to the right relative to the efficient situation.

The threshold income in the planned economy is the same as in the *laissez-faire* one. Also, it is possible to identify the indirect utility functions, and the effects that the policy tools have on them, in the usual way; we use an asterisk to avoid confusion with the market equilibrium case:

$$W^*(T; y), \ y < \overline{y}(t); \ V^*(t, T; y), \ y \geq \overline{y}(t). \tag{10}$$

$$\frac{\partial W^*}{\partial T} = v'(c^* - b^* z(y)) < 0, \ y < \overline{y}(t); \ \frac{\partial V^*}{\partial t} = -a^* < 0, \ \frac{\partial V^*}{\partial T} = v'(c^*) < 0 \ y \geq \overline{y}(t). \tag{11}$$

The discrepancy between the market outcome and the efficient equilibrium establishes an immediate case for policy action in the form e.g. of corrective taxation in the Pigouvian tradition.

But, one might want to consider broader forms of intervention, such as those arising when the government maximises a quasi-concave social welfare function, thereby balancing efficiency and equity objectives. Also, one might like to check the characteristics of the policy arising from a political competition process, e.g. following the standard median voter approach.

IV. Policy analysis

To begin with, let us emphasize again that we are only focusing here on tax policy. The presence of fakes will of course solicit on the government's part some action against those who trade in the shadow market: in principle, the psychic cost of buying a fake, z, may depend on the enforcement of appropriate rules. For the purpose of our analysis here, we consider that sort of intervention as exogenous, although we will comment on the role that the enforcement of rules against illicit trade practices may take in coadiuvating tax policy and *viceversa*; in those instances, we might for example consider the impact of an exogenous change in the value of z.

First, I will consider a purely Pigouvian corrective policy, both in first-best economies in which the government has all the information that it may need, and in second-best ones, where there is not complete information. Next, we study welfarist optimal policies, only in second-best economies. Finally, we consider the political equilibrium policies.

Corrective policy

If the government is simply interested in a Pigouvian corrective policy, then it might think of calibrating t so as to match the value taken by the elasticity of the reference level w.r.t. the individual purchase of a by the agent. Normally, this policy would lead to a complete elimination of the externalities in a first-best setting where the omniscient planner can compute $\eta(y)$ for every y; in a more realistic second-best setting where this is not possible, the policy would remedy the inefficiency only partially. In the present framework, there is the additional difficult that the market in which fakes are traded falls outside the scope of tax policy.

Consider a first-best economy, and suppose that the planner not only knows everything concerning each agent, but can also costlessly eradicate the illegal market (can drive z to such a large value that $\overline{y} = y^-$, hence $b(y) = 0$, $\forall y$). Rewrite the FOC for a in an efficient setting as $u'/v'r \le p/(1 - \eta(y))$; then it easy to see that a first-best corrective tax can be established by solving $p/(1 - \eta(y)) = p + t$ for each agent. This yields

$$\widehat{t}(y) = p\frac{\eta(y)}{(1 - \eta(y))} > 0, \ \forall y \tag{12}$$

11

where the hat denotes the Pigouvian tax, and the tax rate is income-specific (recall that we took η to be positive and less than unity for all agents). By imposing this array of corrective taxes, the government effectively remedies the inefficiency.

Things are however far from being so smooth in second-best. In order to highlight the effects of the market for fakes, let me simplify the task of the government by assuming that $\eta(y)$ is the same across agents, and it is also constant as a changes. Denote this common and fixed value as $\eta \in (0,1)$; the Pigouvian tax is then simply

$$\widehat{t} = p\frac{\eta}{1-\eta} > 0, \ \forall y. \tag{13}$$

But now agents can switch between the legal market and the one for fakes as they like, because in second-best the government cannot costlessly enforce the rules against the latter. Then, if we compare the level of the threshold income $\overline{y}$ after the introduction of the tax with the level prevailing in *laissez-faire*, we find that such a level has gone up as the tax has gone from 0 to some positive value – see eq. (5). Those agents who still purchase a will now behave efficiently, but of course those who purchase b, and there are more of them than before, continue to buy an inefficiently large amount.

On the whole then, corrective tax policy is ineffective as far as efficiency is concerned, unless the government can wipe out the whole black market. This represents an argument for the enforcement of rules against fakes that might be overlooked if tax issues were not considered: such rules might indeed improve the capability of the tax system to remedy the inefficient behaviour of the agents.

Welfarist policy

The government's objective is to maximise a social welfare function, which I take to be a weighted sum of the individual utilities (generalised utilitarianism). Since the government is also aware of the consumption externalities it will however employ as arguments in the social welfare function the "corrected" indirect utilities (10) rather than the ones that actually reflect the agents behaviour.[10] This way, the optimal policy will reflect three concerns: equity, efficiency in the standard sense of limiting the tax distortions and efficiency in the sense of correcting the externality. Social welfare is then given by

$$\int_{y^-}^{\overline{y}(t)} w(y) V^*(T;y) f(y) \, \mathrm{d}y + \int_{\overline{y}(t)}^{y^+} w(y) V^*(t,T;y) f(y) \, \mathrm{d}y, \tag{14}$$

---

[10] A general discussion of taxation when the government has not the same preferences as the agents is to be found in Blomquist and Micheletto (2006).

where $w(y) > 0$ are the welfare weights; to ensure that the government pursues an equity-oriented policy, I assume that $w' < 0$, that is low-income agents have a larger weight. The revenue constraint is

$$t \int_{\overline{y}(t)}^{y^+} a(t, T; y) f(y) \, dy = T, \tag{15}$$

where no exogenous revenue requirement is assumed to exist. The optimal indirect tax system is then simply found by maximising (14) subject to (15).

At the core of this policy problem there is a standard multi-person Ramsey tax problem, with an extra-element to take into account: the number of those who actually purchase the taxed good is endogenous, as it depends on the very tax rate that is to be established. There is also the additional complication that the government wants to employ the tax not only for equity purposes, but also for corrective reasons. The solution procedure is however a simple variant of the standard one, to be found e.g. in Myles (1995). Let me begin by deriving the FOCs w.r.t. to t and to T using (11):

$$\frac{\partial L}{\partial t} \equiv - \int_{\overline{y}(t)}^{y^+} w(y) a^*(y) f(y) \, dy - w(\overline{y}) V^*(\overline{y}) f(\overline{y}) +$$

$$+ \mu \left[t \int_{\overline{y}(t)}^{y^+} \frac{\partial a}{\partial t}(y) f(y) \, dy + \int_{\overline{y}(t)}^{y^+} a(y) f(y) \, dy - ta(\overline{y}) f(\overline{y}) \right] = 0; \tag{16}$$

$$\frac{\partial L}{\partial T} \equiv \int_{y^-}^{\overline{y}(t)} v'(c^*(y) - b^*(y) z(y)) f(y) \, dy + \int_{\overline{y}(t)}^{y^+} v'(c^*(y)) f(y) \, dy -$$

$$- \mu t \int_{\overline{y}(t)}^{y^+} \frac{\partial a}{\partial T}(y) f(y) \, dy = 0, \tag{17}$$

where L denotes the Lagrangian and $\mu > 0$ is the Lagrange multiplier. Now, the required steps are as follows. First, define

$$g(y) = \frac{(\partial L / \partial T)}{\mu} \tag{18}$$

as the social net marginal utility of income (i.e. the marginal utility of income inclusive of its effect on revenue)[11];

$$A = \int_{\overline{y}(t)}^{y^+} a(y) f(y) \, dy \tag{19}$$

as the aggregate/average consumption of a, and

$$G = \int_{\overline{y}(t)}^{y^+} g(y) f(y) \, dy \tag{20}$$

---

[11] The fact that we took the welfare weights to be decreasing in income reinforces the possibility that $g(y)$ is also decreasing in income. The presence of a revenue term in the definition of $g(y)$ makes however impossible to establish this without actually assuming it. Such an assumption is standard in the public finance literature and motivated by the fact that the revenue term includes an income effect that is presumably negligible.

as the social net marginal utility of income aggregated/averaged over those who purchase a; second, add and subtract A to and from the first term in the FOC (16) so as to account for the discrepancy between the actual and the optimal consumption of a; third, apply the Slutsky decomposition to the $\partial a / \partial t$ terms in (16); fourth, substitute the FOC w.r.t. T into the other using (18), and divide throughout by μA. Relative to the standard procedure, the only unusual step is the second; and of course the extra-terms that originate from the derivatives w.r.t. the lower limit of integration in (16), reflecting the endogeneity of the tax basis, must be accounted for. A few final manipulations yield the following generalisation of the many-person Ramsey tax rule:[12]

$$t = -\frac{A\mu\left(1 - rG\right) - \int_{\overline{y}(t)}^{y^+} w\left(y\right) v'\left(y\right) \left[a^*\left(y\right) - a\left(y\right)\right] f\left(y\right) \mathrm{d}y - w\left(\overline{y}\right) V^*\left(\overline{y}\right) f\left(\overline{y}\right)}{\mu\left(\int_{\overline{y}(t)}^{y^+} \frac{\partial a^h}{\partial t}\left(y\right) f\left(y\right) \mathrm{d}y - a\left(\overline{y}\right) f\left(\overline{y}\right)\right)}, \tag{21}$$

where the superscript h denotes the hicksian demand, and $r = cov(g\left(y\right), a\left(y\right)) + 1$ is the so-called redistributive characteristic of a, taking a value greater than unity when consumption decreases with income and less that unity otherwise. Recall that the vector of tax rates is normalised, with the rate on c arbitrarily chosen to be zero. Hence, to say that the tax rate on a is positive or negative really means that the tax rate is larger or smaller than that on c; only statements about relative tax rates make sense. The reader must keep this in mind in order to interpret correctly the analysis that follows.

Notice first that the second term at the denominator represents the reduction of the tax basis due to the very presence of the tax – the amount of consumption of the status goods that goes into the black; the second and third term at the numerator represent instead the impact on the tax design of overconsumption and of the endogenous reduction of the number of tax-payers, respectively. Taking away these three terms, one would recover the standard rule, where the nature of the tax depends exclusively on r, weighed by the average of the marginal utility of income among the tax-payers.

The first term at the denominator of (21) includes the substitution effect of the tax, and thus represents the efficiency concerns relative to the standard distortionary impact of the tax itself; as for the second term, it has been just mentioned that it represents an additional, non-standard, distortionary effect (a tax basis reduction effect). The denominator is certainly negative, since $\partial a^h / \partial t < 0$, while $a\left(\overline{y}\right) f\left(\overline{y}\right) > 0$; also, the larger it is in absolute value, the smaller in absolute value must be t.

Given that the denominator is negative, t has the same sign as the numerator. So, for example,

---

[12] Since there is only one taxed good, the result is expressed directly in terms of the tax rate; with many goods, it should have been framed in terms of effects on the compensated demand for each good.

assume that r is significantly less than unity because the consumption of a, that is after all a luxury good, increases sharply with income;[13] consider that the second term always tends to make the numerator positive because $a^*(y) < a(y)$ for all y; suppose finally that $w(\overline{y}) V^*(\overline{y})$, representing the welfare loss due to the disappearance of a fraction of the indirect tax-payers, is not large enough to compensate the other two elements. Under these conditions, the numerator of (21) is positive, and so is t.

If that is the case, the status good must be taxed more heavily than the general consumption good because it is prevalently consumed by the rich (equity concern, represented by r) and because it is overconsumed by all those who actually purchase it due to the relative consumption effect. The revenue from the taxation of the status good would finance a lump-sum subsidy, $T > 0$. However, there is no presumption that the taxation of the status good must be particularly heavy. In fact, since the denominator includes two distortionary effects (see above), and the third term at the numerator partially compensates the first two, a relatively lenient taxation of the status good might be called for at the optimum.

Summing up, the tax rule for status goods in the presence of counterfeited products must strike a compromise among different concerns. The consumption externality reinforces the tendency to taxation implied by the luxurious nature of the good; the endogenous selection of tax-payers, however, limits the extent to which this taxation may be applied, strengthening the action of the substitution effect. The combined effect is most likely to yield a mildly progressive tax system. The taxation of the luxury goods, that hits exclusively the middle- to high-income agents (those above $\overline{y}$), allows to establish a lump-sum subsidy in favour of all agents; therefore, the middle- to low-income agents (those below $\overline{y}$) obtain resources from the tax system without actually contributing to it. This is the progressive element of the tax system. However, since the presence of the black market makes the tax highly distortionary, its revenue is likely to be small: which is why I spoke of "mild " progressivity.

This result makes it possible to assess whether the markets for counterfeited luxury goods actually play a redistributive role. On the one hand, they make a cheaper alternative to the original articles available, but on the other hand they significantly limit the redistributive role of the tax system. At the theoretical level, it is impossible to ascertain which of the two forces is prevalent in practice, but it cannot be excluded that the second more than compensates the first.

---

[13] The average social net marginal utility of income not likely to affect much the computations, as we assumed that g is decreasing in income (see fn. 11).

It is thus conceivable that the net redistributive effect of the presence of shadow market is negative. By reducing the equity content of the optimal tax structure, it might undo the favourable impact in terms of availability of affordable status-signalling goods.

In this respect, enforcement of the rules against the illegal trade of fake fashion items might in principle help the tax system to become more effective in pursuing its equality objectives. But, while it is clear that a complete eradication of the black market would do the trick, it is less clear how an intermediate step could be helpful. For suppose that the enforcement action lowers the threshold income from. If there are many more agent clustered at the new, lower, income level than at the previous one, and if the reduction of per-capita consumption of a is not particularly large, then aggregate consumption at the threshold income might actually be *larger* after the enforcement effort, and the tax basis reduction effect might actually call for a *lower* tax rate. In turn, this might induce a smaller total revenue – without forgetting the extra-expenditure on enforcement. At this level of generality, it is obviously impossible to reach precise conclusions, but the message is clear: it cannot be known *a priori* whether stepping up the enforcement activities is always a good idea, because the effects at the margin are indeterminate, and there is a non-negligible risk of actually reducing the progressivity of the tax system. The issue should be solved empirically.

Political economy

After investigating the normative side of taxation, it might be of some interest to complete the analysis by taking a positive standpoint. The standard approach would be to invoke the median voter theorem within a Downsian model of political competition where the candidates are office-motivated and can credibly commit to policies before the election; in this case, a simple majority voting procedure is enough to guarantee the existence of an equilibrium. It is however necessary to verify if the conditions for its applicability hold.

As a preliminary remark, let me emphasize that the policy that emerges at the political equilibrium ignores the externality issues, and only concentrates on the black market ones. Of the two main peculiarities of status goods that we identified at the beginning of the paper, and that affected together the normative results, only one remains relevant in the positive setting. In the voting process, the agent do not take into account the need to correct for the overconsumption of the status good, that is after all something they do not perceive as a problem by assumption; they still act on the basis of their own limited point of view, not that of the omniscient planner. From that limited point of view, only the change in the tax basis due to the tax rate affects the agent's

calculations.

For the purpose of this subsection, it is convenient to further simplify the framework by taking the utility function to be quasilinear in the standard consumption good c. The main consequence of this is that the marginal utility of income is constant and normalised to unity; all our result are readily generalizable to a standard decreasing marginal utility, but the intuition behind them is much better conveyed in the simplified setting.

Let us then derive the policy preferences of the agents: using (7), but recalling that $V_T = W_T = 1$ due to quasi-linearity, we find that the marginal rate of substitution between policy tools is

$$-\frac{W_t}{W_T} = 0, \ y < \overline{y}(t); \ -\frac{V_t}{V_T} = a, \ y \geq \overline{y}(t), \tag{22}$$

where the first result follows because those who purchase the status good on the black market pay no indirect tax, and therefore there is no substitutability between the policy instruments. For the median-voter equilibrium to exist with certainty, it must be the case that this marginal rate of substitution is monotonic in type, i.e. income.[14] Then,

$$\frac{\partial(-V_t/V_T)}{\partial y} = \frac{\partial a}{\partial y} > 0, \ y \geq \overline{y}(t). \tag{23}$$

where the sign follows from normality of a. For all agents with income below $\overline{y}$, the marginal rate of substitution is of course constant: they all agree, as we shall see, on the same preferred policy. The conditions for the median-voter theorem to hold are thus satisfied.

The next step is to emphasise that from the government budget constraint we can express T as a function of t,

$$T(t) = t \int_{\overline{y}(t)}^{y^+} a(t, T; y) f(y) \, \mathrm{d}y. \tag{24}$$

For future use, we need to compute

$$T' = \int_{\overline{y}(t)}^{y^+} a(t, T; y) f(y) \, \mathrm{d}y + t \left(\int_{\overline{y}(t)}^{y^+} \frac{\partial a}{\partial t}(t, T; y) f(y) \, \mathrm{d}y - a(\overline{y}) f(\overline{y}) \right) \equiv A + t \frac{\partial A}{\partial t}, \tag{25}$$

where the identity follows from (19); recall that $\partial A/\partial t$, representing the total distortionary effect of the tax, is negative. Normally, the revenue curve in the (t, T)-space is assumed to be strictly concave – a standard Laffer-type curve. In the present setting, $T' > (=, <)\, 0$ obtains if

$$\left| \frac{t}{A} \frac{\partial A}{\partial t} \right| < (=, >)\, 1, \tag{26}$$

---

[14]The monotonicity of the marginal rate of substitution between policy tools is equivalent to the so-called "single-crossing" of the indifference curves in the policy space. Gans and Smart (1996) have proven that single-crossing ensures the existence of the median-voter equilibrium.

where the term on the l.h.s. is the absolute value of a generalised revenue elasticity that accounts also for the change in the tax base. The sign of T'' depends on the second derivatives of the demand function, and therefore, at this level of generality, must be *assumed* to be negative so as to guarantee strict concavity.

By substituting the expression for $T(t)$ into the indirect utility functions (6) and taking the derivative w.r.t. t, it is possible to identify the ideal tax rate $t(y)$. This solves

$$W_t(y) = T' = 0, \ y < \overline{y}(t); \ V_t(y) = -a + T' = 0, \ y \geq \overline{y}(t). \tag{27}$$

Hence, we have

$$t(y) = -\frac{A}{\partial A/\partial t}, \ y < \overline{y}(t); \tag{28}$$

$$t(y) = \frac{a(y) - A}{\partial A/\partial t}, \ y \geq \overline{y}(t). \tag{29}$$

The interpretation is very simple. All those who purchase the status good on the black market agree on the same preferred tax rate, that must be positive and indeed as large as possible, i.e. set at the level where revenue is maximised ($T' = 0$). This way, they will enjoy the largest possible amount of redistribution in their favour: they do not pay any indirect tax, but receive the maximum poll-subsidy. The tax preferences of those who purchase the status good on the legal market depend on how much they consume. Those who consume more than the average ($a(y) > A$) favour a subsidy ($t < 0$), those who consume less than the average ($a(y) < A$) favour a tax ($t > 0$). This is a standard result in political economy models, although here it is slightly modified because it doesn't apply to the whole population, but only to those who make legal purchases.[15]

The winning policy is determined by where the median income lies on the income distribution. The standard assumption is, as virtually true everywhere, that the median income is less than the average income. In our case, this has different implications depending on whether the median income earner makes his or her purchases of the status good on the black market or on the legal market. In the first case, the winning policy implies a revenue-maximising t. In the second case, the most likely outcome is that this agent is one of those who purchase less than A: since the group of those who buy a is made by relatively high earners, the average quantity of a consumed is probably more than the quantity consumed by the agent with mean income, and therefore also more than the quantity consumed by the median income agent.

---

[15] Alternatively, we may say that it applies to the whole population with the *proviso* that all agents with income less than $\overline{y}$ are bunched at the same preferred policy. In fact, the ideal t for them can be derived by setting $a(y) = 0$ in (29).

Thus, we may generally expect that the status good will be taxed at the political equilibrium. If the black market is particularly well developed, and a large fraction of the population make their purchases there, then the implemented tax rate might even be the one that maximises revenue. There will therefore be a certain amount of redistribution, and this vindicates somehow the claim that illegal markets of the sort described here can favour the less well-off. Since this is especially true when the black market is large, the argument also establishes a case against the active enforcement of the rules on a political economy basis, and is consistent with the observation that the general public seems uninterested, if not actively contrary, to the eradication of black markets for counterfeited status goods. In any event, it must be remembered, that if the tax rate is highly distortionary, be that because the substitution effect is large or because the tax base loss is significant or both, then the revenue-maximising t is not necessarily very large.

The interesting question is however whether the tax rate emerging at the political equilibrium is above its efficient level – efficient in the sense that would be chosen by an utilitarian planner, taking into account also the consumption externality. Such a tax rate can be derived from the formulation (21), obtained in the previous subsection, by simply setting the weights $w(y) = 1$ for all y. At first sight, a comparison between the efficient tax rate as given by (21) thus modified, and the political equilibrium tax rate is difficult. For the case in which the median voter is among those who purchase on the black market, it is however possible to conclude that the latter exceeds the former. The welfare-maximising tax rate can, as is well-known, also be found via a dual problem: maximising revenue subject to a given social welfare level. This compares to the unconstrained optimisation that constitutes the median voter problem as a constrained optimisation with the same maximand. The tax rate that solves the constrained problem must therefore be smaller than the one that solves the free problem, as long as the constraint bites (and the optimum is on the upward-sloping part of the Laffer curve). Then, the winning tax rate is inefficiently large.

V. Concluding remarks

Previous results on fiscal policy in the presence of status-carrying goods agree on the conclusion that, from the point of view of social welfare maximisation, there is no strong case for taxing them particularly heavily (Corneo and Jeanne 1996, Micheletto 2009). The present contribution expands on those works in that it considers explicitly the possibility that the status-signalling goods may be purchased on illegal markets; it thus recognises the enormous importance of fakes in this context, emphasising that it is the very nature of status goods that incentivates the formation of

the illegal markets. In fact, since these goods have only or mostly a signalling value, they can be easily counterfeited by making objects that have a similar appearance. This paper also considers a wider array of policy situations than previous works: not only the design of indirect redistributive taxation, but also that of corrective taxation, and the formation of equilibrium indirect tax policies via a political process.

The analysis confirms that the case for heavy taxation of status goods is not particularly compelling in a social welfare maximisation context, by offering further arguments against it. On the one hand, it is true that the overconsumption typically associated with the status-signalling nature of the goods in question calls for a high tax rate; but on the other hand, it must be recognised that such a tax rate is strongly distortionary, not only in standard substitution terms effects, but also, as it is highlighted in the present formulation, because it favours the enlargement of the black market and a consequent loss of tax basis. The optimal tax rate resulting from these competing claims needs not be particularly large. In turn, this makes it difficult to give to the tax system a strongly progressive shape; doubts are therefore cast on the usual statement that the presence of fakes acts as a redistributive instrument by making cheap alternatives available. It is true that low earners can in this case afford status goods that would have been otherwise unreachable, but it is also true that the illegal market hampers the equity-enhancing action of the tax system.

Also, the analysis breaks new ground by noticing that corrective taxation, aimed at remedying the inefficiencies associated with the consumption externalities generated by the status goods, is made by and large ineffective by the presence of a market for fakes. The corrective tax induces those who stay legal to consume efficiently, but increases the number of those who go black, who continue to overconsume.

Finally, political processes are studied in the context of a simple median voter model. It is found that this model predicts a relatively heavy tax rate on status goods, especially in the presence of a large illegal markets. If the median voter makes her purchases illegally, she is not hit by the tax on the legally traded status-goods but at the same time enjoys the fruits of its revenue; she will therefore favour a revenue-maximising tax rate, that can be shown to be inefficiently large. This result goes some way towards explaining why in the history of the fiscal systems heavy indirect tax rates on luxury goods are often encountered, despite the fact that they are, normatively speaking, inadvisable. The contrast between the social welfare analysis and the political economy analysis is of some interest.

Finally, a few comments are offered, throughout the analysis, on the opportunity of enforcing

policy actions against the illegal market. It is noted that, while a complete eradication would be useful as far as welfare-maximising tax policy is concerned, a partial elimination would not necessarily help. From a positive standpoint, it is unlikely that these actions receive a significant support, because the tax structure favoured by the median voter relies exactly on the presence of the black market.

References

Allingham, M. and Sandmo, A., 1972, "Income tax evasion: a theoretical analysis", *Journal of Public Economics* 1, 323-338.

Arrow, K. and Dasgupta, P., 2009, "Conspicuous consumption, inconspicuous leisure," *Economic Journal* 119, F497-F516.

Bagwell, L. and Bernheim, B., 1996, "Veblen effects in a theory of conspicuous consumption", *American Economic Review* 86, 349-373.

Balestrino A., 2008, "It is a theft but not a crime", *European Journal of Political Economy* 24, 455-469.

Balestrino, A., 2009, "Tax avoidance, endogenous social norms, and the comparison income effect", ChilD WP no. 15/2009.

Bernheim, B., 1994, "A theory of conformity", *Journal of Political Economy* 102, 841-877.

Blomquist, S. and Micheletto, L., 2006, "Optimal redistributive taxation when government's and agents' preferences differ", *Journal of Public Economics,* 90, 1215-1233.

Boskin, M. and Sheshinski, E., 1978, "Optimal redistributive taxation when individual welfare depends upon relative income", *Quarterly Journal of Economics* 92, 589-601.

Bratigan, T., 2008, "Chinese figures show fivefold rise in babies sick from contaminated milk", *www.guardian.co.uk* (available at http://www.guardian.co.uk/world/2008/dec/02/china).

Bronk, R., 2009, *The Romantic Economist*, Cambridge University Press, Cambridge (UK).

Clark, A. and Oswald, A., 1998, "Comparison-concave utility and following behaviour in social and economic theory", *Journal of Public Economics* 70, 133-155

Corneo, G., 2002, "The efficient side of progressive income taxation", *European Economic Review* 46, 1359-1368.

Corneo, G. and Gruner, H., 2000, "Social limits to redistribution", *American Economic Review* 90, 1491-1507.

Corneo, G. and Jeanne, O., 1997, "Conspicuous consumption, snobbism and conformism", *Journal*

of Public Economics 66, 55-71.

Duesenberry, J., 1949, *Income, Saving and the Theory of Consumer Behaviour*, Harvard University Press, Cambridge (MA).

Dawkins, R., 1982, *The Extended Phenotype*, Oxford University Press, Oxford (UK).

Dupor, B. and Lu, W.-F., 2003, "Jealousy and equilibrium overconsumption", *American Economic Review* 93, 423-428.

El Harbi, S. and Grolleau, G., 2008, "Profiting from being pirated by 'pirating' the pirates", *Kyklos* 61, 385-390.

Ferrer-i-Carbonell, A., 2005, "Income and well-being: an empirical analysis of the comparison income effect", *Journal of Public Economics* 89, 997-1019.

Frank, R., 1984, "Are workers paid their marginal products?", *American Economic Review* 74, 549-571.

Frank, R. 1988, *Passions within Reason: The Strategic Role of the Emotions*, Norton, New York (NY).

Frank, R., 2007, *Falling Behind: How Income Inequality Harms the Middle Class*, University of California Press, Berkeley (CA).

Gans, J. and Smart, M. 1996, "Majority voting with single-crossing preferences", *Journal of Public Economics* 59, 219-37.

Glazer, A., Konrad, K., 1991, "A signaling explanation for charity", *American Economic Review* 86, 1019-1028.

Goerke, L., 2011, "Relative consumption and tax evasion", unpublished, Eberhard Karls Universität, Tübingen (GE).

Green, D. and Shapiro, I., 1994, *Pathologies of Rational Choice Theory: A Critique of Applications to Political Sciences*, Yale University Press, New Haven (CT).

Hirsh, F., 1976, *The Social Limits to Growth*, Routledge & Kegan Paul, London (UK).

Ireland, N., 1994, "On limiting the market for status signal", *Journal of Public Economics* 53, 91-110.

Ireland, N., 2001, "Optimal tax in the presence of status effect", *Journal of Public Economics* 81, 193-212.

Konrad, K. and Lommerud, K.-E, 1993, "Relative standing comparisons, risk taking and safety regulations", *Journal of Public Economics* 51, 345–358.

Micheletto, L., 2008, "Redistribution and optimal mixed taxation in the presence of consumption

externalities", *Journal of Public Economics* 92, 2262–2274.

Micheletto, L., 2009, "Optimal nonlinear redistributive taxation and public good provision in an economy with Veblen effects", Working Paper 2009:3, Department of Economics, Uppsala University, Sweden.

Myles, G. 1995, *Public Economics*, Cambridge University Press, Cambridge (UK).

Peitz, M. and Waelbroeck, P., 2003, "Piracy of digital products: a critical review of the economics literature", CESifo WP no. 1071, Munich (GE).

Penelope, N., 2011, *Soldi Rubati*, Ponte alle Grazie - Salani, Milan (IT).

Postlewaite, A., 1998, "The social basis of interdependent preferences", *European Economic Review* 42, 779-800.

Rayo, L. and Becker, G., 2007, "Evolutionary efficiency and happiness", *Journal of Political Economy* 115, 302–337.

Samuelson, L., 2004, "Information-based relative consumption effects", *Econometrica* 72, 93–118.

Sandmo, A., 1990, "Tax distortions and household production", *Oxford Economic Papers* 42, 78-90.

Solnick, S. and Hemenway, D. 1998, "Is more always better? A survey about positional concerns", *Journal of Economic Behavior and Organization* 37, 373-83.

Solnick, S. and Hemenway, D., 2005, "Are positional concerns stronger in some domains than in others?", *American Economic Review* 95, 147-151.

Truyts, T, 2008, "Social status in economic theory: a review", CES DPS 08.21, Katholieke Universiteit Leuven, Belgium.

Varese, F., 2011, *Mafias on the Move*, Princeton University Press, Princeton (NJ).

Veblen, T., 1899, *The Theory of the Leisure Class*, MacMillan, New York (NY).

Wand, X. and McClung, S., 2012, "The immorality of illegal downloading: The role of anticipated guilt and general emotions", *Computers in Human Behavior* 28, 153–159.