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BLING BLING TAXATION AND THE FISCAL VIRTUES OF HIP HOP

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Bling Bling Taxation and the Fiscal Virtues of Hip Hop*

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Abstract

The paper extends Ng's (1987) model of optimal taxation of *diamond goods* – goods that are valued solely for their costliness. We extend his findings by analyzing how other goods should be taxed in the presence of pure diamond goods; modified Ramsey rules are derived in a basic single-type model as well as in a two-type model with redistribution. One key finding, that may be surprising and rather provoking, is that close complements (hip hop music) to diamond goods (bling bling) should be heavily subsidized.

1 Introduction

The proponents of luxury taxes have been many throughout history. But few have been as eloquent on the matter as John Stuart Mill himself:

“[Luxury taxes] have some properties which strongly recommend them. [...] I disclaim all asceticism, and by no means wish to see discouraged, either by law or opinion, any indulgence[...] which is sought from a genuine inclination for, and enjoyment of, the thing itself; but a great portion of the

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expense of the higher and middle classes in most countries [...] is not incurred by the sake of the pleasure afforded by the things on which money is spent, but from regard to opinion, and an idea that certain expenses are expected from them, as an appendage of station; and I cannot but think that expenditure of this sort is a most desirable subject of taxation. If taxation discourage it, some good is done, and if not, no harm; for in so far as taxes are levied on things which are desired and possessed for motives of this description, nobody is the worse for them. When a thing is bought not for its use but for its costliness, cheapness is no recommendation. As Sismondi remarks, the consequence of cheapening articles of vanity, is not that less is expended on such things, but that the buyers substitute for the cheapened article some other which is more costly, or a more elaborate quality of the same thing; and as the inferior quality answered the purpose of vanity equally well when it was equally expensive, a tax on the article is really paid by nobody: it is a creation of public revenue by which nobody loses.” (Mill, 1848)

Given that these words were expressed by one of the greatest economist throughout history there is surprisingly little formal attention on the matter in mainstream economics today. It was not until 1987 that mainstream economics produced a formal treatment of the mechanism that Mill pinpoints. This was done in the very elegant article, *Diamonds are a government’s best friend* by Ng in the *American Economic Review* (Ng, 1987). Before this there were hardly any treatments of luxury taxes in the Public Finance literature at all.

A brief intuitive summary of Ng’s model goes like this. Define a *diamond good* as a good that has no value apart from its costliness – natural diamonds are indistinguishable from the, much cheaper, artificial diamonds to almost everyone.¹ The opposite, which could be labeled *diaper goods*, are all prosaic goods that are valued purely for their practical purpose.² When the price of a diamond good increases (through taxation or any other source) the value of

¹Diamond goods are closely related to Veblen goods (Veblen, 1889). However, in Veblen’s notion it would be principally wrong to model utility as directly dependent on price; the agent should care about status and consumption. See Bagwell and Bernheim (1996) for a model based on signaling in which Veblen effects arise endogenously. See also Ng (1987) for a discussion regarding the differences between Veblen goods and diamond goods.

²Introspection suggests that most goods are somewhere in between diaper goods and diamond goods. It is actually hard to come up with an example of a pure diaper good. Even diapers carry some diamond like quality in the modern society. Thanks to clever advertising and marketing of different brands there are indeed status considerations related even to the choice of diapers.

the diamond good will increase with the same proportion (keeping the price of all other goods constant). It is straightforward to show that the money spent on the diamond good will be independent of its price. Furthermore, the indirect utility will in fact be independent of its price. It then follows that, by the same logic described in Mill's quote, diamond goods are perfect for taxation: the government may actually tax, not only without excess burden, but without burden at all. Technically, the optimal tax on the diamond good will approach infinity in the simplest model with a pure diamond good. The model abstracts from important aspects such as, black market trade and intertemporal effects, which would certainly put a bound on the diamond tax in reality.

Later extensions of Ng (1987) have focused on non-pure diamond goods (see e.g. Ng, 1993, and Deng and Ng, 2004). In this short paper we will extend this model in another direction. We will restrict the analysis to pure diamond goods, but generalize by focusing on the taxation of non-diamond goods in the presence of a diamond good. We put specific emphasis on taxation of close complements to diamond goods. The logic is isolated in an extreme example of bling bling (diamond good) and its close complementarity with hip hop music (non-diamond good). Our analysis shows that the social planner has incentives to put heavy subsidies on hip hop in order to encourage consumption of bling bling.

2 The model and general results

2.1 The model

Consider a static economy with a large number (normalized to one) of identical individuals and a benevolent social planner. The representative individual derives utility from n consumption goods $[x_1, x_2 \dots x_n]$ and disutility from labor input l . There is perfect competition and constant returns to scale in all markets, so producer prices are given exogenously by \mathbf{p} and the wage w . Let the consumer goods prices be given by $\mathbf{q} = \mathbf{p} + \mathbf{t}$ and let the wage be numeraire and untaxed by normalization. In addition, the social planner may levy a lump sum tax or transfer given by T .

Let good 1 represent a pure diamond good, i.e. a good which derives value only from its costliness. All other goods are free from diamond effects. The twice differentiable and quasi concave utility function is given by $U =$

$U(\frac{x_1 q_1}{w}, x_2, \dots, x_n, l) = U(x_1 q_1, x_2, \dots, x_n, l)$, where $U_{x_i} > 0$ and $U_l < 0$ hold. Dividing the term $x_1 q_1$ by the numeraire makes the problem homogenous of degree zero in all nominal variables.³

It is straightforward to confirm that the individual maximization problem is technically identical to maximizing $U = U(\alpha, x_2, \dots, x_n, l)$ where α can be bought at price $w = 1$. From this it directly follows that the individual demand for good x_1 is given by $x_1 q_1 = \alpha(q_2 \dots q_n, T)$.⁴ This means that the resources spent on the diamond good ($\alpha(q_2 \dots q_n, T)$) are unaffected by the tax on the diamond good, which, in turn, implies that the indirect utility is unaffected by the tax on the diamond good, which is the formal representation of Mill's conclusion.

Taxing a pure diamond good is thus a free lunch, a tax that carries no burden. When seen from the production side of the economy the efficiency gain from raising the tax on the diamond good is that less resources need to be spent on producing it. In the limit when the diamond good tax approaches infinity, only an infinitesimal amount needs to be produced. As long as the social planner values revenue, the tax on the pure diamond good should approach infinity ($t_1 \rightarrow \infty$) and the revenues derived from the diamond good market approach its supremum, $\alpha(q_2 \dots q_n, T)$. When finding the optimal tax regime we will for simplicity take these properties as given, since they are not new to the literature.⁵

The Ramsey problem facing the social planner is thus

$$\max_{t_2, t_3 \dots t_n, T} V(q_2, q_3 \dots q_n, T) \quad (1)$$

$$s.t. T = \alpha + \sum_{i=2}^n t_i x_i, \quad (2)$$

³Ng's use of the numeraire, instead of a more comprehensive price index, to divide the term $x_1 q_1$ was criticized by Friedman (1988). The difference lies in that a price index is endogenous to the diamond tax, which would make the derivations less tractable. However, Ng (1989) argues that the reason for taxing diamonds heavily would still be there as long as an increase in the diamond tax increases the price of diamonds relative to the price index. The effect disappears only in the highly unrealistic case when the price index is proportional to the diamond price. Intuitively speaking, the smaller the diamond good's budget share is, the more harmless assumption it is not to include the diamond price in the price index.

⁴For a more technical derivation of this solution, see Ng (1987).

⁵Formal derivations are available on request or found in Ng (1987).

where $V(\cdot)$ is the indirect utility function while α and x_i ($i \in (2, n)$) now represent Marshallian demand functions derived from the individual maximization problem.

2.2 Solution

The first order conditions to the social planner's problem are

$$q_k : -\frac{\partial V}{\partial T} x_k + \gamma \left(\frac{\partial \alpha}{\partial q_k} + x_k + \sum_{i=2}^n t_i \frac{\partial x_i}{\partial q_k} \right) = 0, \text{ for all } k = 2, n, \quad (3)$$

$$T : \frac{\partial V}{\partial T} + \gamma \left(-1 + \frac{\partial \alpha}{\partial T} + \sum_{i=2}^n t_i \frac{\partial x_i}{\partial T} \right) = 0, \quad (4)$$

where Roy's identity has been used in (3). γ is the shadow price of public revenue.

Combining (3) and (4) and using the Slutsky equation gives

$$\frac{\partial \alpha^h}{\partial q_k} + \sum_{i=2}^n t_i \frac{\partial x_i^h}{\partial q_k} = 0 \quad (5)$$

where the top-index h indicates a compensated demand function. Eq. (5) is a modified Ramsey rule. Intuitively, it says that the indirect marginal fiscal effects of the tax system should be zero for an optimal tax system.⁶ In the case when there is no diamond good present ($\alpha \equiv 0$) we see from inspection of Eq. (5) and the social planner's budget restriction (2) that $T = t_i = 0$ ($\forall i$) solves the problem, which is simply a confirmation of the first welfare

⁶When expressing the social planner's budget restriction in terms of Hicksian demand functions we get:

$$T = \alpha^h + \sum_{i=2}^n t_i x_i^h.$$

Taking the derivative of T with respect to t_k then gives

$$\frac{\partial T}{\partial t_k} = \underbrace{x_k^h}_{\text{direct}} + \underbrace{\frac{\partial \alpha^h}{\partial q_k} + \sum_{i=2}^n t_i \frac{\partial x_i^h}{\partial q_k}}_{\text{indirect}}.$$

From this perspective the classic Ramsey (1927) rule implies that the marginal indirect fiscal effects, relative the direct effects, should be equal between taxes.

theorem. But in the presence of a diamond good, the optimal solution needs not be zero taxes (apart from $t_1 \rightarrow \infty$) anymore. Now the effects of taxes on the size of the free lunch ($\alpha(\cdot)$) must be taken into account.

When disregarding all cross-price effects among the ordinary goods ($i \geq 2$), Eq. (5) takes a particularly simple form. Let $\frac{\partial x_i^h}{\partial q_k} = 0$ for ($i \neq k$) and Eq. (5) reduces to the simple optimal tax formula,

$$t_k = -\frac{\frac{\partial \alpha^h}{\partial q_k}}{\frac{\partial x_k^h}{\partial q_k}}. \quad (6)$$

Now, if good k is a complement (substitute) to the diamond good $\frac{\partial \alpha^h}{\partial q_k} < 0$ ($\frac{\partial \alpha^h}{\partial q_k} > 0$) holds. Eq. (6) then implies that complements (substitutes) to the diamond good should be subsidized (taxed). However, when the cross-price effects are present this simple logic may not prevail.

It is hard to come up with simple examples of ordinary goods that are close substitutes to diamond goods while still not diamond goods themselves; the obvious examples of diamond substitutes, such as gold and jewels are indeed diamond goods as well. But as will be discussed in section 3 below it is not hard to characterize a large number of close complements to diamond goods.

2.3 Generality and extension

The problem is not in perfect analogy with Ramsey taxation. One weakness of the Ramsey (1927) setup is that the need for using commodity taxes is artificial – one has to assume that a lump-sum tax may not be levied (which otherwise would be the natural way to derive revenues in a one-type economy). The Ramsey setup is thus not interesting unless you exclude the first-best choice of taxation, which puts serious limitations to the generality and practical importance of the Ramsey rule. In our case the problem is interesting (and also more tractable) even when we allow for lump sum taxes or transfers. This makes the results we derive much more general.

However, one may still argue that the model is too restrictive since there is no scope for redistribution. Ever since the seminal continuous wage-type model (Mirrlees, 1971) and its more tractable two-type cousin (Stiglitz, 1982) the Public Finance literature has produced a vast number of models in which a social planner engages in redistributive taxation while lacking information

of the individuals' market wages. This, however short, paper would therefore not be complete without extending the analysis to heterogenous agents. We extend the model to a two-type optimal commodity and income taxation setting, along the lines of Edwards, Keen and Tuomala (1994). We restrict the analysis to the case where the two types share the same weakly separable (in consumption and leisure) utility function. This means that the famous Atkinson and Stiglitz (1976) result applies; there is no redistributive scope for commodity taxes in a corresponding model without diamond goods. The question we ask is whether the results from the basic setup above will prevail in such an extended setting.

Let the economy consist of a share θ^L low-wage individuals and a share θ^H high-wage individuals, i.e. $\theta^L + \theta^H = 1$. Wages are exogenously given so that $w^H > w^L$ holds. We make the standard assumption that only the self selection constraint facing the high-wage group (potentially) binds. The social planner's maximization problem may then be written:⁷

$$\begin{aligned} \max_{t_2, t_3, \dots, t_n, B^L, B^H, Y^L, Y^H} \quad & V^H(q_2, q_3, \dots, q_n, B^H, Y^H) \\ & \text{s.t.} \\ & V^L(q_2, q_3, \dots, q_n, B^L, Y^L) = \bar{V}^L \\ & V^H(q_2, q_3, \dots, q_n, B^H, Y^H) \geq V^m(.) \\ \sum_j \sum_{i=2}^n \theta^j (q_i - p_i) x_i^j + \sum_j \theta^j (Y^j - B^j) + \sum_j \theta^j \alpha^j & = 0, \end{aligned}$$

where B^j and Y^j refers to net and gross income, respectively, for type j ($j = L, H$), \bar{V}^L is the exogenous utility constraint for the low-wage type and $V^m(.) = V^H(q_2, q_3, \dots, q_n, B^L, Y^L)$ is the utility of a high-wage type who mimics the low-wage type.

In the Lagrange function the non-negative multipliers δ , λ and γ respectively refers to the utility constraint, the self selection constraint and the

⁷Note that the underlying assumption is that the utility function for individual j is $U = U(\frac{x_1^j q_1}{f(w^L, w^H)}, x_2^j, \dots, x_n^j, l^j) = U(x_1^j q_1, x_2^j, \dots, x_n^j, l^j)$, where $f(w^L, w^H)$ is a general wage index used as the numeraire in this extended model.

public budget constraint. The first order conditions for B^L , B^H and t_k are⁸

$$B^L : \delta V_B^L - \lambda V_B^m + \gamma \left[\sum_{i=2}^n \theta^L (q_i - p_i) \frac{\partial x_i^L}{\partial B^L} - \theta^L + \theta^L \frac{\partial \alpha^L}{\partial B^L} \right] = 0, \quad (7)$$

$$B^H : (1 + \lambda) V_B^H + \gamma \left[\sum_{i=2}^n \theta^H (q_i - p_i) \frac{\partial x_i^H}{\partial B^H} - \theta^H + \theta^H \frac{\partial \alpha^H}{\partial B^H} \right] = 0, \quad (8)$$

and

$$t_k : V_{q_k}^H + \delta V_{q_k}^L + \lambda(V_{q_k}^H - V_{q_k}^m) + \gamma \left(\sum_j \theta^j x_k^j + \sum_j \sum_{i=2}^n \theta^j t_i \frac{\partial x_i^j}{\partial q_k} + \sum_j \theta^j \frac{\partial \alpha^j}{\partial q_k} \right) = 0, \quad (9)$$

It is straightforward⁹ to combine these three conditions (7 to 9) to obtain the optimal tax formula

$$\sum_j \theta^j \frac{\partial \alpha^{hj}}{\partial q_k} + \sum_j \sum_{i=2}^n \theta^j t_i \frac{\partial x_i^{hj}}{\partial q_k} = 0. \quad (10)$$

This two-type modified Ramsey rule corresponds perfectly with the one-type solution (5). Thus, in a two-type economy, it is simply the weighted average responses to the taxes that matter for optimality as long as the commodity taxes have no redistributive purpose.

3 Bling Bling and Hip Hop

In the modern society diamond goods often come with complements; these could be in the form of other goods, as lifestyles or as marketing and prestige building product placements. For instance, James Bond movies may increase

⁸We do not report the first order conditions for Y^j since they are not required to derive the optimal commodity tax formula.

⁹There are a number of straightforward but quite tedious steps involved: i) use Roy's identity to replace $V_{q_k}^L$, $V_{q_k}^H$ and $V_{q_k}^m$ in (9); ii) use the fact that weak separability between leisure and consumption implies that the consumption basket of the mimicker and the low-income type are identical, i.e. $x_i^m = x_i^L$ ($\forall i$); iii) Use the Slutsky equation in (9) to replace the Marshallian demands with Hicksian (top index h) and income effects; iv) multiply (7) and (8) with x_k^L and x_k^H respectively; v) finally add up all three modified equations to arrive at (10).

the demand for expensive champagne, which is indeed a diamond good, and the HBO series *Sex and the City* may encourage demand for fancy women's shoes (also diamond goods). It is actually hard to find diamond goods that are not fuelled by other related goods or activities. Perhaps the most striking link between a pure diamond good and a certain lifestyle is the very intimate relation between bling bling¹⁰ and the hip hop scene. Bling bling, in its extreme form, probably has a negative user value for most people. But for people attached to the hip hop scene it is a whole different story; encrusting your cell-phone with jewels may not be the optimal choice for the average economics professor, but for a wannabe rapper it may be the perfect way to signal success.

This means that hip hop and bling bling are indeed very close complements. We will take this assumption to its most extreme form and model the good hip hop music (h) as a perfect complement to the pure diamond good bling bling (b). For simplicity we restrict this example to the basic one-type economy. The utility function is thus $U = U(\min(bq_b, h), x_2 \dots x_n, l)$. We also assume that none of the other goods are related to bling bling ($\frac{\partial \alpha}{\partial q_i} = 0$ for $i \geq 2$), which in turn means that all cross-price effects of q_h automatically disappear. As long as the consumer price of hip hop music is positive, it will hold that $\alpha = h$.

Using Eq. (6) we see that the optimal tax on hip hop music should be $t_h = -1$ while the tax on all normal goods will be zero. Hip hop music should thus be subsidized by the full price of the numeraire good (this is of course only possible when $p_h \geq w \equiv 1$, since prices cannot be negative for practical reasons). The intuition behind this result can be seen from noting that the individual's optimization problem is technically the same as if she viewed α as a good bought at price $w = 1$ (as described above). Note further that we may think of this good as being bought directly from the social planner who carries zero production cost. Since the tax on the pure diamond good approaches infinity, all resources spent on the diamond good (α) go directly into the social planner's budget, as seen from the budget constraint (2). If the production cost of a good is zero, a benevolent social planner would set its price to zero. Alas, the social planner cannot set the price of α . But when

¹⁰Bling bling refers to the very extreme kind of ornamentation that hip hop artists often display. It could consist of very heavy gold chains with massive dollar signs (euro signs have lately come in fashion since the late fall in dollar price), diamond encrusted ipods, or surgically removing all your teeth and replacing them with asymmetric chunks of diamond adorned gold.

α has a perfect complement (h), we can think of (α, h) as a composite good. The social planner may then subsidize the complement (h) by the full price of α and thereby effectively setting the price of α to its zero production cost, which in turn makes the consumer price of the composite good (α, h) equal to its socially efficient price p_h .

A related result from this extreme example is that the lump sum tax/transfer will not be used under the optimal tax regime. From the government's budget restriction (2) we get

$$T = \alpha + ht_h = \alpha + \alpha(-1) = 0.$$

This means that the revenue from the bling bling tax will be completely offset by the subsidy on hip hop. The reason is that for each unit you buy of the composite good (α, h) , you effectively pay $w = 1$ in tax and get $w = 1$ in subsidy.

4 Discussion and final remarks

The example of hip hop and bling bling is extreme but may still capture an interesting mechanism. If diamond goods can be heavily taxed without burden – there are of course many real world features that keep the optimal tax on a diamond good from approaching infinity (see Ng, 1987, for some apparent examples including e.g. dynamic effects and cross border/black market shopping) – there are positive fiscal externalities associated with the consumption of such goods. In our stylized model, the individual's demand for diamond goods is a genuine free lunch for the social planner, since all resources spent on it may be taxed away without reducing the individual's utility. If there are close complements to the diamond good, this free lunch may be increased by subsidizing such goods or activities. The model presented here thus prescribes the provoking policy of subsidizing luxury good marketing, tickets to James Bond movies and other movies that endorse prestige consumption, hip hop concerts and, why not, Panache Magazine – but only when the related diamond goods are heavily taxed.

The results in this paper are based solely on efficiency. We have deliberately abstracted from the case when commodity taxes serve a redistributive purpose. This choice was made in order to highlight the key effects by making the derivations tractable and the formulas simple. A reasonable conjecture is

that the pure efficiency effects described here would be modified but not eliminated in a richer model where commodity taxes also serve other purposes, regardless of whether these purposes are of a redistributive or a Pigovian origin.

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