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Patek Philippe, or the Art to Tax Luxuries

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Abstract: Recent experience shows that under certain conditions it can be assumed that demand for luxury goods is partly abnormal. To tackle the problem whether they *can* and *should* be taxed we (a) show that a positive slope of demand is possible by distinguishing snob and network benefits, (b) demonstrate that a willingness to pay systematically lower than the equilibrium price can be explained by false trading procedures resulting (c) from the distinction between sequential and repetitive purchases. Concerning the absolute size of excess burden, a luxury tax should be levied on goods with a high elasticity of demand, but according to the relative criterion under certain (realistic) conditions low ratios may be realized by taxing goods with a high *or* a low elasticity. Conducting a sensitivity analysis, we conclude that in taxing luxuries there is a high risk of generating just the opposite of what was originally intended.

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I. Introduction

According to the famous advertising for the Annual Calendar by Patek Philippe, “You never actually own a Patek Philippe. You merely look after it for the next generation.” For the Annual Calendar (in the following: PP) is certainly a watch perfectly worked out to the last detail, but it is also shockingly expensive, that is to say highly disproportional to average income. Yet, with this slogan, the PP marketing aims at invalidating the effects of the “ostentatious display” and “conspicuous consumption” of luxury goods – which is particularly effective against envious and malevolent contemporaries of luxury consumers, who can be found ubiquitously especially among Germans, if not on the European continent as a whole. For even if someone wears the PP in a conspicuous way, he will not be the true owner of the watch, but more like a steward, temporarily looking after it in his lifetime. Therefore, we are not dealing with ‘ostentatious consumption’, but with some kind of sustainable investment over generations, the price of which then appears more proportionate to average income. Moreover, the PP is being placed near to a dynastic coat of arms which implies that the owner has been active in rearing children and thereby has proven his social responsibility. Which greedy minister of finance would, then, be inclined to levy a tax on such an expense and thus punish socially desirable behavior? Hardly anyone, but one can never be sure with finance ministers.

Therefore, it appears worthwhile to take a closer look at the market for luxury goods and to analyze some of the peculiarities of this market and of a potential taxation of these goods. Obviously, we find ourselves up against something extraordinary: Hellmut Wempe, the largest dealer of luxury watches in Germany, who was cited above, recently stated in an interview in the *Frankfurter Allgemeine Zeitung*, 3 November 2001, that the decrease in turnover due to the bad economic situation and the terrorists’ attacks of September 11 was restricted to the lower price segment of 1500 to 2500 euro. But the “expensive pieces” were not affected, which especially holds for his shop on Fifth Avenue in New York – apparently the phenomenon of luxury fever” (Frank 1999).

There may be a lot of psychology behind this phenomenon, but it can be taken for granted that there is a price segment which seems to be resistant to recessions and terror. On the other hand, this does not mean that the law of demand is invalid, it only asserts that demand, at least for highly expensive watches, does not shrink despite recession and terror, while demand for lower price watches definitely decreases; or to put it another way, demand for luxury watches stays at least constant while average income sinks. This doubtlessly seems exotic, but it is quite explainable; in contrast, a second abnormal property of luxury goods – that demand increases with rising prices – cannot be derived from this situation since variations in price have not been observed. On the other hand, it can be assumed that buyers in the PP segment will not react in a normal way to price increases, but may even increase their demand if the high price itself is an argument for their purchase.

Despite the clever marketing of the PP, the watch would then clearly become an object of "conspicuous consumption" characterized by "ostentatious display" as Thorstein Veblen (1899) named it – it would become a Veblen good.[2] It is commonly assumed that such a break in the law of demand can only happen in a certain middle phase of the demand curve and that in the lower and upper parts the law of demand clearly rules. That is a correct proposition for the normal market for watches, but not in the case of the PP: the Annual Calendar has effectively been placed in the upper price segment, and therefore the PP lacks a biography as a low price watch and consequently the lower part of the demand curve. Even the upper normal part of the demand curve must not be relevant if Patek Philippe does not exaggerate its pricing policy, so that a long-run atypical shape of demand for the Annual Calendar seems to be a plausible hypothesis.

In part II of the paper we shall briefly recur to the theory of optimal taxation and recapitulate, for the normal shape of the demand curve, which policy implications result from it especially if we add to the usual criterion of minimization of the excess burden the additional criterion of minimization of the excess burden ratio. At the beginning of part III we adjust the formal results to the case of luxury goods in order to evaluate in detail how an equilibrium price can exist if the willingness to pay is systematically lower than that price. To this purpose, we develop a model comprising snob and network benefits[3] the results of which will then be applied to the economically relevant case of a demand curve intersecting the supply curve from

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[2] Goods with an atypical demand curve will in the following be designated luxury or Veblen goods. They represent an extreme case of the Veblen effect, which originally denotes that consuming high-priced goods may be good for someone's image or prestige. Harvey Leibenstein (1950, pp. 203) differentiates between the price effect and the Veblen effect of demand: the first refers to the normal reaction of the quantity of demand due to variation in price; the Veblen effect describes a possible decrease in demand with falling prices since – according to Leibenstein – the benefits accruing from the good to consumers will be lower at a lower price. If the Veblen effect dominates the price effect, a positive slope of the demand curve will be the result.

[3] The total benefit that Veblen goods bring to the consumer of luxury goods can be disaggregated into various components. Besides the benefits accruing from the usage of the good, which in the case of luxuries seems to be negligible, network benefits and snob benefits play the major role. Network benefit arise from the function of the good as an intra-group signal of belonging to the group of the rich. Snob benefits refer to the function of the good as an inter-group signal setting apart the group of the rich from the broad mass of people.

above. In part IV we extend our results by contrasting the models of repetitive purchase (normal goods) and sequential purchase (luxury goods) and analyze the effects of luxury goods taxation by applying the familiar concepts of consumer and producer surplus. In part V we combine the results of parts III and IV – and apply the two excess burden criteria to the PP case. Part VI summarizes the results and answers policy questions from an allocative and distributive perspective: could and should luxury goods be taxed – or would it be better to keep one's hands off?

II. Excess Burden, Welfare and the Excess Burden Ratio for Normal Goods

Taxation is regarded as neutral and non-distorting for the structure of relative prices if it is levied as a lump-sum tax exhibiting an income effect only; but if there is an additional substitution effect taxes are indeed distorting and welfare-reducing. Let us first look at the normal case of a falling (linear) demand and a rising supply or marginal cost curve respectively. A tax on the normal good shifts the supply curve to the left, increases the equilibrium price and decreases equilibrium quantity, thereby reducing the sum of consumer and producer surplus and hence welfare. The loss in welfare consists of (a) the tax payments on the goods purchased, which seen from the economy as a whole are only transfer costs since benefits will accrue somewhere else in the economy due to their expenditure, and (b) an excess burden as the "real" welfare loss of aneutral taxation for, by taxing and reducing quantities demanded, positive (marginal) net benefits are lost to the economy. To minimize that loss of net benefits is the target of optimal taxation. By keeping a certain point on a given demand curve fixed and varying its slope while keeping the supply curve constant (before and after taxation), it can be shown that this welfare loss will be the lower the steeper the demand curve or the more inelastic it is at the chosen point. From this, the Ramsey rule for an optimal taxation, the following result emerges: if it is necessary (e.g. due to pressures from globalization and the competition of tax systems) to make way for a higher degree of indirect taxation, then such goods should be taxed predominantly for which the demand is inelastic, or put in another way, the tax rate and the price elasticity of demand should be related negatively, that is, the tax rate can be the higher (with an identical excess burden), the lower the price elasticity and *vice versa*.

It would now be conceivable to employ the relative share of the excess burden (EB) on the welfare in the initial situation (W_0) as the criterion for welfare maximization instead of the minimization of the absolute excess burden. It can plausibly be presumed that in the normal

case both criteria will point in the same direction. This follows simply from the fact that the minimization of EB with constant tax revenue works by shifting the tax burden onto highly inelastic demand, but that welfare before taxation W_0 also increases with the steepness of the demand curve so that EB/W_0 will be minimized, too. This relationship can easily be formalized for the case of a normal good and forms the basis for an extension towards the analysis of luxury goods.
For sake of simplicity we further assume a very comfortable supply function[4]

$$(1)\ S_0 = 1X$$

and a tax t on the normal good so that the supply function after tax will be

$$(2)\ S_t = 1X + t$$

On this after tax supply curve we arbitrarily choose a point p_t, X_t and assume that all potential demand curves run through this particular point[5]. This procedure enables us to keep tax rate t and the resulting revenue T constant while varying the slope of the (to X = f(p) inverse) demand curve, and to calculate the b-dependent shapes of absolute EB and the EB ratio related to welfare before tax. For a normal demand curve with a negative slope $P_t = a - bX_t$ or $a = P_t + bX_t$ hold respectively so that it follows for the generalized demand curve running through the chosen point that:

$$(3)\ D = P_t + bX_t - bX$$

From this generalized demand curve the equilibrium quantity before tax can be derived from (1) and (3) to give

$$(4)\ X = \frac{P_t + bX_t}{b+1}$$

[4] The choice of this very special supply function – isoelastic with a slope of 1 – exclusively serves to simplify further calculations; a more realistic choice, however, would not change the essential conclusions from this simplified analysis.
[5] According to the supply function chosen it holds that $t = P_t - X_t$

Of course, the equilibrium quantity after tax is always X_t due to the special procedure chosen here. EB can be calculated as the difference of the integrals between X and X_t of the demand and supply functions respectively which leads to

$$(5)\ EB = \frac{(P_t - X_t)^2}{2(b+1)}$$

From formula (5) we recognize the validity of the Ramsey rule for the normal shape of the demand curve: the larger b (the steeper D), the lower EB will be.

Welfare before tax W_0 is determined by the sum of consumer and producer surplus which is equivalent to the difference of the integrals of the demand and supply functions within the boundaries of 0 and $X = (P_t + bX_t)/(b+1)$.

$$(6)\ W_0 = \frac{(P_t + bX_t)^2}{2(b+1)}$$

For the EB ratio, the relative loss in welfare due to taxation, it follows that

$$(7)\ \frac{EB}{W_0} = \frac{(P_t - X_t)^2}{(P_t + bX_t)^2}$$

From the formal results of (5) to (7) it can be concluded that

- EB falls with increasing b because the denominator rises,
- W_0 increases with rising b because the numerator term increases more strongly than the denominator due to being squared[6],
- EB/W_0 falls with rising b since b appears only in the quadratic term of the denominator while the numerator is a constant (or more exactly: is identical to the tax rate t due to the slope of the supply curve of 1).

The result, therefore, is that in the case of normal demand functions it makes no difference whether we refer to the absolute size of EB or the EB ratio as policy criteria – both criteria

[6] It is true that according to the special supply function chosen we could substitute $a^2 / 2(b + 1)$ for W_0, which at first glance could suggest presuming a falling W_0 with rising b, but that would be a fallacy because a itself is an increasing function of b.

lead in the same direction and imply the same tax policy advice: EB and EB/W_0 are the smaller, the lower P_t - X_t = t and the larger b are, hence the lower the price elasticity of demand at the chosen point p_t, X_t . The open question is whether these conclusions hold for the luxury good case too, but an answer to this question requires some conceptual considerations beforehand.

III. Luxury Goods: Some Basic Microeconomics

If we now assume that Veblen goods characterized by a (positive) external price effect of consumption are given and, therefore, demand rises with the price of the luxury good, then we first have to adjust the terms (3) and (4) correspondingly. Since we have derived the generalized demand function for the normal case, this implies that now in the case of luxury goods the variable b has to take on an opposite, negative, value which leads to

(8) $D = P_t - bX_t + bX$ and

(9) $X = \dfrac{P_t - bX_t}{(1-b)}$.

With regard to EB such an adjustment is imperative, too, which results in

(10) $EB = \dfrac{(P_t - X_t)^2}{2(1-b)}$.

With regard to the determination of W_0 for luxury goods some basic considerations seem to be necessary: the abnormal demand function for luxuries may cut the supply curve from below or from above at the point p_t, X_t ; if it intersects from above, Marshall stability of the equilibrium is given, but if it cuts from below the equilibrium will not be stable, and the reverse holds for Walras stability in this case of atypical demand. With regard to welfare before tax this distinction makes no difference, but in both cases there will be an equilibrium price which is higher than marginal willingness to pay.

The analysis of normal goods leads us to the question how such a price could come about, for at prices below the equilibrium price consumers will not be willing to buy units of the luxury good. In order to solve this puzzle, it is useful to disaggregate the benefits of the luxury good into its main components by referring to the motives of the buyer, and to tackle the problem from an evolutionary perspective. So let us assume somebody is to be the first buyer of a luxury watch like our famous PP and his/her purchasing motive is to be the only one on this planet to possess that watch; of course, he or she will be a snob and the buying motive is certainly intrinsic. Since the watch is extremely expensive its ubiquity will also be extremely low, but the first buyer cannot exclude that there will be a second buyer, a third buyer and so on. If this is the case, the marginal benefit from the snob motive will be reduced with every additional buyer, but this will be overcompensated by an extrinsic motive: if several of these watches are bought, their familiarity increases in those circles which can afford such an investment, and demand will rise the more well-known the watch becomes – or the larger the number of "acquaintances" (members of the group at stake or prominent people) who wear it. In other words, the watch procures network benefits to its owner and additionally serves as a signal that he or she belongs to the club of the rich and the privileged, and it performs this function the better the more people buy and wear the watch, which also means that they are conscious of its signaling value – and exactly that is the price effect of consumption in the case of Veblen goods.[7]

Let us consider an example which illustrates the sharp distinction between a normal good and a Veblen good such as the PP. With normal goods it can be expected that the next unit of the good consumed will be characterized by decreasing additional benefits; in the PP case the next unit for the same individual would have a value of nil. What would be the good of possessing a second copy of the PP –with regard to neither snob benefits nor network benefits would this be a rational option.[8]

So it can be taken for granted that any particular individual will always buy only a single PP, and that means that the problem shifts from the number of units of the good to the number of persons or buyers. Let us assume that our class of the well-to-do consists of 6 persons, and let us consider the problem initially from the perspective of the first buyer (the pioneering consumer); let us further assume that snob benefits (SB) fall with the number of additional purchases by other people, but that network benefits (NB) rise (relatively more strongly).

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[7] Usually social contacts or relationships serve to reduce the risk of choosing between goods by collecting information; here it is the other way round: the signaling effect of the PP (of the good itself) serves to reduce the risk of taking up social relations, a fact which was recently emphasized especially by Haucap (2001).

[8] That must not always be so: from the car sector and – we have to admit – in the past, the joke was well-known that someone should always have two Jaguars because one of them would always be at the garage being repaired.

	(1)	(2)	(3)
	SB^1	NB^1	TB^1
1. Buyer	5	0	5
2. Buyer	4	2	6
3. Buyer	3	4	7
4. Buyer	2	6	8
5. Buyer	1	8	9
6. Buyer	0	10	10

Table 1: Snob, Network and Total Benefits from the Perspective of the First Buyer

In this example total benefit from the perspective of the first buyer develops in a linear way: When the fifth individual buys his PP, a benefit of 9 accrues to the first buyer, and the additional benefit if one buyer is added is constantly 1. If we assume that the purchases are equally distributed over time, then the first buyer has a time-span where he is the only owner of a PP, he has another phase where a further individual uses the PP, and still another time-span where a third buyer enjoys the PP and so on; over all these time-spans a cumulative benefit arises in favor of the first buyer which we shall call TB^1_{cum} and which represents the cumulative sum of TB^1; if, for example, in phase 3 there are 3 buyers of the PP, 18 benefit units fall to the first buyer. If we assume heroically that all individuals show identical valuations (preferences) of SB and NB and that the only distinction between them is the point of time of their appearance on the scene, then, necessarily, the sequence of cumulative benefits for the second buyer is of a lower level than of the first buyer, and for the following buyers this holds analogously. Table 2 presents this in detail:

	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	TB^1_{cum}	TB^2_{cum}	TB^3_{cum}	TB^4_{cum}	TB^5_{cum}	TB^6_{cum}	TSB_{cum}	MSB
1. Buyer	5						5	5
2. Buyer	11	6					17	12
3. Buyer	18	13	7				38	21
4. Buyer	26	21	15	8			70	32
5. Buyer	35	30	24	17	9		115	45
6. Buyer	45	40	34	27	19	10	175	60

Table 2: Total Social and Marginal Social Benefits of the Well-to-do

Now, if we want to calculate the total social benefit TSB_{cum} for the people of the “leisure class” (Veblen), we only have to add the figures horizontally to get total social benefit up to the i-th phase or the i-th buyer respectively; the same result would necessarily follow if we multiply the TBs in every phase (column 3, table 1) with the number of buyers in this phase (leading to TSB^i in every phase) and add the results cumulatively. The marginal social benefits MSB – mathematically somewhat loosely interpreted – can then be derived by taking the differences between subsequent TSB_{cum} , or are directly attainable as the TSB^i in every phase or with every buyer respectively. It is easy to see (column 11, table 2) that in this example MSB increase progressively. The essence of these calculations is, therefore, that under certain conditions we absolutely do have to reckon with a positive slope of MSB (or the demand function for PP) – it is irrelevant at the moment whether this slope develops progressively or degressively, what counts is the mere possibility of a positive slope.

Going beyond this example one has to ask when such a positive slope of marginal social benefit or the demand curve will appear. For this purpose we recur to the disaggregation of total benefits into snob and network benefits where both components can have a progressive or degressive shape but, plausibly, SB will be falling and NB will be rising with an increasing number of buyers. Since demand curves can be interpreted as marginal benefit curves, we have to answer the question under which conditions regarding progressivity or degressivity an abnormal marginal benefit curve will result as the sum of both benefit components. A first step in this direction is the consideration that an abnormal marginal benefit curve also means that the sum of both benefit components must exhibit a minimum because only in that case can the marginal benefit curve have a positive slope. It is then easy to show that this will be the case if the (positive) slope of the network benefits is always larger than the (negative) slope of the snob benefits. Regarding the shapes of the benefit components there is only one single case where the existence of a minimum can generally be excluded: this is the combination of a progressively falling snob benefit and a degressively rising network benefit since then the above-mentioned relation of slopes will not be given.[9]

But with these elaborations the puzzle still has not been solved because marginal willingness to pay is still lower than the equilibrium price till the supply curve (marginal cost) intersects

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[9] If we assume the following functions for $SB = - aX^m + d$ and for $NB = cX^n$, there will be an extreme value for total benefit $X = (am/cn)^{1/(n-m)}$. The second derivative is > 0 (minimum) if $n > m$ holds. In those cases where $n > m$ holds as well as

- $m \geq 1, n > 1$ (progressive development of both benefit components)
- $m \leq 1, n \geq 1$ (degressively falling SB, progressively rising NB)
- $m < 1, n \leq 1$ (degressive development of both benefit components),

there will be a minimum which means that marginal benefits have a positive slope. Especially in the case of $m \geq 1, n \leq 1$ – progressively falling SB and degressively rising NB – a minimum can be excluded and therefore an abnormal demand function too. Of course, the same holds for $m > 1$ and $n > 1$ (progressively rising NB) if n is not sufficiently large in the sense of $n > m$.

the demand curve (marginal benefit). So let us get back to the basics again: in the normal case consumer surplus is determined as the difference between aggregated willingness to pay and aggregated expenditures for the good in question. Therefore, consumer surplus (CS) is a measure for the expenditures saved if transactions take place at the equilibrium price; it is also a measure for the gain to consumers if transactions happen at the equilibrium price in contrast to false trading at the respective (falling) prices. Furthermore, producer surplus (PS) is nothing but the difference between revenues and costs; it is also a measure for the gain to producers if transactions take place at the equilibrium price in contrast to false trading at the respective (rising) supply prices.[10] In the case of luxury goods marginal willingness to pay is systematically lower than the equilibrium price till this equilibrium price is reached, and we have to distinguish between two cases according to Figure 1:

(a) the demand curve has a smaller slope than the supply curve[11]

(b) the slope of the demand curve is larger than that of the supply curve.

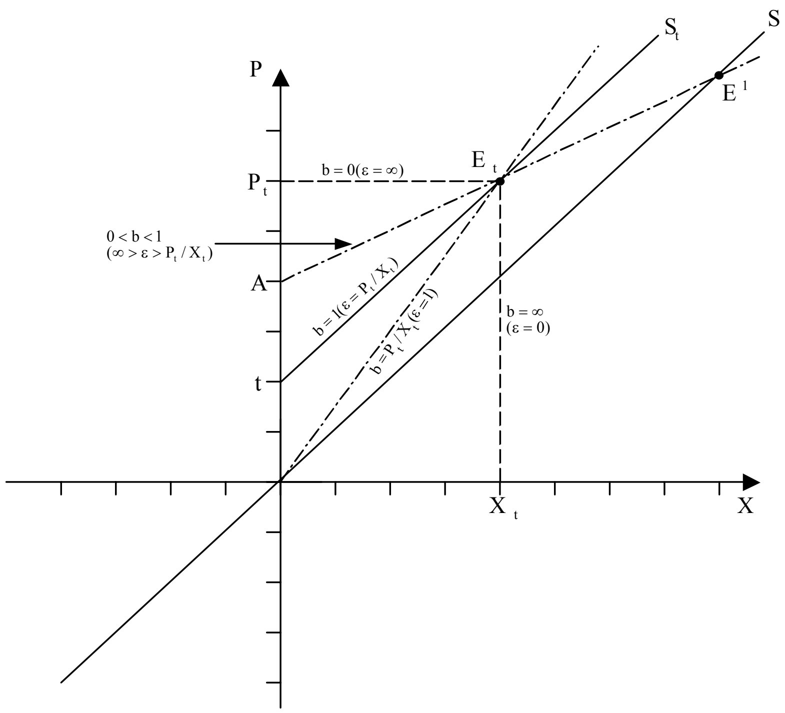

Figure 1: The Case of Luxury Goods in Different Variations of Demand[12]

[10] Since total surplus consists of marginal surpluses as differences between demand and equilibrium price (CS) and equilibrium and supply price (PS) at all quantities possible up to the equilibrium quantity, this kind of analysis systematically fits the concept of Marshall stability which compares demand and supply prices at given quantities and deduces reactions on the supply side.

[11] For the sake of simplicity we employ a linear approach here. Therefore, the analysis is very "stylized" for according to footnote 8 marginal benefit for $X = 0$ should take the value of 0 (and total benefit the value of d) and not a positive or negative value as in the linear approach. That means that a "cutting from above" of the supply curve by the demand curve – the minimum condition $n > m$ of total benefits for rising marginal benefits assumed again – can only happen if there is a degressively rising shape of the demand curve and *vice versa* a "cutting from below" if there is a progressively rising shape.

In case (a) the demand price is higher than the supply price up to the equilibrium price. With a normal demand curve, welfare at the equilibrium price is determined as the integral of the difference between the willingness to pay (WP) and the equilibrium price from zero up to the equilibrium quantity (CS) plus the integral of the difference between the equilibrium price and the marginal costs or the supply price (PS) within the same boundaries. If the WP-function cuts from above, this calculation leads to a negative CS and the usual PS; thus, if transactions occur at the equilibrium price, total surplus results as the integral of the difference between the demand and supply price from zero up to the equilibrium quantity. But just that is not the case on a market for luxury goods: purchases and sales take place through false trading at the demand price due to the prevailing excess demand. Buyers will enjoy a higher "conspicuous" price (the equilibrium price arising later in the purchase sequence) instead of the actual price they pay. This conspicuous price is denoted by Leibenstein (1950, pp. 203) as the price which determines the "conspicuous consumption utility". On the one hand this means that after reaching the equilibrium price expenditures measured as the aggregate price savings through false trading are avoided – exactly this is the CS on the market for luxury goods (P_tE_tA). On the other hand, the producers have sold the luxury goods at lower prices than the equilibrium price (exactly at the demand price); because this demand price is higher than the supply price up to the equilibrium price, the PS on the market for luxury goods is equal to the aggregate surplus resulting from the difference between the demand price and the supply price (AE_tt). Total surplus is then equivalent to welfare W_0 in the initial situation before taxation, and is nothing but the conventional PS in the case of a normal demand curve (P_tE_tt).

In case (b) the equilibrium price is again higher than marginal WP up to the equilibrium price but the demand curve cuts the supply curve from below. This means that the demand price is systematically lower than the supply price, and via false trading the demand price prevails systematically. In this Marshall unstable case the equilibrium price – if it exists – is a rather random event, and after an exogenous shock, prices and quantities will be driven up or down. In case (a) reaching the equilibrium price can be seen as an indicator for the establishment of the luxury good as a status symbol and signal, stable and resistant to exogenous shocks; in case (b) it is systematically not recognizable how this unstable equilibrium price could come into existence, and if it ever exists it could not be interpreted as an indicator for the establishment of the product as a status symbol because it might lose its status-representing character

[12] For a general derivation of the term for the price elasticity of demand see the beginning of part VI.

abruptly: via a negative shock by falling prices or via a positive shock by rising quantities.[13] Taking stock: if the equality of marginal utility and marginal costs secures optimality and total benefit is larger than total cost additionally, then in case (a) the optimum represents a stable equilibrium. In case (b) there is an intersection of marginal utility and marginal cost functions too, but it clearly is not an optimum because the non-negativity condition is not fulfilled for the net benefits and the point of intersection does not represent a stable equilibrium. Therefore, case (b) will be ruled out in the following as an equivalent case (despite some side-long glances where it seems appropriate).

IV. Luxury Goods: The Economics of Sequential Purchases

In the case of normal goods one has to compare the sums of consumers' and producers' surplus in comparative-static analysis before and after taxation; the difference is the sum of tax revenue and the excess burden (EB). EB is the real welfare loss of taxation (as the positive surplus between marginal WP and marginal costs from after-tax up to the pre-tax quantity), while tax revenues are only transfer costs (welfare neutral transfers) seen from the economy as a whole. In the comparative-static analysis of the normal good the question is irrelevant whether taxation has effects on the wealth of "old" owners (early buyers) of the good because the old-new distinction makes no sense here and the comparison of prices and quantities in two equilibrium situations is the only point of interest. We shall return to that later on.

This is different in the market for luxury goods. If, as in our example, 6 persons have bought the highly expensive PP one after another and an equilibrium price has arisen in this way, the levying of a luxury tax in the case of a demand curve cutting from above leads to a decline in prices and quantities, and, correspondingly, to a reduction of total surplus. Because tax revenues are only transfer costs, the welfare situation before and after taxation only differs *cum grano salis* in the traditionally measured excess burden and a negative wealth effect on the "old" owners or early buyers.

[13] Falling prices have a negative effect on the selectivity of the network and increase the risk of establishing social contacts; "too" strongly increasing quantities (with increasing prices) certainly do not do that but they can reduce the exclusivity of the network. This induces speculation that there might be an optimal size of the network – it cannot increase indefinitely because exclusivity also implies scarcity.

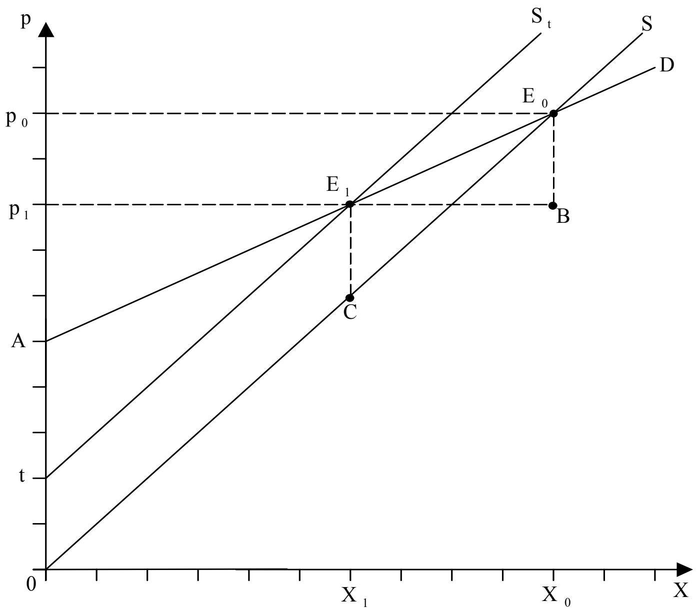

Figure 2: A Luxury Good with a Demand Curve Cutting from Above

Let us consider this case in detail using fig. 2. Because marginal WP is lower than the equilibrium price up to the equilibrium quantity, a process of sequential purchase occurs: the marginal WP grows with increasing quantities sold and prevails because of the lower supply price. Consequently, the marginal CS_{pt} (pt = pre-tax), or the avoided expenditures compared to transactions at the equilibrium price, falls with increasing quantity until it finally becomes zero when reaching the equilibrium price. Regarding CS_{at} (at = after-tax) the process runs analogously, but with the modification that either there would have been fewer "old" owners (X_1) if they had been confronted with the luxury tax right from the beginning, or that fewer new owners of the PP will enter the market if the tax is implemented during the process of the sequential purchase before X_1 is reached. Here, we will concentrate on the first alternative. In the case of transactions at the demand price and sequential false trading, producers' surplus PS is nothing but the (positive) difference between the demand and supply price, and that holds for situations before and after taxation. The (larger) CS_{pt} (Ap_0E_0) consists of the (smaller) CS_{at} (Ap_1E_1) and a joint effect V ($p_1p_0E_0E_1$). This joint effect V is composed of the loss in wealth of the old owners as a result of the drop in price ($p_1p_0E_0B$), balanced with the positive CS of a part of the old owners (since WP' > p_1) at the new price p_1 between X_0 and X_1 (E_1E_0B). Analogously, PS_{at} (tAE_1), tax revenue ($0tE_1C$) and excess burden (CE_1E_0) add up to PS_{pt} ($0AE_0$). Therefore, total surplus before taxation ($0p_0E_0$) consists of the total surplus after taxation (tp_1E_1) plus the joint effect V, dominated by the wealth effect on the old owners ($p_1p_0E_1E_0$), the tax revenue ($0tE_1C$) and the excess burden (CE_1E_0). So, in the case of a demand curve cutting from above, a negative wealth effect on the old owners has to be registered – a kind of *first-buyer-disadvantage* on the market for luxury goods.[14]

Proceeding from this detailed analysis of the surplus situation we have to note that *repetitive* purchases are typical on the market for normal goods – the consumer repeats his purchase because even a certain stock of normal goods will be used up at some point in time. A tax per unit of a normal good will certainly increase the price and decrease the consumption per period so that the frequency of purchase repetition will fall too, but the expenditures saved by the stockkeeper are only transitory and fall on average with the number of purchase repetitions; for exactly this reason, a wealth effect is irrelevant in the case of *repetitive* purchase, as it will have evaporated over time. For Veblen goods and ostentatious consumption this repetition effect vanishes because it does not make sense to purchase a second PP if one already owns one. Whereas in the normal good case, the *same* individual *repetitively buys* the *same* good, in the luxury good case *different* individuals buy the *same* good *sequentially* (from the first buyer up to the n-th buyer) so that the repetitive effect drops out here and a potential wealth increase or loss following the imposition of a luxury tax does *not* evaporate over time.

Because of the typically simultaneous occurrence of an excess burden and a loss in wealth (or an excess benefit and a wealth increase in the irrelevant case) as shown above, one could share the opinion that this kind of wealth effect should additionally be considered, regarding the problem of an optimal taxation of luxury goods A closer look proves this opinion untenable: as demonstrated above, welfare situations are described by the sum of the consumers' and producers' surplus, and wealth effects are integral parts of these surpluses (more precisely: of the consumers' surplus). Certainly, the relative variation of welfare between the groups of old and new owners of the PP as a result of taxation is – with regard to the distributional effects of luxury taxes – of economic interest, but concerning the question of an optimal taxation the allocative effect of the taxation of luxury goods plays the decisive role: do quan-

[14] Indeed, we have above classified the case of a *demand curve cutting the supply curve from below* as being practically irrelevant (last but not least because a negative PS would occur*),* but nevertheless a small side-glance should be permitted: by taxing luxury goods a reverse effect would occur in the sense that equilibrium price and quantity increase; whereas via false trading with sequential purchase there would be exactly X_0 old owners before taxation, we would now have X_1 old owners (with $X_1>X_0$), if the tax were established at the very beginning, or X_1-X_0 new owners would appear on the scene if the tax were introduced at the time when there were X_0 buyers. It can be shown analogously that in this case an excess benefit is caused by the tax, and that a positive wealth effect on the old owners occurs – a kind of *first-buyer-advantage*.

tity changes due to the tax lead to a dropping out or adding up of areas where the marginal willingness to pay is higher than the marginal costs?

In practical politics these two aspects are usually mixed up; in the economic analysis, however, both aspects should be treated separately in a rigorous manner –although we depart from this principle a little in section VI, where we employ a distributive, envy-related perspective. Therefore, in the following we shall mainly concentrate our analysis on the allocative aspects of the problem.

V. Taxation of Luxury Goods: A Comparison of Criteria

Returning to the beginning of part III, the formal terms already adapted to the luxury case have to be complemented by the corresponding equations for W_0 and EB/W_0 based on the discussion in section IV. Independently of b (> 0) being larger or smaller than 1, W_0 results from the following consideration: in the case of false trading, CS is the aggregate marginal difference between the equilibrium price and the WP, and PS is the aggregate difference between the demand and supply prices (and negative for b >1) so that in sum the conventional PS for normal demand curves results again as the total surplus. With the necessary algebraic sign-adjustment of b it follows that:

$$(11)\ W_0 = \frac{(P_t - bX_t)^2}{2(1-b)^2}$$

In accordance with (10) and (11) the EB ratio is

$$(12)\ \frac{EB}{W_0} = \frac{(P_t - X_t)^2(1-b)}{(P_t - bX_t)^2}$$

Considering first an exemplary simulation with the arbitrarily chosen data of $p_t = 6$, $X_t = 4$ and t = 2, it can be recognized that the luxury case – exemplified for the Marshall stable case with the slope of the demand curve smaller than that of the supply curve (= 1) – differs substantially from the normal case (see part II) according to figures 3 and 4.[15]

- With regard to EB it can be observed (fig. 3) that its value increases with rising b; [16]

- EB/W_0 forms an inverted U-function (fig. 4) in the relevant b-interval so that low EB/W_0 values can be achieved both with low and high b-values.

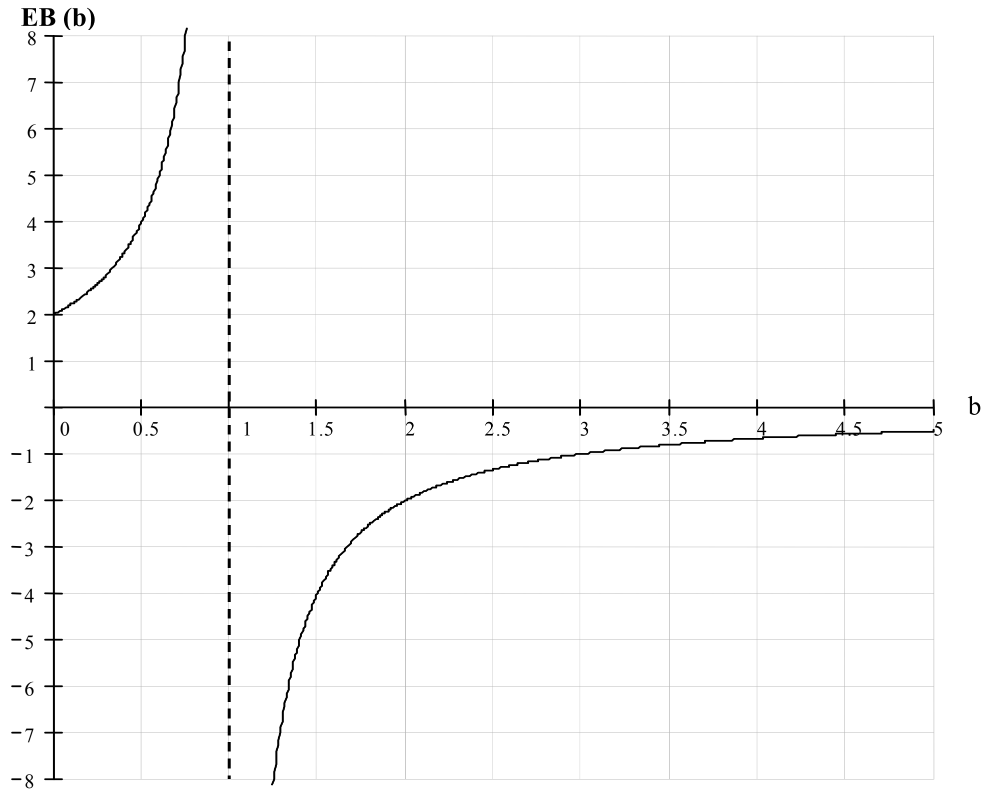

Figure 3: Taxation of a Luxury Good: Excess Burden - Excess Benefit

[15] The above-mentioned slope condition implies that the demand curve also cuts the after-tax supply curve from above. Leaving the linear approach and turning to general functions as in the corresponding footnotes above, the linear demand curve has to be replaced by a marginal benefits curve increasing degressively. Obviously, then, two points of intersection with the after-tax supply curve may result: the lower one, corresponding to a low price, is Marshall unstable, the upper one, however, is stable and equivalent to the equilibrium in the linear approach.
[16] Analogously, this hold too for the development of W_0 with rising b which is not presented here.

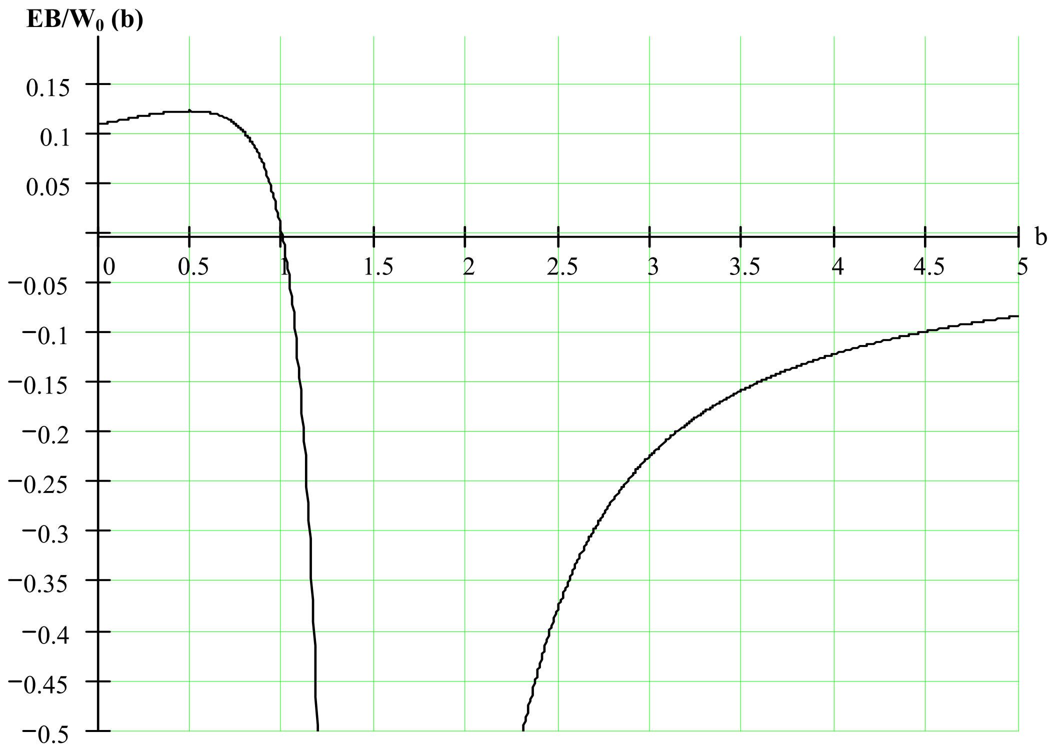

Figure 4: Taxation of a Luxury Good: Excess Burden/Excess Benefit-Ratio

In detail: The *lowest* value b can take on in the luxury case is b = 0. In this case, EB would be $(p_t - X_t)^2/2$ and $EB/W_0 = (p_t - X_t)^2/p_t^2$. Remember that X_t and p_t are points on the S_0-function shifted parallel by the amount of t which can be freely chosen. Because of our simplified supply function $S_0 = 1X$ it follows that $p_t = 1X_t + t$ where t is an exogenous constant. This means that EB at b = 0 is independent of the choice of the point on the shifted supply curve which all (variable) demand curves run through, and EB is always $t^2/2$. This is different for the EB ratio: the higher p_t is chosen on the shifted supply curve $p_t = 1X_t + t$, the smaller is $EB/W_0 = t^2/p_t^2$, or in other words, the higher the "critical" price from which demand develops in the luxury case, the smaller is the EB ratio. Summing up, this means that EB only depends on the tax rate, and the lower it is the lower EB will be too. EB/W_0 depends on the tax rate in the same way but on p_t as well: with a given t, the EB ratio declines when p_t rises, or in other words, with regard to a low EB ratio higher tax rates could be tolerated if p_t is high.

The *highest* value b (with $b \leq 1$) can rise to is 1. Irrespective of the chosen point on the after-tax supply function, EB rises towards infinity and EB/W_0 declines towards 0. Since in our framework here p_t must always be larger than X_t because $p_t = 1X_t + t$ and $t > 0$, the numerator of the EB ratio cannot become negative. This also means that in the interval between b = 0 and b = 1 there *can* be only a maximum, but it is not necessarily given. Such a maximum occurs for $b = (2X_t - p_t)/X_t$ if (for $b > 0$) $2X_t > p_t$ holds, and that also implies that $X_t > t$ and $p_t > 2t$ hold respectively. If this is not the case, the maximum lies outside the range of reasonable b-values, and the highest EB ratio results at its lower end. If a maximum exists within the interval $0 < b < 1$, it will be closer to $b = 1$ at a given t, the larger X_t and p_t are respectively. In this case the maximum value of EB/W_0 is $(p_t - X_t)/4X_t$, and it will be the smaller, the larger X_t or p_t is. The conclusion is that on the one hand at $b = 0$ with increasing p_t lower EB/W_0 values result, but that on the other hand the value of the maximum decreases and *vice versa* – all this with regard to the equivalent conditions for a maximum in the b-interval in form of $2X_t > p_t$ or $X_t > t$ or $p_t > 2\,t$.

The main conclusion with regard to EB is first of all that the Ramsey rule is not applicable in the case of luxury goods. Luxury goods with a relatively large slope of the demand curve (but < 1) or a relatively low elasticity (but $> p_t/X_t$)[17] should not be taxed because EB will then become very large. On the other hand, goods with a relatively low slope of the demand curve (but > 0) or a high elasticity could be taxed due to low EB values if a moderate tax rate is chosen. Whereas the Ramsey rule requires $t \sim 1/|\varepsilon|$ for normal goods, $t \sim |\varepsilon|$ is valid in the case of luxury goods. Besides, while in the case of normal goods both criteria EB and EB/W_0 lead in the same direction with regard to tax policy, we have to differentiate now: if a maximum exists in the interval $0 < b < 1$ and, therefore, $p_t > 2\,t$ holds, then with regard to EB only the goods with a high elasticity should be taxed. As far as EB/W_0 is concerned, goods with a high elasticity as well as with a low elasticity could be taxed, especially if in the first case p_t (and the critical price for a positive demand) is high. If no maximum exists in the range of positive b-values, the EB ratio can only be minimized at a high b-value or a low elasticity of demand.

Therefore, the minimization of EB alone resulting from the taxation of highly elastic demand can easily come into conflict with the target of minimizing the ratio: exclusively in the case where a maximum exists in the positive b-range *and* a low b (a high ε) do both criteria point in the same direction; in all other cases, policy recommendations resulting from these considerations are not only inconsistent – they are contradictory. This is especially true if goods with a low price elasticity are taxed following the path of minimizing the EB ratio, because this would maximize the absolute EB. Both targets together can only be accomplished by the taxation of highly elastic demand, combined with high critical prices with regard to the EB ratio[18],

[17] See the beginning of part VI for a general derivation of the elasticity.

[18] Once again a side-glance at the irrelevant case that the slope of D is larger than that of S may be permitted: in figures 3 and 4 it is shown that the EBs (and therefore EB/W_0 too) now become negative, which means that as a

which however, essentially assumes that the maximum condition $p_t > 2t$ is fulfilled. Still, whether the price of the luxury good will be higher than twice the luxury tax is hard to predict *ex ante* – the actual degree of greed of finance ministers for revenues and the level of social envy in a society are beyond the reach of a general discussion.

VI. Conclusions and Policy Questions

A summarized interpretation of the results requires the determination of the general form of the elasticity for luxury goods. From (8) we can calculate ε as $(P_t - bX_t + bX) / bX$, and because of our interest in the elasticity at point p_t, X_t, X can be replaced by X_t which leads to $\varepsilon = P_t/bX_t$. If b = 1 holds (identical, therefore, with the slope of the supply function), then $\varepsilon = p_t/X_t$ follows; if $b = p_t/X_t$ holds, ε = 1 will of course be the result. This leads to the following table 3:[19]

	Excess Burden and Excess Burden Ratio
Normal good:	
Segment	$0 < b < \infty$ ($\infty > \varepsilon > 0$)
Criterion EB	- declines with rising b (with declining ε)
Criterion EB/W_0	- declines with rising b (with declining ε)
Luxury good:	
Segment	$0 < b < 1$ ($\infty > \varepsilon > p_t/X_t$)
Criterion EB	- declines with declining b (with rising ε)
Criterion EB/W_0 (with $p_t > 2$ t)	- declines with declining b (with rising ε) - declines with rising b (with declining ε)
Criterion EB/W_0 (with $p_t < 2$ t)	- declines with rising b (with declining ε)

Table 3 Normal Good and Luxury Good: Results and Policy Recommendations

As we have seen, the taxation of normal goods is largely unproblematic: both criteria point in the same direction so that absolute and relative excess burden are minimized if goods with the lowest possible ε are taxed, in other words, if demand is highly inelastic.

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result of taxation now e*xcess benefits* occur. With regard to EB, it can be seen that the excess benefits decrease with rising b; obviously, the ratio EB/W_0 increases (in absolute terms and interpreted as excess benefits) in the range between b = 1 and b = 1.5; for b-values > 1.5 , however, it decreases again.

If the taxation of normal goods according to the Ramsey rule is a simple task, taxing luxury goods is more like an art. In detail: in the range $0 < b < 1$ ($\infty > \varepsilon > p_t/X_t$) an excess burden exists for both types of goods, but in the luxury case it is minimized if goods with a *high* elasticity are taxed – a reversal of the Ramsey rule. Besides, the relative criterion is ambiguous here: if $p_t < 2t$ holds, the two criteria clearly point in opposite directions. If $p_t > 2t$ holds, it is also possible to minimize EB/W_0 by taxing goods with *high* as well as *low* elasticities – with high elasticities especially for p_t´s which are high as well. Exclusively in this last case do both criteria unambiguously point in the same direction.[20]

With regard to the size of the EBs, $b = 1$ ($\varepsilon = p_t/X_t$) is the separating line between excess burden and the rather theoretical excess benefits in our setting here. From an *allocative-utilitarian* point of view, which postulates the minimization of excess burden, goods with a high elasticity ($\varepsilon \rightarrow \infty$) should be taxed. From a *distributive-envy-related* perspective, which aims at maximizing excess burden, exactly the opposite results: goods with an elasticity near to but larger than $\varepsilon = p_t/X_t$ should be taxed.

Obviously, such results imply serious policy problems because the demand curves and the current positions on them have to be known in order to formulate an optimal policy. In the utilitarian version, no such problem exists for the minimization of the excess burden for goods with $\varepsilon \rightarrow \infty$, but there is a considerable problem in the envy-version, because policy-makers would run the risk of an abrupt change from the maximizing of excess burden to the maximizing of excess benefits at ε around p_t/X_t.[21] However, it is more than unlikely that the necessary data will be available to solve this problem, and the stopgap of maintaining a safe distance from the separating line $\varepsilon = p_t/X_t$ comes into conflict with the maximizing or minimizing requirement, for both the excess burden and the excess benefits rise or fall exponentially near to $\varepsilon = p_t/X_t$. Policy-makers will be on the safe side only if the excess burden ($\varepsilon \rightarrow \infty$) in the utili-

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[19] It goes without saying that with regard to the elasticity of normal goods the same formal term can be derived, but with a negative sign. Since we are only interested in absolute values here, b and ε are consequently defined in absolute terms for the normal goods case. In the luxury goods case b and ε are positive anyway.

[20] Once again we look at the practically irrelevant case, where the slope of the demand curve is larger than that of the supply curve: we see that now in the segment $1 < b < p_t/X_t$ ($p_t/X_t > \varepsilon > 1$) excess benefits occur which rise with an increasing ε. With regard to the relative criterion the opposite pattern emerges: the ratio is large if ε is small. In the segment $p_t/X_t < b < \infty$ ($1 > \varepsilon > 0$) excess benefits of taxation occur too, rising again with an increasing ε. Here, both criteria point in the same direction again: the EB/W_0-ratio is also larger if ε is large in this segment.

[21] In the case of the excess benefits the opposite problem arises, and here the utilitarian version is concerned:

tarian version and the rather theoretical excess benefits ($\varepsilon \to 0$) in the envy-version are minimized; it is, however, more than questionable whether the data situation is sufficient even for that. Taxing luxury goods seems to be a difficult business.

Unfortunately, the same message holds for the EB ratio too. The minimization of the excess burden ratio works in the utilitarian version in the case of $p_t > 2t$ with elasticities near to but larger than p_t/X_t as well as with $\varepsilon \to \infty$, if p_t is sufficiently large; in the first case, however, the policy would run a high risk because for $\varepsilon < p_t/X_t$ excess benefits occur which develop exponentially. The envy version is a little more complicated here: in the case of $p_t > 2t$, the maximizing of the excess burden ratio at $b = (2X_t - p_t)/X_t$ or $\varepsilon = p_t/(2X_t - p_t)$ respectively assumes small X_t -values (together with small p_t´s) because of the ratio's maximum value of $(p_t - X_t)/4X_t$. If these are not given, a lower than maximum excess burden ratio will be the result.[22] If, however, $p_t < 2t$ holds, which implies only a local maximum at the lower end of the b-range, the EB ratio will be maximized for $\varepsilon \to \infty$ without running the risk of an abrupt conversion of excess burden into excess benefits.

Summing up, we cannot help repeating that taxing normal goods is a rather simple business, but that the taxation of luxury goods seems to be close to an art. While ministers of finance only rarely reveal artistic talents, they are always greedy for the money of their citizens, and thus it cannot to be ruled out that they may engage in this line too.[23] An explicit warning seems to be appropriate against such an artistic involvement: the design of luxury taxes as well as the complexity of their effects seems to be a highly delicate problem compared to taxing normal goods. The policy recommendations according to the criteria used here are often contradictory, and policy decisions may partly run high risks not only of missing their goals

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if policy-makers do not succeed in operating selectively, the maximization of the excess burden instead of excess benefits may result in the case of goods with an elasticity around p_t/X_t , whereas the minimization of the excess benefits is unproblematic in the envy-version with $\varepsilon \to 0$.

[22] Once again, a look at the excess benefit ratio should be permitted: the maximization of the excess benefit ratio in the utilitarian version poses no problem because around $\varepsilon = 1$ it is maximized from both sides. The minimization of the excess benefit ratio in the envy version succeeds at $\varepsilon = p_t/X_t$ as well as at $\varepsilon \to 0$; the latter case is unproblematic, but in the first case one runs the risk of a minimization of the excess burden ratio instead of minimizing the excess benefit ratio, and this is obviously counterproductive for envious minds.

[23] This paper clearly is a theoretical one, but two empirical facts may illustrate the point. Example Denmark: the greedy Danish Minister of Finance levies a luxury tax on cars because the Danes do not produce any. The result is that the companies exporting cars to Denmark have to cut their prices to keep them affordable in order to be present on the Danish market. That, however, confronts them with the problem of cheap re-imports to the car-making countries, which they try to counter by measures restricting competition. Example Italy: The greedy Italian Minister of Finance levies a luxury tax on cars with more than 2 liters cubic capacity; on the one hand, this has to be regarded mainly as a protective tax in favor of Fiat, but on the other hand it has involved a technology-steering effect that has prevented the establishment of Italian car-makers on the world market for upper class automobiles.

but of realizing the opposite of them. In a congress contribution, Gregory Mankiw (1996, 68) once mentioned Frank Fisher's "Iron Law of Non-Linear Econometrics", which reads: "Don't do it". For the taxation of luxury goods and as a warning to far too greedy ministers of finance the same law applies: don't do it!

References

Frank, Robert H. 1999. *Luxury Fever – Money and Happiness in an Era of Excess*. Princeton: Princeton University Press.

Haucap, Justus, 2001. Konsum und soziale Beziehungen. *Jahrbuch für Wirtschaftswissenschaften* 52: 243 – 263

Leibenstein, Harvey, 1950. Bandwagon, Snob, and Veblen Effects in the Theory of Consumers' Demand. *Quarterly Journal of Economics* 44: 183-207

Mankiw, N. Gregory, 1996. Comments and Discussion on: George A. Akerlof, William T. Dickens, George L. Perry. The Macroeconomics of Low Inflation. *Brookings Papers on Economic Activity* (1): 66-73

Veblen, Thorstein B. 1899. *The Theory of the Leisure Class.* New York: MacMillan Company

Bisher erschienen:

Diskussionspapiere der Fächergruppe Volkswirtschaftslehre

- Zimmermann, Klaus W. & Tobias Thomas, Patek Philippe, or the Art to Tax Luxuries, No. 13, (June 2003).
- Dewenter, Ralf, Estimating the Valuation of Advertising, No. 12 (June 2003).
- Otto, Alkis, Foreign Direct Investment, Production, and Welfare, No. 11 (June 2003).
- Dewenter, Ralf, The Economics of Media Markets, No. 10 (June 2003).
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- Haucap, Justus & Tobias Just, Not Guilty? Another Look at the Nature and Nurture of Economics Students, No. 8 (June 2003).
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- Bräuninger, Michael, A Note on Health Insurance and Growth, No. 6 (June 2003).
- Dewenter, Ralf, Media Markets with Habit Formation, No. 5 (June 2003).
- Haucap, Justus, The Economics of Mobile Telephone Regulation, No. 4 (June 2003).
- Josten, Stefan Dietrich & Achim Truger, Inequality, Politics, and Economic Growth. Three Critical Questions on Politico-Economic Models of Growth and Distribution, No. 3 (June 2003).
- Dewenter, Ralf, Rational Addiction to News?, No. 2 (June 2003).
- Kruse, Jörn, Regulierung der Terminierungsentgelte der deutschen Mobilfunknetze?, Nr. 1 (Juni 2003).

Frühere Diskussionsbeiträge zur Wirtschaftspolitik

- Bräuninger, Michael & Justus Haucap, Das Preis-Leistungs-Verhältnis ökonomischer Fachzeitschriften, Nr. 120 (2002), erschienen in: *Schmollers Jahrbuch* 123, 2003.
- Kruse, Jörn, Competition in Mobile Communications and the Allocation of Scarce Resources: The Case of UMTS, Nr. 119 (2002), erscheint in: Patrick Rey und Pierrre Buigues (Hg.), *European Telecommunications Policy*, Edward Elgar Publishing, 2003.
- Haucap, Justus & Jörn Kruse, Predatory Pricing in Liberalised Telecommunications Markets, Nr. 118 (2002).
- Kruse, Jörn, Pay-TV versus Free-TV: Ein Regulierungsproblem?, Nr. 117 (2002), erscheint in: Mike Friedrichsen (Hg.), *Kommerz - Kommunikation - Konsum. Zur Zukunft des Fernsehens in konvergierenden Märkten*, 2003.
- Kruse, Jörn, Regulierung der Verbindungsnetzbetreiberauswahl im Mobilfunk, Nr. 116 (2002), als Kurzform erschienen in: *Multimedia und Recht*, Januar 2003, S. 29-35.
- Haucap, Justus & Jörn Kruse, Verdrängungspreise auf liberalisierten Telekommunikationsmärkten, Nr. 115 (2002), erscheint in: *Perspektiven der Wirtschaftspolitik* 5, 2004.
- Haucap, Justus & Helmmar Schmidt, Kennzeichnungspflicht für genetisch veränderte Lebensmittel: Eine ökonomische Analyse, Nr. 114 (2002), erschienen in: *Zeitschrift für Wirtschaftspolitik* 53, 2002, S. 287-316.
- Kruse, Jörn & Jörn Quitzau, Zentralvermarktung der Fernsehrechte an der Fußball-Bundesliga, Nr. 113 (2002), erschienen in: *Zeitschrift für Betriebswirtschaft, Ergänzungsheft zur Sportökonomie*, 2002, S. 63-82.
- Kruse, Jörn & Justus Haucap, Zuviel Wettbewerb in der Telekommunikation? Anmerkungen zum zweiten Sondergutachten der Monopolkommission, Nr. 112 (2002), erschienen in: *Wirtschaftsdienst* 82, 2002, S. 92-98.
- Bräuninger, Michael & Justus Haucap, What Economists Think of Their Journals and How They Use Them: Reputation and Relevance of Economics Journals, Nr. 111 (2002), erschienen in *Kyklos* 56, 2003, S. 175-197.
- Haucap, Justus, Telephone Number Allocation: A Property Rights Approach, Nr 110 (2001), erschienen in: *European Journal of Law and Economics* 15, 2003, S. 91-109.
- Haucap, Justus & Roland Kirstein, Government Incentives when Pollution Permits are Durable Goods, Nr. 109 (2001), erschienen in: *Public Choice* 115, 2003, S. 163-183.
- Haucap, Justus, Konsum und soziale Beziehungen, Nr. 108 (2001), erschienen in: *Jahrbuch für Wirtschaftswissenschaften* 52, 2001, S. 243-263.
- Bräuninger, Michael & Justus Haucap, Was Ökonomen lesen und schätzen: Ergebnisse einer Umfrage, Nr. 107 (2000), erschienen in: *Perspektiven der Wirtschaftspolitik* 2, 2001, S.185-210.
- Haucap, Justus, Uwe Pauly & Christian Wey, Collective Wage Setting When Wages Are Generally Binding: An Antitrust Perspective, Nr. 106 (2000), erschienen in: *International Review of Law and Economics* 21, 2001, S. 287-307.

- Haucap, Justus, Selective Price Cuts and Uniform Pricing Rules in Network Industries, Nr. 105 (2000).
- Bräuninger, Michael, Unemployment Insurance, Wage Differentials and Unemployment, Nr. 104 (2000) erschienen in: *Finanzarchiv* 75, 2000, S. 485-501.
- Kruse, Jörn, Universaldienstlast etablierter Postunternehmen, Nr. 103 (2000) erschienen in: *Zeitschrift für Betriebswirtschaft*, Ergänzungsheft 3, 2002, S. 99-117.
- Kruse, Jörn, Sportveranstaltungen als Fernsehware, Nr. 102 (2000) erschienen in: Schellhaaß, Horst-Manfred (Hg.), *Sportveranstaltungen zwischen Liga- und Medien-Interessen*, Schorndorf 2000, S. 15-39.

Frühere Diskussionsbeiträge aus dem Institut für Theoretische Volkswirtschaftslehre

- Bräuninger, Michael, Social Capital and Regional Mobility, Nr. 4/2002.
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- Rösl, Gerhard, Die Umverteilung der Geldschöpfungsgewinne im Eurosystem: Das Earmarking-Verfahren seit dem 1.1.2002, Nr. 1/2002, als Kurzform erschienen in: *Wirtschaftsdienst* 82, 2002, S.352-356.
- Schniewindt, Sarah, Two-Way Competition in Local Telecommunication Networks, Nr. 2/2001.
- Reither, Franco, Optimal Monetary Policy when Output Persists: On the Equivalence of Optimal Control and Dynamic Programming, Nr. 1/2001.
- Schäfer, Wolf, MOEL-Wechselkursarrangements, Nr. 1/2000, erschienen in: Günther Engel & Peter Rühmann (Hg.): *Geldpolitik und Europäische Währungsunion*, Göttingen 2000, S.217-228.
- Heppke, Kirsten, On the Existence of the Credit Channel in Poland, Nr. 8/1999.
- Bräuninger, Michael, Unemployment and International Lending and Borrowing in an Overlapping Generations Model, Nr. 8/1999.
- Henning, Andreas & Wolfgang Greiner, Organknappheit im Transplantationswesen - Lösungsansätze aus ökonomischer Sicht, Nr. 7/1999.
- Chung, Un-Chan, East Asian Economic Crisis - What is and What Ought to be Done: The Case of Korea, Nr. 6/1999, erschienen in: *Research in Asian Economic Studies* 10, 2002, S. 93-121.
- Carlberg, Michael, Europäische Währungsunion: Der neue Policy Mix, Nr. 5/1999, erschienen in *Wirtschaftswissenschaftliches Studium (WiSt)* 29(1), 2000, S. 8-13.
- Carlberg, Michael, European Monetary Union: The New Macroeconomics, Nr. 4/1999, erschienen in: Gerhard Rübel (Hg.), *Real and Monetary Issues of International Economic Integration*, Berlin 2000, S. 155-175.
- Bräuninger, Michael und J.-P. Vidal, Private versus Financing of Education and Endogenous Growth, Nr. 3/1999, erschienen in: *Journal of Population Economics* 13, 2000, S. 387-401.

- Reither, Franco, A Monetary Policy Strategy for the European Central Bank, Nr. 2/1999 erschienen in: Rolf Caesar und Hans-Eckart Scharrer (Hg.), *European Economic and Monetary Union: Regional and Global Challenges*, Baden-Baden 2001, S. 213-226.
- Bräuninger, Michael, Wage Bargaining, Unemployment and Growth, Nr. 1/1999 erschienen in: *Journal of Institutional and Theoretical Economics* 156, 2000, S. 646-660.

Frühere Diskussionsbeiträge zur Finanzwissenschaft

- Josten, Stefan, Crime, Inequality, and Economic Growth. A Classical Argument for Distributional Equality, 2002, erscheint in: *International Tax and Public Finance,* 2003.
- Zimmermann, Klaus W. & Tobias Thomas, Öffentliche Güter, natürliche Monopole und die Grenze marktlicher Versorgung, 2002, erscheint in: *Wirtschaftswissenschaftliches Studium (WiSt)* 32, 2003.
- Holm-Müller, Karin & Klaus W. Zimmermann**,** Einige Anmerkungen zur Internalisierungsstrategie mit dem produktorientierten Konzept der Pigousteuer, 2002, erschienen in: *Zeitschrift für Umweltpolitik und Umweltrecht* 25, 2002, S. 415-420
- Josten, Stefan, Nationale Schuldenpolitik in der EWU, 2002, erschienen in: *Wirtschaftsdienst* 82, 2002, S. 219-225.
- Hackmann, Johannes, Der Sonderabgabenbezug nach dem Lebenspartnerschaftsergänzungsgesetz, 2002, erschienen in: *Wirtschaftsdienst*, 82, 2002, S. 241-248.
- Josten, Stefan, Das Theorem der Staatsschuldneutralität. Eine kritisch-systematische Rekonstruktion, 2001, erschienen in: *Jahrbuch für Wirtschaftswissenschaften* 53, 2002, S. 180-209.
- Zimmermann, Klaus W.**,** Komplikationen und Fallstricke in der Pigou-Analyse von Externalitäten, 2001, erschienen in: *Jahrbuch für Wirtschaftswissenschaften* 53, 2002, S. 245-267
- Josten, Stefan, National Debt in an Endogenous Growth Model, 2001, erschienen in: *Jahrbuch für Wirtschaftswissenschaften* 53, 2002, S. 107-123.
- Hackmann, Johannes, Vom Ehegattensplitting zum Partnerschaftssplitting?, 2001, erschienen in: Volker Arnold (Hg.), *Wirtschaftsethische Perspektiven VI*, Schriften des Vereins für Socialpolitik 228/VI, 2002, S. 189-222.
- Zimmermann, Klaus W. & Tobias Just, Politische Glaubwürdigkeit und der Euro: Eine verfassungsökonomische Perspektive, 2000, erschienen in: Fritz Söllner & Arno Wilfert (Hg.), *Die Zukunft des Steuer- und Sozialstaates*, Physica, 2001, S. 373-397.
- Josten, Stefan, National Debt, Borrowing Constraints, and Human Capital Accumulation in an Endogenous Growth Model, 2000, erschienen in: *FinanzArchiv* 58, 2001, S. 317-338.

- Zimmermann, Klaus W. & Tobias Just, The Euro and Political Credibility in Germany, 2000, erschienen in: *Challenge* 44, 2001, S. 102-120
- Josten, Stefan, Public Debt Policy in an Endogenous Growth Model of Perpetual Youth, 1999, erschienen in *FinanzArchiv* 57, 2000, S. 197-215.
- Zimmermann, Klaus W., Internalisierung als Nirwana-Kriterium der Umweltpolitik, 1999, erschienen in: Kilian Bizer, Bodo Linscheidt & Achim Truger (Hg.), *Staatshandeln im Umweltschutz. Perspektiven einer institutionellen Umweltökonomik*, Duncker & Humblot, 2000
- Hackmann, Johannes, Die unterlassene Besteuerung der Nutzungswerte selbstgenutzten Wohnungseigentums: Vergebene Reformpotentiale, 1999, erschienen in: R. Lüdeke, W. Scherf & W. Steden (Hg.), *Wirtschaftswissenschaft im Dienste der Verteilungs-, Geld- und Finanzpolitik*, Festschrift für A. Oberhauser, Berlin 2000, S. 387-412.
- Zimmermann, Klaus W. & Tobias Just**,** Interest Groups, Referenda, and the Political Process: On the Efficiency of Direct Democracy, 1999, erschienen in: *Constitutional Political Economy* 11, 2000, S. 147-163
- Josten, Stefan, Staatsverschuldung und Wirtschaftswachstum in einem Diamond-OLG-Modell mit AK-Technologie, 1999, erschienen in: *Jahrbuch für Wirtschaftswissenschaften* 51, 2000, S. 237-254.