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Tax complexity and fiscal illusion

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Abstract. By using the Hirschman–Herfindahl index (HHC) the traditional approach to the tax complexity hypothesis introduces a restriction into the fiscal illusion model which has no theoretical foundation. We analyse the existing framework of the tax complexity hypothesis in detail and propose to capture this complexity through a Hannah and Kay index. We extend the theoretical framework by considering the expected return on investment in information.

The empirical tests show that the HHC overestimates the importance of size inequalities between different taxes, while underestimating the impact of the number of taxes as a source of informational costs. The expected revenue hypothesis is not supported.

1. Introduction

Ever since the introduction of the concept of fiscal illusion, the complexity of the tax system has been considered as one of its most important sources.[1] By considering this complexity as a measure for the informational costs, the tax complexity hypothesis stresses the analogy between the problem of fiscal perception and a "traditional" investment decision. Higher informational costs discourage the individual taxpayer to inform himself. As such, tax complexity induces the existence of fiscal illusion and the resulting biased demand for – and provision of – public facilities.[2]

The existing literature on the tax complexity hypothesis is mainly empirical in nature. Theoretical aspects have only received limited attention. A first objective of this paper is therefore to analyse in detail the theoretical rationale behind the tax complexity hypothesis (Section 2). This allows us to address two major problems in this research domain. First, we deal with the omnipresent question of how to quantify the complexity of a given tax system as a measure for the informational costs (Section 3). In Section 4 we extend the existing theoretical model by taking into consideration the expected revenue which taxpayers associate with the decision to invest in information. The main findings of Sections 3 and 4 are tested using a dataset on the expenditures of 302 Flemish municipalities.

2. The tax complexity hypothesis: Theory

2.1. Introduction

Before answering the question to what extent tax complexity can affect public expenditures through the existence of fiscal illusion, one has to know what exactly is meant by the complexity of the tax system. This does not turn out to be an easy question. In the existing literature many partial answers to this question are given, often implicitly. First, it should be clear that tax complexity – as a source of fiscal illusion – is associated with the (mis-)perception of the fiscal burden, that is of the *amount* of taxes paid. As such, it should not be confused with the perception of the tax system or the legislation. For instance, "knowledge of the correct tax rate is not necessarily to be equated with a correct perception of the total tax payment" (Goetz, 1977: 179). More generally, the existence of complex rate structures or a wide variety of exemptions or tax expenditures not necessarily implies that it is hard for the taxpayer to perceive the amount of taxes paid.[3]

What factors then, influence the perception of the amount paid to the fisc? Generally speaking, tax complexity is seen as the result of two underlying determinants: the fragmentation of total tax revenue over different taxes and the visibility (of the revenue) of these individual taxes. Whereas tax fragmentation refers to a characteristic of the whole system, the degree of visibility is in first instance linked to the individual taxes that build up this system. Both elements will affect the costs for the taxpayer in his search for information.

2.2. Fragmentation

The fragmentation of the tax system, that is the extent to which total tax revenue is dispersed over different taxes, is seen as a first determinant of the complexity of a given tax system. The idea is that tax fragmentation refers to the dispersion of information on total tax revenue. The stronger this fragmentation, the more difficult it will be for the taxpayer to perceive the exact amount paid to the fisc. The idea of fragmentation leads – almost naturally – towards the use of concentration indexes (borrowed from industrial economics). In his seminal paper on this subject, Wagner (1976) introduced the use of the Hirschman–Herfindahl concentration index (HHC). This index gives the sum of squared relative shares of the individual taxes:

$$HHC = \sum_{i=1}^{N} t_i^2$$

where t_i is the relative share of tax i in total tax revenue (and N is the number of different taxes). The HHC is in fact an index of tax *simplicity*, lower values indicating more fragmented tax systems. The HHC takes the value of one when all tax receipts come from a single tax. It approaches zero to the extent that the tax system consists of a large number of small taxes.

By the fact that use has been made of concentration indexes to capture the fragmentation of total tax revenue, implicit hypotheses have been introduced into the theory of fiscal illusion. Indeed, the choice for a concentration index implies that the fragmentation idea is crystallized in terms of two dimensions of the tax system, namely the number of taxes and the size inequalities between them. As tax complexity is seen in terms of informational costs, the *number of taxes* influences these costs for the simple reason that the information is shattered over different taxes. The possible impact of *size inequalities* of the different taxes is far less obvious. The use of an HHC measure implies that the perception of the amount of taxes paid, can be seen as a weighted sum of the perceptions of individual taxes. These perceptions are supposed to be positively related to their relative share in total tax revenue. The question then is, why a tax that represents – say – 4 percent of total tax revenue should in general be less visible than a tax that represents 10 percent of tax receipts? Especially in a case where both taxes are identical in all other respects – included absolute size – and where the divergence in relative shares only refers to differences in the total amount of tax revenue raised, this hypothesis seems far from self-evident. The only justification to be found in the existing literature is given by Wagner (1976). To justify the fact that size inequalities are taken into account, he refers to the *process of abstraction*, which is "an integral element in the formation of perceptions" (Wagner, 1976: 52). This process of abstraction is one in which some information is included while other is ignored. In terms of the perception of total tax revenue: taxpayers only consider a subset of tax items. Given the fact that they have some rough idea[4] about the size or about the relative importance of different taxes, Wagner (1976: 53) argues that it is plausible that taxpayers will try to get information on those items (or as he calls it: "Fiscal Extraction Devices") which extract the largest amount of resources. A taxpayer who has exact information on a given number of taxes, will by definition perceive a larger proportion of his real tax burden when tax revenue is more concentrated (and given the number of different taxes, this means: more unequally distributed).

2.3. Visibility

The visibility of individual taxes depends mainly on the administrative process. The way in which a tax is collected can obscure the real amount paid in two

different ways. A first determinant is the fractionalization or *temporal dispersion* of tax payments. The collection of fractions of a tax bill at different points in time creates perception problems for the taxpayer as compared to a situation where only one single (larger) payment takes place. The information problem here is similar to that resulting from the fragmentation of total tax revenue over different taxes. Now however the problem is that information on a given tax is fragmented in time. A well-known example concerns the VAT: the almost permanent basis on which this tax is paid, substitutes for a single clear "confrontation" between taxpayer and fisc.

A second determinant of the degree of visibility of a given tax is its "*obtrusiveness*" (Wagner, 1976: 51): the way in which taxes are raised can be such that the taxpayer cannot help but be aware of the existence and amount of them. This obtrusiveness refers mainly to the implicit or explicit character of the collection process. If a tax bill is presented explicitly and in isolation to a taxpayer, the correct perception of the amount paid will be stimulated. In the VAT-example, the actual tax burden may be obscured because of the implicit way in which the tax is imposed (as a component of prices). This problem is also present when use is made of the withholding provision. In that case the taxpayer is not confronted with the tax. He is only reminded that a share of his income has already been taken (Wagner, 1976: 50). An analogous problem arises when – in a context of overlapping governments – taxes of different governmental entities are collected together. Under such a "pooling procedure," the taxpayer will have difficulties to impute the appropriate portion to the different governments involved (Goetz, 1977: 178). These three examples might result in a misperception of the amount of money that is being transferred to the government and as such they can distort the taxpayer-voter's preferences for public expenditures.

3. Informational costs: How to measure tax complexity?

As mentioned in Section 2, the existing literature on tax complexity and fiscal illusion relies on the use of concentration indexes to capture the informational costs of the fiscal investment decision. It is striking however that *all* authors choose for the Hirschman–Herfindahl index (HHC).[5] This unanimity is the more surprising when the large array of possible alternatives offered by industrial economics is considered.

Of course, the HHC fits well into the theoretical framework: the number of taxes is considered and by squaring the relative shares of the individual tax items, more weight is given to those taxes with relatively large receipts. As such, the HHC corresponds to the general idea of Wagner's "abstraction argument" concerning the impact of size inequalities on fiscal misperception. Still,

whatever the (theoretical) explanation given to the exact nature of this impact, it is hard to put forward a given relation between both determinants (number and size inequalities) that is based on theoretical grounds. This however is exactly what is being done by using the HHC in empirical research. In other words: the impact of the number of taxes on the one hand and of size inequalities between the different items on the other is theoretically plausible. However, by putting forward a given relationship between those two determinants, the choice of the HHC introduces a restriction into the model that has hardly any theoretical foundation and above all can be circumvented easily. To do this, we propose a more general approach in which the relative importance of the number of taxes on the one hand and size inequalities on the other can be determined empirically. For this, we use a model in which we capture the complexity of the tax system by a Hannah and Kay concentration index (Hannah and Kay, 1977). This index, which is a more general measure of concentration than the HHC can be written as:

$$HK(\alpha) = \left(\sum_{i=1}^{N} t_i^{\alpha} \right)^{(1/(1-\alpha))}$$

The selected α is a measure of the tradeoff between the importance given to the quantity of taxes and the attention for size inequalities among tax items. As a rule, high α's give more weight to the largest taxes in the distribution (Davies, Lyons et al., 1988: 83). A most interesting feature of this measure is that for α equal to 2, the HK becomes the reciprocal of the HHC! By manipulating α further, various other popular concentration indexes are obtained, each of which is characterized by a corresponding relationship between the number of taxes and the size inequalities (see annexe). For $\alpha = 0$, the HK index reflects the number of taxes. As such, HK(0) corresponds to the inverse of the so called *minimum concentration index*. When α reaches unity, the logarithm of HK reaches the well-known *entropy index*. Finally, for $\alpha = \infty$ HK becomes the reciprocal of CR_1. This index is a special case of the *concentration ratio* CR_x, which is the cumulative share of the largest x taxes.

From this discussion it is clear that by capturing the complexity of a tax system through a HK index and by manipulating the α parameter, different relative weights can be given to the number of taxes and to the size inequalities between the different taxes as components of tax fragmentation. This creates the opportunity to determine the relative importance of both elements on an empirical basis.

4. Return on investment in information

By looking at the tax complexity hypothesis in terms of information costs, the existing literature stresses the analogy between the perception problem and a

traditional investment decision. In that context, it is rather surprising that the traditional approach of the complexity phenomenon often focuses on the cost side of this decision only. The (expected) return which is inherent to any investment problem is left out of most analyses. To say that the "return side" is *totally* overlooked is not fully correct. When Pommerehne and Schneider (1978) study the impact of the political institutional setting on the existence of fiscal illusion, they start explicitly from the question "(...) of whether the individual taxpayer will have different incentives to be informed of his fiscal burden under different kinds of collective decision-making arrangements" (Pommerehne and Schneider, 1978: 383). The incentives under consideration are political: they refer to the voter's influence on budgetary policy through the democratic process of voting. This "political" return on investment in information will be addressed further.

By disregarding the return side the existing literature can put forward an unambiguous relation between tax complexity and fiscal misperception: increases in complexity are associated with higher informational costs. As such they result in a "reduction in the amount of exploration undertaken (which in turn) means that the accuracy of a taxpayer's perception of the price of public output will lessen. The accuracy of a person's perception of the cost of government, then, will vary inversely with the complexity of the revenue structure" (Wagner, 1976: 52). No explicit attention is given to the expected return from the "exploration decision". In general, this expected return is positively related to the existing tax burden. More specifically, the possible gains from investment in (fiscal) information can take three different forms:

1. First, these gains can be *political* in nature. In that case, they refer to the involvement of the taxpayer in the existing collective decision making process: knowledge of the actual tax burden can allow to exploit the democratic opportunities that are offered through the possibility to take part in elections and referenda. Apart from helping the individual in the process of vote-allocation, the acquisition of fiscal information may help him to form opinions with which he can influence government policy formation during the period between elections (Downs, 1957: 238). The latter argument refers to the fact that a vote-maximizing government will "bias" its policy toward the preferences of informed voters (provided that the government is aware of their preferences).

   As mentioned above, the role of fiscal (mis-)perception in the process of vote-allocation is present in Pommerehne and Schneider (1978). Under any democratic decision making process, the "quality" of vote-allocation can be expected to be positively related to the information available. However, to the extent that voter-participation is more direct in nature, the expected

return from information to the individual voter will rise. As such, it is hypothesized by Pommerehne and Schneider – and supported by their empirical findings – that voters will have relatively stronger incentives to inform themselves in direct democracies as compared to representative democracies. The absence of referenda is an additional "source" of fiscal illusion. By taking into consideration the political dimension of the existence of fiscal illusion, Pommerehne and Schneider in fact build further on the Downsian argument that "(i)n general, it is irrational to be politically well-informed because the low returns from data simply do not justify their cost in time and other scarce resources" (Downs, 1957: 259). Inaccurate perception in the collective decision process is "rational" to the extent that the potential influence of the (informed) voter is by definition smaller in collective as opposed to private decisions. Still, the fact that this influence is smaller does not mean that it is inexistent.

As a rule, we can expect that the level of taxation gives an indication of the importance of the democratic opportunities to be exploited by the individual citizen. Put differently: to the extent that the actual level of taxation is higher, the potential loss from "misallocating" one's vote will be larger.[6] Therefore a citizen will be more inclined to inform himself on his true tax burden to the extent that this is perceived to be large. As pointed out earlier, this "primary" perception will be based on the amount of free information available (see note 4). Consequently, at a given level of tax complexity, voters will be better informed and fiscal illusion will diminish as the tax burden is larger.

2. The return on investment in fiscal information can be *locational* in nature. By diminishing the level of uncertainty on his optimal location, the fact that a taxpayer is informed on fiscal matters can have a welfare enhancing effect. Indeed, in a context of local governments where foot-voting is possible, knowledge of the actual tax burden will help to evaluate the different locational alternatives.[7]

   Again, the level of taxation can indicate the importance of the (fiscal) locational opportunities to be exploited by the individual citizen. If local taxation is negligible, so will be the utility gain from moving towards an alternative location. If on the other hand the local tax burden is large, the potential gains from investing in information will – *ceteris paribus* – be more important. As such, a taxpayer will again be more inclined to inform himself on fiscal matters. A given level of tax complexity, will therefore be associated with less fiscal misperception to the extent that the tax burden is larger.

3. Finally, knowledge of his actual tax burden, will allow the individual to evaluate possible *gains from* tax *evasion* and/or *avoidance*. In the process

> of deciding on whether or not to evade (avoid) taxes, information on the amount of taxes paid is of crucial importance. This amount is indeed a primary determinant of the potential gains from these activities. The level of taxation reflects how much there is to be avoided and/or evaded. As the expected revenue of these activities rises, it becomes more worthwhile for the individual taxpayer to inform himself. As such, at a given level of complexity we will meet better informed citizens (and thus: less fiscal illusion) to the extent that the tax burden is larger. Note that in this context, tax complexity also has a potentially important dynamic impact: as tax complexity rises (at a given level of taxation), the perception of the tax burden – the "tax awareness" – will diminish. To the extent that tax evasion is seen as a reaction to the perceived (excessive) tax burden, a rise in complexity will lower evasive activities (Schneider, 1993: 9).

Whatever the precise nature of the return from information may be, it is clear from the above examples that this return will be positively related to the amount of taxes paid: as this amount rises, political as well as locational surpluses to be captured will become more important ceteris paribus. So will the potential gains from tax avoidance and/or evasion. As such, we expect that the amount of taxes paid (or more precisely: the "free information" on this amount) will serve as an incentive for taxpayer-voters to inform themselves. As a result – at a given level of tax complexity – they will be better informed and fiscal illusion will diminish.

5. Empirical results

5.1. Introduction

To determine the "optimal" index of tax fragmentation and to test the return on investment hypothesis, we start from the "extended" median voter model as applied in Heyndels and Smolders (1994). In this model demand for public facilities is determined by the median voter's income and his *perceived* tax price. Different sources of fiscal illusion introduce a possible divergence between this perceived price and the voter's *actual* tax price. This model is briefly commented in Section 5.2, and tested in Section 5.3 on a dataset of 302 Flemish municipalities (accounts 1990).[8] Taxation is an important source of income for Flemish municipalities. It constitutes about 40 percent of their current income, the remaining coming from (un)conditional grants. That the problem of tax fragmentation might have substantial practical relevance can be deduced from the fact that Flemish municipalities raise up to 48 different taxes (the average number being 19).

5.2. Model

The demand function used for empirical estimation differs from that in (Heyndels and Smolders, 1994) in that it is specified in per capita terms (Pommerehne, 1978), and that demographic variables are included. Most important, a Hannah and Kay index replaces the HHC-index as a measure of tax complexity. The demand function can thus be written as:

$$\ln\frac{E}{INH} = w_0 + w_1.\ln\,(INH.T) + w_2.\ln\,Y + w_3.\ln\,FLY + w_4.\ln\,TEL + [w_5 + w_6.D_2 + w_7.D_3 + w_8.D_4].\ln\,HK\,(\alpha) + w_9.\ln\,PCOLD + w_{10}.\ln\,DENS + w_{11}.\ln\,CHPOP$$

where E are current municipal expenditures in 1990. INH reflects the number of inhabitants, T is the median voter's tax share and Y is his income. Demographic explanatory variables give the percentage of the population that is older than 60 (PCOLD), population density (DENS) and the relative change in the number of inhabitants over the last ten years (CHPOP).

FLY, TEL and HK(α) capture different sources of fiscal illusion. The FLY-variable is defined as the relative share of unconditional grants in the median voter's income (Courant et al., 1979). The elasticity of tax revenue is captured by the TEL-variable. TEL is defined as the share of the local income tax in the revenue from local income and local property taxation (Oates, 1975).[9] To capture the fragmentation of total tax revenue over different taxes, we use a Hannah and Kay concentration index (HK(α)). As made clear in Section 3, the relative importance of the number of taxes and of the size inequalities between taxes varies with the chosen value of α. To test for the return on investment hypothesis, the population was subdivided into quartiles according to their level of per capita taxation. Dummy variables (D_2, D_3 and D_4) are used to categorize the municipalities ($D_i = 1$ for municipalities that belong to the i-th quartile, else $D_i = 0$).

w_1 and w_2 measure price and income elasticity of demand (we expect $w_1 < 0$ and $w_2 > 0$). A larger share of grants and a more elastic tax revenue are associated with more fiscal illusion. In both instances, the tax price will be underestimated (as part of the tax burden is not perceived): we expect w_3 and w_4 to be positive.

To the extent that tax fragmentation leads to a systematic underestimation of the tax price, a higher complexity of the tax system will be associated with a larger public budget. We therefore expect $w_5 > 0$. However, the expected return from investing in fiscal information will be positively related with total tax revenue. Therefore we expect – ceteris paribus – that fiscal illusion will

be less substantial in the "higher" quartiles. In other words, w_6, w_7 and w_8 are expected to be negative. Moreover, we expect that $w_6 > w_7 > w_8$. Finally, to the extent that fiscal illusion remains present, also in the "high tax municipalities" ($w_5 + w_8$) will be positive.

In order to determine the relative importance of the "number" and the "size" component in tax complexity, we perform OLS-estimations of the model for values of α ranging from 0.0 to 2.5 (step 0.1).[10] These estimations were optimized with respect to the value of the coefficient of determination.

5.3. Results

Regression results are summarized in Table 1. The OLS-estimations give the best fit at an α-value of 0.9. Use of a Hirschman–Herfindahl index imposes the restriction that α equals 2. An F-test – comparing the explanatory power of both regressions – shows that the null hypothesis that the restriction ($\alpha = 2.0$) is "true", is rejected at a 5% level of significance.[11] In other words: the restriction on α which is imposed when a Hirschman–Herfindahl index is used to capture tax complexity *does* have a significant influence on the regression results in the context of Flemish municipal expenditures. This suggests that the use of the Hirschman–Herfindahl index ($\alpha = 2$) would attach too much weight to the impact of size inequalities as a determinant of local expenditures. Conversely, the importance of the number of taxes would be underestimated. Put differently: the impact of the information on the fiscal burden being dispersed over different taxes is relatively underestimated, while the impact of Wagner's "abstraction"-argument is relatively overestimated. Still, the results suggest that both determinants (number of taxes and size inequalities) are relevant. This can also be seen from the regressions for $\alpha = 0$ and for $\alpha = \infty$.[12]

Our results do not support the expected return hypothesis: the responsiveness from local expenditures to changes in the tax complexity is *larger* in municipalities where the tax burden is high. A 10 percent change in the Hannah and Kay index is associated with a 3.7 percent change in local expenditures in municipalities in the first quartile (for HK(0.9)). This responsiveness does not differ significantly in the second and third quartile. In the group of municipalities with the largest tax burdens, a rise in tax complexity by 10 percent leads to a rise in expenditures of 5.5 percent. This reaction is significantly stronger than in the other municipalities. Thus, whereas from our theoretical argumentation we would expect that taxpayers in quartile four would invest more in fiscal information and by that would reduce the level of fiscal illusion, our empirical results suggest the contrary.[13]

As far as the other fiscal illusion variables are concerned, the results are analogous to those found in Heyndels and Smolders (1994): coefficients of

Table 1. Determinants of per capita expenditures (1990)

	C	INH*T	Y	FLY	TEL	HK(α)	D_1*HK(α)	D_2*HK(α)	D_3*HK(α)	PCOLD	DENS	CHPOP	R^2(adj)
α = 0.0	9.41	−0.47	0.26	0.29	−0.72	0.11	0.02	0.03	0.08	−0.58	−0.02	−0.49	55.49%
	(2.03)	(−5.19)	(0.70)	(5.52)	(−3.51)	(2.81)	(1.38)	(2.24)	(4.59)	(−4.98)	(−1.02)	(−2.06)	
α = 0.9	2.02	−0.48	0.82	0.27	−0.62	0.37	0.03	0.04	0.13	−0.43	−0.008	−0.61	59.31%
	(0.44)	(−5.47)	(2.26)	(5.43)	(−3.17)	(5.03)	(1.27)	(1.41)	(3.69)	(−3.71)	(−0.38)	(−2.66)	
α = 2.0	2.19	−0.56	0.85	0.33	−0.53	0.47	0.04	0.05	0.19	−0.45	0.001	−0.55	58.41%
	(0.46)	(−6.34)	(2.29)	(6.59)	(−2.64)	(4.37)	(1.31)	(1.46)	(3.88)	(−3.91)	(0.01)	(−2.36)	
α = ∞	9.00	−0.58	0.36	0.35	−0.68	0.13	0.07	0.12	0.34	−0.60	0.007	−0.40	54.18%
	(1.87)	(−6.03)	(0.94)	(6.61)	(−3.19)	(0.98)	(1.55)	(2.27)	(4.87)	(−5.15)	(0.30)	(−1.66)	

n = 302, t-values between brackets.

FLY and TEL are significantly different from zero but the coefficient of the tax elasticity did not have the expected sign.

Population density does not affect local expenditures significantly. The percentage of inhabitants over 60 years of age and the change in the total population on the other hand exert a significant – and negative – influence on per capita expenditures. A structural growth (decline) in the local population is associated with a lower (higher) level of public expenditures. This might be explained by the existence of political disequilibrium or inertia: expanding (contracting) expenditures to meet the needs of a growing (declining) population takes time (Bergstrom and Goodman, 1973). The presence of "older" people is associated with lower expenditures. This results contradicts the life cycle hypothesis (Bergstrom and Goodman, 1973: 290). This might have two different "illusion-inspired" – though admittedly *ad hoc* – explanations. First, older (retired) people may be better informed on local taxation because they have lower informational costs. More specifically, it is plausible that their opportunity costs of time invested in searching for information is lower. Second, it might be that a lower (inter-jurisdictional) mobility of older people implies that they have had more time to accumulate information on local tax policy than the average (or median) citizen.

6. Conclusion

The existing literature on tax complexity and fiscal illusion focuses on the impact of fragmentation on the taxpayer's perception of his actual fiscal burden. To the extent that a given tax revenue is obtained from a larger *number* of taxes, the amount paid to the fisc is harder to perceive. On the other hand, if *size inequalities* between the (revenues of) different taxes are substantial, a given number of taxes will correspond with a larger fraction of the total amount paid. To the extent that in the "process of abstraction" the largest taxes are taken into consideration, fiscal misperception will be negatively related to these size inequalities.

Whereas the possible impact of both the number of taxes and of the size inequalities between those taxes is theoretically plausible, the existing theoretical framework does not allow to put forward a given relationship between both determinants. Their relative weights can best be determined empirically, by manipulating the α parameter in the Hannah and Kay concentration index.

Our empirical results show that per capita expenditures of Flemish municipalities can be explained by a model in which tax complexity is measured by a Hannah and Kay index with an α-value of 0.9. Use of the Hirschman-Herfindahl index would overestimate the relative importance of the size inequalities, while underestimating the impact of the number of taxes.

Tax complexity is traditionally seen as a measure for the informational costs associated with an accurate perception of the amount of taxes paid. Whereas the existing literature focuses mainly on the "cost side" of the investment decision involved, we consider the expected revenue that a taxpayer can associate with this decision. Political and locational surpluses as well as potential gains from tax evasion and/or avoidance are positively related to the amount of taxes paid. Therefore, we use this amount as a proxy for the expected revenue. We test for the hypothesis that this expected revenue will serve as an incentive for taxpayers to invest in information, which will reduce fiscal illusion. Our empirical results however do not support this hypothesis.

Notes

1. Other sources of fiscal illusion refer to the relative importance of non-tax revenues (grants, debt) or to the specific nature of the tax system itself. This system can induce fiscal illusion through its overall income elasticity or through its "unclear" incidence. For a review article see Oates (1988).
2. Wagner (1976) and Oates (1988) provided an alternative explanation for the negative relationship between tax complexity and public expenditures. Oates resumed Wagner's idea that, in order to keep in line with tax rates in other (neighbouring) municipalities and as such avoiding a potential political cost, jurisdictions will try to diversify their revenue. No empirical investigation on this so called "revenue diversification hypothesis" has been published yet. As Wagner mentions, both interpretations are not incompatible in the case where the government uses tax diversification as an instrument in order to create fiscal illusion (Wagner, 1976: 58).
3. The existence of complex rate structure, many exemptions, ... may not be of major interest in the context of a taxpayer looking for information on the *amount* of taxes paid. It can however be relevant in other instances which also imply taxpayers' investment in (fiscal) information. Indeed, if a taxpayer informs himself on fiscal matters in order to detect possibilities to avoid or to evade taxes, such "technical" information might be of great importance. To the extent that tax systems are organised in a more complex way, the cost of investment in information for the taxpayer will be larger. As such, a tax system's complexity might serve as an "entry barrier" into activities of tax evasion or avoidance. This idea can be found in Schneider (1993).
4. To follow Downs' terminology, the "rough idea" about the size or the relative importance of different taxes can be seen as "free" information, that is "(...) information which is given to a citizen without any transferable cost. The only cost he must bear consists of the time he spends absorbing and utilizing it" (Downs, 1957: 222). As in Downs' model, this free information acts as a floor for the rational calculations which a taxpayer makes before deciding whether to obtain extra information or not.
5. In a footnote, Pommerehne and Schneider (1978: 390) mention the use of the entropy measure. They however, give no theoretical (or empirical) justification for this alternative. For their empirical analysis they only give the HHC-results "as both indicators lead to very similar results" (Pommerehne and Schneider, 1978: 390).
6. To stay within the Downsian argumentation, in a two party context, the amount of taxes to be allocated can be seen as a major component of the so-called party differential "i.e., the difference between the utility income he actually received in period t and the one he would have received if the opposition had been in power" (Downs, 1957: 40).

7. As such – parallel to the Downsian party differential mentioned above – the level of taxation forms an integral component of the so called locational surplus: "Locational surplus is a differential concept which measures the additional utility derived by an individual from a particular location as against the next best alternative location" (Grewal, 1988: 169).
8. As Pommerehne (1978) stresses, the choice for a median voter framework has severe limitations in a context of representative democracies as they exist in the Flemish municipalities. Certainly when elections are "far away" (which is the case in our 1990-dataset for the previous elections at the municipal level took place in 1988 and next elections will take place in 1994) the deviation of median voter's preferences might be important. Therefore, we tried to introduce institutional elements into our model. This however did not give satisfactory results: we found no significant influence on per capita expenditures from either the ideological preferences of the local incumbents or from the existence of coalitions.
9. This measure is a crude approximation of the elasticity of the municipalities' tax revenue. We tried to improve the elasticity measure by weighing the shares of income and property tax revenues with the corresponding long term growth rates of their bases (as both local taxes are surcharges on taxes of higher level governments, these "bases" are in fact the revenue from the federal income tax and the regional property tax). This however, did not change our results significantly.
10. For $\alpha = 1$, the HK(α) was approximated by its limiting value e^E, where E denotes the entropy measure (see Appendix).
11. The Sum of Squared Errors equals 10.3409 in the unrestricted regression ($\alpha = 0.9$) and 10.5692 in the restricted regression ($\alpha = 2.0$). This gives a test statistic of 6.40 which is larger than the theoretical $F_{1,290}$-value at a 5% level of significance (which equals 3.84).
12. Although the regression results for $\alpha = 0.9$ and $\alpha = 2.0$ in table 1 differ significantly with respect to their overall explanatory power, it should be noticed that use of the HHC does not qualitatively change the interpretations of the other coefficients. Such changes *do* occur for $\alpha = 0$ and for $\alpha = \infty$ (notably for the income elasticity).
13. A possible explanation for this unexpected result would be a non-linear relationship between tax complexity and fiscal misperception: as the level of tax complexity rises, one could expect that the marginal misperception becomes more important. This possibility was tested for by including a supplementary dummy variable in the complexity measure. This dummy was put to one if tax complexity exceeded the median level, and to zero in all other cases. This test however did not yield a satisfactory result: the coefficient of the "new" dummy did not differ significantly from zero.

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Appendix

Relation between the Hannah and Kay index and other concentration indexes

Hannah and Kay index (HK(α))	$HK(\alpha) = \left(\sum_{i=1}^{N} t_i^{\alpha}\right)^{(1/(1-\alpha))}$
Minimal concentration index (C_{min})	$C_{min} = \frac{1}{N}$
Entropy index (E)	$E = -\sum_{i=1}^{N} t_i \log t_i$
Hirschman-Herfindahl index (HHC)	$HHC = \sum_{i=1}^{N} t_i^2$
Concentration index CR_x	$CR_x = \sum_{i=1}^{x} t_i$