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August 1996

UNE Working Papers in Economics No. 28

Editor **Brian Dollery**

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ISSN 1321-9081 **ISBN 1 86389 357 1**

THE REVENUE COMPLEXITY HYPOTHESIS: ISSUES OF VARIABLE SPECIFICATION

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In a pioneering paper on the revenue-complexity hypothesis, Heyndels and Smolders (1995) demonstrate that the conventional employment of the Hirschman-Herfindal index (HHC) in the empirical analysis of fiscal illusion introduces an arbitrary restriction without theoretical foundation. They propose instead the more general Hannah and Kay index (HK). In this paper we extend this approach to 1991 data drawn from forty six local government areas in Tasmania, Australia. Our results are in broad agreement with those produced by Heyndels and Smolders using local government data from Flanders, Belgium. We find that the HHC may involve sizeable misspecification bias and our results provide further support for the use of HK instead of HHC.

Introduction

Revenue complexity, sometimes termed tax complexity, has long been identified as one of five potential sources of fiscal illusion.[1] The essence of the revenue-complexity hypothesis has been described by Wallace Oates (1988, p. 69) as "... the more complicated the revenue system, the more difficult it is for the taxpayer to determine the tax-price of public outputs - and the more likely it is that he will underestimate the tax-burden associated with public programs". Tax complexity itself is viewed as arising from two separate influences; namely, the dispersion or fragmentation of total tax revenue over different types of taxation, and the visibility of individual taxes. The empirical analysis of the revenue-complexity hypothesis naturally required some measure or proxy for the degree of tax complexity associated with a given fiscal jurisdiction. Since Wagner's (1976) seminal study employed the Hirschman-Herfindahl concentration index (HHC) borrowed from industrial organisation to represent tax complexity, all subsequent empirical investigations of the revenue-complexity hypothesis have also used the HHC.[2]

In a pathbreaking paper Heyndels and Smolders (1995) examine the theoretical arguments underlying the tax complexity hypothesis and in particular question the appropriateness of employing the HHC as a suitable measure of revenue complexity. The essence of their objections to the HHC is as follows (Heyndels and Smolders, 1995, pp. 130-131):

> As such, the HHC corresponds to the general ideal of Wagner's "abstraction argument" concerning the impact of size inequalities on fiscal misconception. 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.

In place of the conventional HHC, Heyndels and Smolders (1995) propose a more general approach to the measurement of tax complexity which enables the relative importance of the number of taxes and size inequalities between different taxes to be determined empirically. This is accomplished by means of a Hannah and Kay concentration index (HK), which is a more general measure of concentration than the HHC.

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In order to evaluate the statistical impact of substituting HK for HHC, Heyndels and Smolders (1995) employed a modified version of their model developed in Heyndels and Smolders (1994) using 1990 data drawn from 302 municipalities in the Region of Flanders in Belgium. After examining the results of the estimation procedure, Heyndels and Smolders (1995, p. 138) draw the following conclusion:

> 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.

In this paper we seek to extend the novel approach to the issue of tax complexity developed by Heyndels and Smolders (1995), and subject it to empirical investigation using cross-sectional variables taken from forty six local government areas in the state of Tasmania, Australia, in 1991. Our results suggest that the use of HHC simplicity indexes in the empirical estimation of the revenue complexity hypothesis may involve sizeable misspecification bias. This accords with the central findings of Heyndels and Smolders (1995).

The paper itself is divided into four main areas. The second section provides a brief synopsis of the characteristics of the HHC and its relationship to the HK. The third section deals with the empirical methodology employed in the paper, and the results are discussed in the fourth section. The paper ends with some concluding remarks.

Measuring Tax Complexity

The well-known HHC is given by the following formula:

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

where T_i represents the proportion of total tax revenue in a given fiscal jurisdiction derived from tax i and N represents the number of different taxes. In effect, the HHC considers all taxes but, by squaring the relative shares of individual taxes, gives more weight to those individual taxes which generate relatively more tax revenue. In the limiting base, if only one tax raised all tax revenue, then HHC would take the value of unity. Alternatively, if an infinitely large number of taxes generated total tax revenue, then the value of the HHC would approach zero. Accordingly, the HHC is a measure of the simplicity of a tax regime, with lower values of the index indicating more fragmentation. The revenue complexity hypothesis is thus predicted on a negative coefficient for the HHC.

A more general way of determining the relative importance of the number of taxes in comparison with revenue raised by individual taxes suggested by Heyndels and Smolders (1995) is the HK. The HK can be written as :

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

where α represents a measure of the relative weighting attached to the number of different taxes and the size inequalities between different taxes. Heyndels and Smolders (1995, p. 131) outline a number of characteristics of the HK which serve to highlight its generality. For instance, when α is set equal to 2, the HK becomes the reciprocal of the HHC. Similarly, when α = 0, the HK corresponds to the inverse of the minimum concentration index; when α = 1, the logarithm of HK becomes the entropy index; and when $\alpha = \infty$, HK represents the reciprocal of the concentration index. Accordingly, Heyndels and Smolders (1995, p. 131) observe that:

> It is clear that 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.

Empirical Methodology

The conventional approach to the analysis of fiscal illusion at the local level follows the Bergstrom and Goodman (1973) demand function for public goods which hypothesises that the level of expenditure conforms to the median voter model. Modelling fiscal illusion in this manner is not only consistent with literature on the nature of the demand function for public goods, like Bergstrom and Goodman (1973) and Romer and Rosenthal (1979), but also accords with most previous empirical work on fiscal illusion, such as Wagner (1976), Munley and Greene (1978), and Grossman (1990). Moreover, this methodology has dominated the empirical literature on fiscal illusion at the local level (Wagner, 1976; Pommerehne and Schneider, 1978; Munley and Greene, 1978; DiLorenzo, 1982; Grossman, 1990; Heyndels and Smolders; 1994; Dollery and Worthington, 1995). Furthermore, a log-linear formulation of this per capital approach has been widely employed (see, for example, Baker (1983), Misiolek and Elder (1988), Heyndels and Smolders (1995), and Dollery and Worthington (1995)).

Although the hypotheses examined in the present context are primarily concerned with the revenue complexity hypothesis, some consideration is also given to the renter illusion hypothesis since neglecting it would lead to misspecification (Martinez-Vasquez, 1983). Table 1 outlines the models and variables employed. In essence, various cross-sectional variables drawn from a samples of forty six local government areas in Tasmania, Australia are employed.

The dependent variable in Table 1 is local government expenditure per capital (EXP). However, while this is the only broad measure of public good provision employed in past empirical studies (Wagner, 1976; Baker, 1983; Grossman, 1990; Heyndels and Smolders, 1994), at least two caveats should be attached to its use, both of which stem from the fact that the use of expenditure data implies that output is measured by the value of inputs. Firstly, the employment of expenditure as a proxy for public good provision necessarily assumes that production functions are uniform across jurisdictions. Hamilton (1983) has shown that community "inputs" may significantly modify the output of public goods, and accordingly misspecification of output may be a problem. And secondly, EXP is based on constant returns to scale. Notwithstanding these caveats, and given the absence of more suitable dependent variables, we use EXP.

TABLE 1.
Models and variables for local expenditure and revenue complexity.

Model			
$lnEXP_i = \beta_0 + \beta_1 lnAREA_i + \beta_2 lnROAD_i + \beta_3 lnTAX_i + \beta_4 lnOWN_i + \beta_5 lnINC_i + \beta_7 ln065_i + \beta_8 lnH_i(\alpha) + u_i$			
Variables	**Details**	**Data Source**	**Coefficient**
EXP	Total local per capita expenditure in the i-th municipality ($)	*Government Finance Statistics: Tasmania 1990/1991* (ABS) Cat. 5501.6	
AREA	Rateable area per capita of the i-th municipalilty (km^2)	*Tasmanian Inquiry into the Modernisation of Local Government* (LGAB), 1991.	+
ROAD	Road length per capita of the i-th municipality (km)	*Tasmanian Inquiry into the Modernisation of Local Government* (LGAB), 1991.	+
TAX	Median voter tax-price of the i-th municipality ($).	*Tasmanian Inquiry into the Modernisation of Local Government* (LGAB) *Tasmanian Government Gazette* Vol. 275, 1991. *Government Finance Statistics: Tasmania 1990/1991* (ABS), Cat. 5501.6	-
OWN	Proportion of homes owned in the i-th municipality	*Local Government Areas: Tasmania 1991 Census* (ABS) Cat. 2790.6	-
INC	Median voter income in the i-th municipality ($)	*Local Government Areas: Tasmania 1991 Census* (ABS), Cat. 2790.6	+
O65	Proportion of population over 65 in the i-th municipality	*Local Government Areas: Tasmania 1991 Census* (ABS), Cat. 2790.6	+
HK ($0 < \alpha < \infty$)	Hannah and Kay revenue concentration index for the i-th municipality.	*Government Finance Statistics: Tasmania 1990/1991* (ABS), Cat. 5501.6	+

Table 1 also contains the set of independent socioeconomic variables required by the Bergstrom and Goodman 91973) demand function approach. These variables seek to capture salient characteristics of the local community that are likely to influence the demand for public good expenditure. Both rateable area per capita (AREA) and rateable area roads per capita (ROAD) are expected to exhibit a positive coefficient with respect to expenditure (Wagner, 1976; Munley and Greene, 1978), particularly since local governments in Australia typically devote considerable resources to these purposes. The proportion of the population over sixty five years of age (065) is expected to yield a positive sign since a higher proportion of elderly people should be associated with a greater consumption of public goods (Bergstrom and Goodman, 1973). Median voter income (INC) is included on the presumption that public goods in general may be defined as normal goods, and on the assumption that it captures unmeasurable and unintentionally excluded income-correlated characteristics like educational attainment, employment, family stability, and "... general success in society" (Hamilton, 1983, p. 347). The expected coefficient for INC is positive. Despite the widespread employment of an income variable in the empirical literature, at least two lines of criticism have been directed at its use. Firstly, it is argued the employment of median measures of income may serve to obscure the real income elasticity of demand for the public good, since there is no reason to believe that elasticities are constant across a particular income class for any jurisdiction (Romer and Rosenthal, 1979; Wildasin, 1988). And secondly, the median voter model assumes that the median taxpayer receives the median income which amounts to assuming income is monotonic. If this is not the case, then the equation may be misspecified (Romer and Rosenthal, 1979). However, Wildasin (1988, p. 375) argues that at the "macro-level" (ie. full local expenditure) the impact of any median voter model constraints and assumed monotonicity will be minimal, given "...the error in the income elasticity ... is not likely to be very large."

The final independent socioeconomc variable is the tax-price (TAX). In common with virtually all public good demand function studies since Bergstrom and Goodman (1973), the tax-price of the median voter should *ex ante* inversely determine the level of provision of the public good, given the substitution from the public to the private good. However, two problems usually surround the selection of a suitable tax-price. The first is the conflict between mean and median tax-prices. Most work has employed the median voter approach, since the mean tax-price has been shown to involve substantial multicollinearity (Munley and Greene, 1978; Pommerehne, 1978) and to violate the assumptions of the primary model of collective choice (Romer and Rosenthal, 1979, p. 151). The second conflict revolves around the question of whether the relevant median tax-price is the median voter's tax times the marginal cost of public good provision (Yinger, 1982), the median voter's tax times the marginal cost of public good provision (Yinger, 1982), the median voter's tax-share (Bergstrom and Goodman 1973) or an equal share of the additional provision of the public good (Borcherding, 1985). Work by Hayes (1989) has argued that the median voter's tax share is the most appropriate, both theoretically and empirically. After examining all three approaches, Hayes (1989, p. 273) found that the median voter's tax share displayed "small biases" for most socioeconomic variables and provided better estimates given "... a possible misspecified production function," as against the alternative approaches which exhibited "inconsistent parameters". Hayes (1989, p. 273) observed that the results indicated "... statistical support for the median voter's tax-share approach". Accordingly, this approach is employed in the present context.

In addition to these socioeconomic variables, past empirical approaches to the analysis of fiscal illusion have included various illusionary factors. Variables selected in this regard depend critically on the powers and institutional processes of particular levels of government. The local level of government expenditure in Australia, as exemplified in our Tasmanian sample, provides a suitable milieu for the analysis of both the revenue-complexity hypotheses and the renter illusion hypothesis. As detailed earlier, the HHC has traditionally been used to test the tax complexity hypothesis. However, following Heyndels and Smolders (1995) pioneering paper, we employ the HK measure, with the weighting variable α ranging from zero to infinity, step 0.1. Moreover, in common with Heyndels and Smolders (1995), the relative importance of the "number" and "size" components of revenue complexity is assessed by varying the value of α, and optimising with respect to the value of the coefficient of determination. Secondly, the renter illusion hypothesis argues that "... other things being equal, jurisdictions with a relatively large fraction of renters tend to spend more per capita on local public service" (Oates, 1988, p. 72). Such an observation is based on apparent failure of renters to understand the link between the level of local services demanded and the level of rent paid (Oats, 1988). The variable used to evaluate the renter illusion hypothesis (OWN) is the proportion of homes owned or being purchased in the municipality (Bergstrom and Goodman, 1973; Goetz, 1977; Martinez-Vazquez, 1983). The renter illusion hypothesis would *a priori* indicate a negative coefficient since as the proportion of homes owned or being purchased increases, the level of expenditure would fall.

Results

Regression results for the models and hypotheses developed in Table 1 are presented in Table 2. In general, the results are analogous to those found utilising a similar data set in Dollery and Worthington (1995). All socioeconomic and fiscal variables adhere to their hypothesised coefficients and would appear to support the considerable evidence that already exists "... suggesting that the composition of the community - that is, the characteristics of the residents themselves - plays a central role in determining levels of important public outputs" (Schwab and Oats, 1991, p. 217). Tests for homoskedasticity fail to reject the null hypothesis and we may conclude heteroskedasticity is not present. The Ramsay RESET specification test rejects the null hypothesis of no functional misspecification, whilst a test for model selection favours the log-linear form over an alternative linear formulation. The results supporting the former specification sustain the findings of Baker (1983), Misiolek and Elder (1988), Grossman (1990), Heyndels and Smolders (1994; 1995) and Dollery and Worthington (1995) in the econometric suitability of the log-linear over a linear form for demand estimation.

Most importantly in terms of the present study, the results in Table 2 suggest that the use of the HHC in analysis of this kind may involve sizeable misspecification bias. More particularly, the best fit of the model is optimised at an α value of 1.1.[3] Utilising an F-test Wald proceedure along the lines of Heyndels and Smolders (1995), the null hypothesis of the α = 2 restriction is rejected against the unrestricted α = 1.1 alternative.

This would tend to suggest that when the "artificial" restriction of α = 2 is imposed by the HHC, the size inequalities of different revenue extraction devices are emphasised over the number of such devices. This accords with Heyndels and Smolders (1995, p. 136) observation that "... the impact of the information of the fiscal burden being dispersed over different taxes is relatively underestimated, while the impact of Wagner's 'abstraction'-argument is relatively overestimated". Moreover, and once again in agreement with Heyndels and Smolders (1995), the testing of a range of α values finds that consideration of the number and size of fiscal extraction devices is required in the empirical analysis of revenue complexity. However, the results would suggest, at least in the Australian institutional milieu, that the emphasis on the size inequalities of revenue devices (as represented by the HHC) is likely to encompass a lesser degree of misspecification than that posited by the use of a proxy variable which might emphasise the number of such devices.

TABLE 2.

Results of regression estimation for local expenditure and revenue complexity.

	CONS.	AREA	ROAD	TAX	OWN	INC	O65	HK	R^2(adj)
$\alpha = 0.0$	3.0143	-0.1566	0.4345	-0.1939	-1.0299	0.1790	0.3485	0.1229	0.4820
	(4.6204)	(0.0780)	(0.1343)	(0.1338)	(0.3084)	(0.4335)	(0.1567)	(0.6400)	
$\alpha = 1.1$	1.7213	-0.1771	0.4557	-0.2447	-1.1302	0.3099	0.3911	0.6184	0.5290
	(4.0607)	(0.0748)	(0.1275)	(0.1261)	(0.2892)	(0.4052)	(0.1385)	(0.3159)	
$\alpha = 2.0$	1.9516	-0.1631	0.4210	-0.2143	-1.0828	0.2174	0.3899	0.4825	0.5195
	(4.0954)	(0.0748)	(0.1283)	(0.1249)	(0.2886)	(0.4070)	(0.1404)	(0.2785)	
$\alpha = \infty$	2.4927	-0.1487	0.4018	-0.1825	-1.0275	0.2119	0.3681	0.2843	0.4918
	(4.2515)	(0.0771)	(0.1359)	(0.1275)	(0.2944)	(0.4178)	(0.1456)	(0.3249)	

Values in parentheses are the corresponding standard errors.

Concluding Remarks

Various benefits flow from the present study. Our results support the contention advanced by Heyndels and Smolders (1995) that the widespread use of the HHC may result in misspecification bias by providing corroborative econometric evidence drawn from an alternative institutional milieu and a different data set. There is thus now compelling evidence to suggest that the previous unqualified acceptance of the HHC as a satisfactory measure of revenue simplicity was misplaced. Moreover, our results also provide support for the use of the HK instead of the HHC.

However, several caveats must be emphasised. In the first instance, whilst use of the HHC does lead to misspecification, the level of such misspecification is not great, at least relative to larger potential problems, such as overall model misspecification. Secondly, it should be noted that local governments in Australia are much more legislatively restricted in their revenue-raising activities than their Belgian counterparts, and in particular are obliged to rely on far fewer fiscal extraction devices. It is thus reasonable to assume any HHC bias against the numbers of taxes is muted in the Australian context. Finally, and perhaps most importantly, despite its undoubted advantages Heyndels and Smolders (1995) seminal use of the HK does raise questions concerning "data mining". The selection of an optimising value for α serves to maximise the *ex post* empirical results at the expense of sound *a priori* reasoning. The importance of a solid theoretical basis for the analysis of fiscal illusion need hardly be stressed.

Notes

1. Other hypothesised sources of fiscal illusion are revenue elasticity, the flypaper effect, renter illusion, and debt illusion.
2. It should be noted that Pommerehne and Schneider (1978) did raise the possibility of employing an entropy measure instead of the HHC, but did not report the empirical results flowing from its use, save to point out that it generated similar results to the conventional HHC. Similarly, Clotfelter (1976) included the relative importance of direct taxes and reliance on user charges in addition to an HHC comprising nine categories of taxation. For a detailed discussion of empirical work in the Wagner (1976) tradition see Dollery and Worthington (1996).
3. By way of comparison, Heyndels and Smolders (1955, p. 136) found best fit at an α value of 0.9.

References

Baker, S. H. (1983). The determinants of median voter tax liability: An empirical test of the fiscal illusion hypothesis. *Public Finance Quarterly* 11 (1), pp. 95-108.

Bergstrom, T.C. and Goodman, R.P. (1973). Private demands for public goods. *American Economic Review* 63 (2), pp. 280-296.

Breeden, C.H. and Hunter, W.J. (1985). Tax revenue and tax structure. *Public Finance Quarterly* 13, pp. 216-224.

DiLorenzo, T.J. (1982b). Utility profits, fiscal illusion and local public expenditures. *Public Choice* 38 (3), pp. 243-252.

Dollery, B.E. and Worthington, A.C. (1995). An empirical test of fiscal illusion and local expenditure in Australia. *Federalism Research Centre Discussion Papers* 26, Canberra: Australian National University.

_______. (1996). The empirical analysis of fiscal illusion. *Journal of Economic Surveys* (forthcoming).

Dougan, W.R. and Kenyon, D.A. (1988). Pressure groups and public expenditures: The flypaper effect reconsidered. *Economic Inquiry* 26 (1), pp. 159-170.

Feenburg, D.R. and Rosen, H.S. (1987). Tax structure and public sector growth. *Journal of Public Economics* 32 (2) pp. 185-201.

Goetz, C.J. (1977). Fiscal illusion in state and local finance. In T.E Borcherding (ed). *Budgets and bureaucrats: The sources of government growth* . Durham, Duke University Press.

Grossman, P.J. (1990). The impact of federal and state grants on local government spending: A test of the fiscal illusion hypothesis. *Public Finance Quarterly* 18 (3), pp. 313-327.

Hamilton, B.W. (1983). The flypaper effect and other anomalies. *Journal of Public Economics* 22 (3), pp. 347-361.

Heyndels, B. and Smolders, C. (1994). Fiscal illusion at the local level: Empirical evidence for the Flemish municipalities. *Public Choice* 80 (3-4), pp. 325-338.

_______. (1995). Tax complexity and fiscal illusion. *Public Choice* 85 (1-2), pp. 127-141.

Martinez-Vazquez, J. (1983). Renter's illusion or savvy? *Public Finance Quarterly* 11 (2), pp. 237-247.

Misolek, W.S. and Elder, H.W. (1988). Tax structure and the size of government: An empirical analysis of the fiscal illusion and fiscal stress arguments. *Public Choice* 57 (3), pp. 233-245.

Munley, V.G. and Greene, K.V. (1978). Fiscal illusion, the nature of public goods and equation specification. *Public Choice* 33 (1), pp. 95-100.

Oates, W.E.(1988). On the nature and measurement of fiscal illusion: A survey. In G. Brennan, B.S. Grewel and P. Groenewegen (Ed), *Taxation and fiscal federalism: Essays in honour of Russell Mathews*, Sydney, ANU Press.

Pommerehne and Schneider, F. (1978). Fiscal illusion, political institutions and local public spending. *Kyklos* 31(3), pp. 381-408.

Romer, T. and Rosenthal, H. (1979). The elusive median voter. *Journal of Public Economics* 12 (1), pp. 143-170.

Schwab, R.M. and Oates, W.E. 1991. Community composition and the provision of local public goods: A Normative Analysis. *Journal of Public Economics* 44, pp. 217-237.

Wagner, R.E. (1976). Revenue structure, fiscal illusion and budgetary choice. *Public Choice* 25 (1), pp. 45-61.

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