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FEDERAL EXPENDITURE AND FISCAL ILLUSION: AN AUSTRALIAN TEST OF THE FLYPAPER HYPOTHESIS

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Despite the fact that there are strong a priori grounds for presuming that the intergovernmental grants characteristic of fiscal federalism in Australia may generate fiscal illusion, no empirical effort has been directed at this line of inquiry. The present article seeks to go at least some way towards remedying this deficiency by evaluating the flypaper variant of the fiscal illusion hypothesis using a time series analysis of Australian Commonwealth expenditures for 1981 to 1992. The results of these estimations provide some tentative empirical support for the existence of a flypaper effect on public expenditure in Australia for the period under review.

The literature on fiscal federalism has repeatedly identified the absence of close links between revenue-raising and expenditure as the worst economic feature of Australian federalism.[1] The resulting vertical imbalance has left states heavily dependent on financial grants from the federal government, and has been blamed for various ills, not least a lack of accountability, allocative inefficiencies, and excessive reliance on economically inefficient taxes. It is thus surprising that the potential impact of fiscal illusion on state expenditure has been overlooked, especially since one variant of this general hypothesis holds that financial grants between fiscal jurisdictions will affect public expenditure in recipient jurisdictions. This specific type of fiscal illusion, known as the flypaper effect, forms the subject matter of this article.

EMPIRICAL ANALYSIS OF THE FLYPAPER EFFECT

The flypaper effect refers to the hypothesized ability of lump-sum grants to increase public expenditure by more than an equivalent increase in income from other sources. The term "flypaper effect" has been attributed by Louise Marshall to the observation that "money sticks where it hits".[2] Intergovernmental grants are thought to progressively raise the costs of inquiry into the recipient government's fiscal parameters, and consequently result in a higher level of expenditure than would have been the case in the absence of such grants. Developed by Paul Courant, Edward Gramlich and Daniel Rubinfeld,[3] and Wallace Oates[4], the argument holds that budget-maximizing politicians and bureaucrats use lump-sum grant revenues to expand public expenditure rather than return these revenues to taxpayers, either directly via rebates or indirectly through reduced taxes. Oates has postulated that this is accomplished by fostering the illusion that not only are actual average tax rates falling, but the marginal taxprice(s) of public goods are also lower.[5] As a result, the electorate may be willing to support a higher level of spending than would have been the case had the fiscal parameters been assessed accurately.

Three general approaches have been pursued in the empirical analysis of the flypaper effect. First, some researchers have included intergovernmental grants as one of many potential sources of fiscal illusion in regression exercises, and have found that grants are indeed an important determinant in the level of public good expenditure.[6]

Second, some writers such as Courant, Gramlich and Rubinfeld[7] and Oates[8] argue that grants reduce the average price of public goods, and that voters base their decisions on this price rather than on the actual marginal taxprice. Both Philip Grossman[9] and Marshall[10] represent recent examples of this empirical approach to the flypaper effect. Grossman posited that the degree of illusion caused by grants was a function of the level of indirectness. A federal grant, for example, would be more indirect or remote than a state grant in terms of local government finance, and as a result have a greater effect on the level of local expenditures. Grossman regressed various socioeconomic variables and categories of grants, both federal and state, conditional and unconditional, against expenditures for local government areas.[11] The results vindicated earlier studies in supporting the stimulative effects of grants, as well as Grossman's own hypothesis that "federal unconditional grants generate, at the minimum, approximately twice the increase in local expenditures as do state unconditional grants".[12] In a slightly different approach, Marshall used an exogenous illusion variable, tax windfalls, to analyze the flypaper illusionary hypothesis. Using a set of socioeconomic indicators (including the tax windfall) and a level of state expenditures, Marshall found results consistent with "the absence of any systematic effect of the tax windfalls upon the level of state expenditure".[13]

Third, Stanley Winer[14] and Robert Logan[15] argue that intergovernmental grants may induce voters to believe that their tax burden is being transferred to other fiscal jurisdictions. Winer began his study by observing that "there is an obvious temptation for politicians to foster the belief that the cost of public services will fall disproportionately on someone else."[16] In so doing, he provided the rationale for the analysis of a federal system in which spending and taxation decisions are separated, and may therefore have a systematic and biased effect on the level of expenditures.[17] Utilising Canadian provincial data, Winer reasoned that since federal taxation is levied nationally, federal grants-in-aid may induce a belief among a recipient province's voters that public services are being financed by non-residents. Consequently grants, and especially unconditional grants, reduce the perceived taxprice of provincial public goods and may well bias expenditures upward. This may be the case even if it is not possible to shift the taxation burden externally. As shown in Table 1, Winer's analysis regressed provincial income, federal grants and interprovincial grants against net provincial expenditures. He also included dummies for the different categories of recipient and donor provinces. Winer found that the results indicated "that the separation created by the grant system did reduce perceived taxprices and increase expenditures" and that the "impact elasticity of grants with respect to expenditure for the poor Atlantic provinces (recipient) is about twice as large as that for the rich provinces (donor)".[18]

(Table 1 about here)

Logan[19], and later David Hammes and Douglas Wills[20] modified Winer's[21] "partial equilibrium" approach by incorporating the effect of fiscal illusion on the grantor governments taxprice as well as that of the recipient. Logan based such an analysis on the fact that although voters were subject to incomplete information, they were still rational, and that they were faced with the perception that federal taxes were rising but services were not, and that state taxes were falling but services were not. From this, he surmised that the contrasting effects of misperceived taxprices would mean an upward bias of recipient expenditures, and a downward bias of donor expenditures exclusive of grants. Table 1 shows that Logan regressed per capita measures of income, federal aid, state expenditure and unemployment against per capita federal non-aid expenditure for a U.S. national time-series. The results indicated that a negative relationship did indeed exist between the level of federal expenditures on aid, and the level of federal non-aid expenditures: proof that modification of taxprices occurred at the donor level.[22] Such results inferred *per se* that tax prices were changed in the opposite direction for recipient expenditures, which supports the fiscal illusion hypothesis.[23] Hammes and Wills used an identical analysis for Canadian data and arrived at a similar conclusion.[24]

Despite empirical support for the flypaper effect, several alternative hypotheses have been developed. Thomas Romer and Harold Rosenthal argue that where the public budgetary agenda is dominated by political agents, the outcome may be determined by threat tactics.[25] In this manner, an upward bias in expenditures need not infer any systematic illusion such as the flypaper effect. William Dougan and Daphne Kenyon explain the flypaper effect as the result of lobbying by local pressure groups.[26] As a result the stimulative effect of grants need not be the outcome of a widespread taxprice illusion but rather the alteration of the relative wealth positions of various pressure groups. Oates has drawn on both Romer and Rosenthal and Dougan and Kenyon to argue that normal political budgetary processes may fulfil the theoretical role of fiscal illusion in biasing expenditures upwards, and that the stimulative effect of grants is incorrectly attributed to the flypaper illusion.[27]

MODELS AND HYPOTHESES

As we have seen, much previous empirical analysis of the flypaper effect has focused on the effects of federal transfers on recipient jurisdictional expenditures. This approach accepts the basic proposition underlying the flypaper effect that intergovernmental grants lower the perceived taxprice of recipient expenditures.[28] Moreover, Logan's "dual-illusion hypothesis" holds that a similar, but reversed, illusion will affect voters' perceptions of grantor expenditures.[29] Within a grantor/recipient model, increases in grants will lower the perceived price of recipient expenditures, but will increase the price of grantor expenditures, and therefore make federal expenditures more expensive. Accordingly, "when a government unit increases its level of intergovernmental grant disbursements, the demand for its services falls".[30] In general, a reduction in grantor "own" expenditures as a result of modifications in the perceived prices of grantor and recipient expenditures should offer alternative *prima facie* evidence of fiscal illusion.[31]

Table 2 shows the models and variables used for analyzing the effect of fiscal illusion on federal expenditures. The reduced form expenditure equations are adapted from Logan[32] and Hammes and Wills[33], and will be evaluated in both (1) linear and (2) log-linear forms. In common with the two previous approaches, regression analysis is used to evaluate the significance of time-series modifications in perceived prices on non-grant expenditure.

(Table 2 about here)

Such an approach is not without criticism. As Logan has noted "it is a very simple framework for describing expenditure determination in a federal system ... the model can be regarded as a simple expositional tool for a first attempt at analysing grants in a more general context".[34] In particular, the model employed identifies only that a modification in grantor prices has occurred, not the source of this modification. Given that the flypaper hypothesis

states that illusion exists only if a transfer of income by the federal system to the median voter has not occurred, the model is unable to differentiate between rational, informed actions and those exhibiting illusionary behavior. At best "it may be fruitful to analyze general equilibrium grant effects with other models of grantor/recipient expenditure determination".[35]

The dependent variable is real per capita federal non-grant expenditures (Eg). Expenditure is an imperfect proxy for actual public good output, although it has been accepted in the absence of a more suitable measure.[36] The level of expenditure net of grants is used, given that the flypaper effect hypothesis predicts that non-grant federal expenditures will fall, even though total expenditures may well increase.

The first composite independent variable (1/Pg')Y represents the fraction of income directed to grantor government expenditure under the perceived price of grantor services (Pg'). Since Pg' is not directly observable, a proxy used by Logan[37] and Hammes and Wills[38] is the ratio of federal grants to federal direct (non-grant) expenditures. Given that "grantor aid lowers the perceived price of recipient government expenditures and raises the perceived price of grantor government expenditures ... the coefficient on income falls ... as the perceived relative price changes encourage voters to spend a larger fraction of income on recipient government expenditures".[39]

The second variable (Pr'/Pg') represents the perceived relative prices of grantor (federal) and recipient (state/municipality) expenditures. In order to calculate this measure, a proxy for Pr' has also been derived, being the ratio of total federal grants to total state and municipal expenditures.[40] The coefficient on the measure (Pr'/Pg') should be negative, indicating that as the perceived price of recipient expenditure falls relative to the perceived price of grantor expenditures, federal non-grant expenditures will fall.

The next variable is (1/Pg'), which is the relative importance of federal grants in terms of total federal expenditure, direct and indirect. As this measure increases, the concentration of disbursements upon grants should further contract expenditures of the recipient government.

Finally, Logan[41] and Hammes and Wills[42] have supported the inclusion of an institutional constraint designed to measure automatic variations in grantor expenditures. This has been proxied by the unemployment rate (U) given that there are likely to be "automatic variations in federal government expenditures during times of higher unemployment".[43] As an alternative, Logan used both unemployment and a qualitative variable for war (for periods when the U.S. was engaged in expensive foreign conflicts) for these unobservable institutional constraints. The expected coefficient on unemployment when regressed against federal non-grant expenditures should be positive.[44]

RESULTS

The model of federal expenditure and fiscal illusion in Table 2 allowed for the analysis of the dual hypothesis of the flypaper effect. In this approach, the grant system provides a distortion of the taxprice of the public good for both the recipient and donor, so that the relevant perceived taxprice of the public good falls and increases respectively. Moreover, evidence of a decrease in donor (federal) non-grant expenditures as a result of an increase in the tax price of federal expenditures would provide *prima facie* evidence of fiscal illusion at the level of the recipient (state). The results of the time-series analysis of Australian Commonwealth expenditures 1981-1982 presented in Table 3, correspond directly to the linear and log-linear models presented in Table 2.

(Table 3 Here)

Model 1 in Table 3 details the results of a linear regression of four composite independent variables on the dependent variable of real per capita non-aid grantor expenditures. The coefficient for the variable (1/Pg')Y, which represents the fraction of income directed to grantor expenditures, is positive and significant, conforming to *a priori* expectations. The coefficient for the second variable (Pr'/Pg'), representing the perceived relative price of grantor (federal) to recipient (state) expenditures, is also significant and conforms to the expected sign. The third variable's coefficient representing the relative importance of the grant role in the federal structure (1/Pg') also corresponds to the *a priori* sign and level of significance. Finally, the coefficient for the institutional constraint U (unemployment) is positive and significant, indicating that an increase in institutional obligations is associated with an increase in federal non-grant expenditure. The coefficients obtained correspond with the Canadian study of Hammes and Wills which supported the fiscal illusion hypothesis, but run counter to the U.S. evidence of Logan.[45] However, it has been argued that to some extent the Logan results are also supportive of fiscal illusion, the divergence in implications coming from "certain institutional differences which may change the interpretation placed upon the similar numerical results".[46]

In terms of the econometric suitability of the model, the DW statistic (2.14812) lies above the inconclusive range (0.339-1.913), indicating the absence of autocorrelated errors. Additional tests for autocorrelation, the Lagrange multiplier and Box-Pierce-Ljung methods, also support this finding. However, a Ramsay RESET model-specification test indicates that the linear model is functionally misspecified, similar to the procedure and results observed by Logan and Hammes and Wills.

In accordance with the above, and the studies of Logan and Hammes and Wills, a log-linear specification was employed in Model 2. The signs on the coefficients are unaltered, as

are the levels of significance. This accords with earlier work showing that "the estimated coefficients for the alternative were found to be significant (and virtually identical to the estimated coefficients [in the linear model])".[47] The DW statistic (2.3278) once again fails to reject the null hypothesis of no autocorrelation, similarly for the alternative tests. However, the Ramsey RESET specification tests fail to reject the null hypothesis of the model being correctly specified, and we may conclude that the log-linear form is functionally superior to that of Model 1. A test employed to select between linear and log-linear formulations also supports this notion. These results confirm those of Logan where "the nonlinear specification ... does seem to do a better job of explaining the data. Both rounds of the test indicate a strong preference for this model", and are stronger than Hammes and Wills ambiguous outcome.[48]

The methodology employed, and the results obtained in the "dual-illusion" hypothesis above are consistent with the U.S. findings of Logan and the Canadian study of Hammes and Wills. In these studies, "federal non-aid direct expenditure [is] inversely correlated with federal grant aid to the provincial and municipal governments" as a result of modifications in the perceived relative prices of grantor and recipient expenditures.[49] By itself this would appear to lend support for the distortionary effect of grants at the grantor level, and thereby the fiscal illusion hypothesis of the flypaper effect. However, as noted previously, the limitations of the model are readily apparent, and it is "a very simple framework ... a simple expositional tool for a first attempt at analysing the effects of grants in a more general context".

CONCLUSION

To the best of our knowledge, the present article represents the first attempt at the empirical analysis of fiscal illusion in Australia caused by the existence of intergovernmental grants between the states and the federal government . The results from the estimation procedures employed provide some support for the existence of the flypaper effect in Australia. However, given the inherent limitations in the model underlying these estimations, the results obtained should be treated with caution. Further empirical work on the flypaper effect in the Australian constitutional milieu is necessary to confirm this tentative finding.

TABLE 1
Summary of Major Studies of the Flypaper Effect

Author[a]	Data[b]	Estimation technique[c]	Dependent Variable	Independent Variables[d]	Major Findings
Winer	10 Canadian provinces, pooled time-series, cross-sectional. (panel) 1952/53 - 1969/70	TSLS	Net provincial expenditure	Per capita income (+ lagged income), *federal grants* (+ *lagged grants), grants to other provinces* (+ lagged other grants), dummies for population and provincial groups (donor and recipient)	Expenditure separation reduces perceived tax prices and increases expenditures. Elasticity with respect to grants higher in recipient provinces.
Logan	US national Time-series 1947-1983	OLS (linear and non-linear)	Per capita federal direct not-aid expenditure	*Per capita income, per capita total federal aid to state and local expenditure, per capital total state and local expenditure, unemployment rate, dummy for war.*	Study of fiscal illusion on grantor government. Grants expected to reduce perceived price of recipient government goods and raise price of grantor government goods leading to a fall in non-aid expenditure at grantor level. Support of "flypaper" effect at grantor level.
Hammes and Wills	Canadian national Time series 1962-1984	OLS (log-linear and non-linear)	Real per capital federal non-aid expenditures Real per capita recipient government expenditures	*Perceived price of grantor (federal) expenditures, per capita national income, perceived price of recipient (provincial and local) expenditures.* *Perceived price of grantor expenditures, per capita national income, perceived price of recipient expenditures.*	Results similar to that of Logan in the modification of public good prices at grantor and recipient level. Support for hypothesis of "flypaper effect".
Marshall	US states Cross-sectional 1986	TSLS	Expenditure per capita	Per capita income, estimated per capita tax windfall, per capita intergovernmental revenue, *price of public goods (employee salaries), population, state share of final expenditure on public goods*, urban population, density.	Windfall revenue positive though insignificant in the effect on expenditure in line with competitive pressures limiting the effect of fiscal illusion.
Grossman	Virginian localities Cross-sectional 1982 and 1983	TSLS	Three expenditure categories; education, public safety and general administration	*Federal + state unconditional grants, state unconditional grants, federal + state categorical grants, median household income*, tax price (local) share, *percentage urban population,* percentage black	Unconditional grants are positive and significant in increasing the level of expenditure

a See, in the order in which they appear, Winer, "Some Evidence on the Effect of Spending"; Logan, "Fiscal Illusion and Grantor Government"; Hammes and Wills, "Fiscal Illusion and Grantor Government in Canada"; Marshall, "Fiscal Illusion in Public Finance", and Marshall, "New Evidence on Fiscal Illusion"; Grossman, "The Impact of Federal and State Grants".

b Singular dates represent cross-sectional studies, intervals time-series. Where two dates are given, different years for some cross-sectional variables have been used.

[c] OLS/TSLS - Ordinary Least Squares and Two-Stage Least Squares respectively
[d] Italicised independent variables indicate significant values at 90 percent or more.

TABLE 2
Models and Variables for Federal Expenditure and Fiscal Illusion

Method			
Time-series analysis of Australian Commonwealth expenditures 1981-1992			
Models			
(1) $Eg_t = \beta_0 + \beta_1 (1/Pg')Y_t + \beta_2(Pr'/Pg')_t + \beta_3(1/Pg')_t + \beta_4 U + u_t$ **(2)** $\ln Eg_t = \ln\delta_0 + \ln\delta_1 (1/Pg')Y_t + \ln\delta_2(Pr'/Pg')_t + \ln\delta_3(1/Pg')_t + \ln\delta_4 U + v_t$			
Variables	**Details**	**Data Source(s)**	**Expected Sign**
Eg	Real per capita federal direct (non-grant) expenditures in the t-th period.	*Australian National Accounts: National Income, Expenditure and Product 1981-1992* (ABS) Cat. 5204.0 *Australian National Accounts: State Accounts 1981-1992* (ABS) Cat. 5220.0	
Pg'	Perceived price of grantor (federal) expenditures in the t-th period.	*Australian National Accounts: State Accounts 1981-1992* (ABS) Cat. 5220.0	-
Y	Real per capita national income in the t-th period.	*Australian National Accounts: National Income, Expenditure and Product 1981-1992* (ABS) Cat. 5204.0	+
Pr'	Perceived price of recipient (state and local) government expenditures in the t-th period.	*Australian National Accounts: State Accounts 1981-1992* (ABS) Cat. 5220.0	+
Rr	Real per capita recipient (state and local) government expenditures in the t-th period.	*Australian National Accounts: State Accounts 1981-1992* (ABS) Cat. 5220.0	+
U	Unemployment rate as a proxy for institutional constraints in the t-th period.	*Australian Year Book 1989, 1990, 1991, 1992* (ABS) Cat. 1301.0	+
(1/Pg')Y	Fraction of income directed to grantor government expenditures	As for above components	-
(Pr'/Pg')	Relative perception of grantor and recipient public good prices in the t-th period.	As for above components	-
(1/Pg')	Relative importance of federal grants in total federal expenditure in the t-th period.	As for above components.	-

TABLE 3
Results of Regression Estimations for Federal Expenditure and Fiscal Illusion

Variable	Model 1	Model 2
CONSTANT	0.012374*** (0.00182)	-21.503*** (2.5875)
(1/Pg')Y	0.222E-02*** (0.39301E-07)	1.5893*** (0.24510)
(Pr'/Pg')	-0.739E-02*** (0.1147E-02)	-1.7724*** (0.29833)
(1/Pg')	-0.604E-02*** (0.9075E-03)	-2.2219*** (0.29017)
U	0.4569E-04** (0.21358E-02)	0.11077** (-0.038323)
ESS	0.40744E-07	0.22582E-02
R2	0.9785	0.9829
R2 adjusted	0.9662	0.9732
DWSTAT	2.14812	**2.32728**
FPE	0.8245E-08	**0.45701E+03**
LOG AIC	-18.668	**-7.7448**
LOG SC	-18.465	**-7.5427**
GCV	0.9978E-08	**0.55302E-03**
HQ	0.7249E-08	**0.40179E-03**
RICE	0.2037E-07	**0.11291E-02**
SHIBATA	0.6224E-08	**0.34500E-03**
SC	0.9561E-08	**0.52995E-03**
AIC	0.7812E-08	**0.43300E-03**

Values in parentheses are the corresponding standard errors. Asterisk(s) represent the level of significance; * - 90 percent, ** - 95 percent and *** - 99 percent. Bold diagnostic test denotes the model that is "best" for the criterion. Diagnostic tests may only be valid for unrestricted OLS regressions.

[1] See, for example, Cliff Walsh, "Federalism Australian Style: Towards Some New Perspectives", *Taxation and Fiscal Federalism: Essays in Honour of Russell Matthews*, eds. Geoffery Brennan, Bhajan Grewal and Peter Groenewegen (Sydney: Australian National University Press, 1988), pp. 222-239.

[2] Louise Marshall, "Fiscal Illusion in Public Finance: A Theoretical and Empirical Study" (Ph.D. Diss., University of Maryland, 1989), p. 4.

[3] Paul Courant, Edward Gramlich and Daniel Rubinfeld, "The Stimulative Effects of Intergovernmental Grants: Or Why Money Sticks Where It Hits", *Fiscal Federalism and Grants-in-Aid*, eds. Peter Mieszkowski and William Oakland (Washington, D.C.: the Urban Institute, 1979), pp. 5-21.

[4] Wallace E. Oates, "Lump-sum Intergovernmental Grants have Price Effects", *Fiscal Federalism and Grants-in-Aid*, eds. Peter Mieszkowski and William Oakland (Washington, D.C.: the Urban Institute, 1979), pp. 23-30.

[5] Wallace E. Oates, "On the Nature and Measurement of Fiscal Illusion: A Survey", *Taxation and Fiscal Federalism: Essays in Honour of Russell Matthews*, eds. Geoffery Brennan, Bhajan Grewal and Peter Groenewegen (Sydney: Australian National University Press, 1988), pp. 65-85.

[6] For examples of this literature see, for instance, Wallace E. Oates, "Automatic Increases in Tax Revenues: The Effect on the Size of the Public Budget", *Financing the New Federalism: Revenue Sharing, Conditional Grants and Taxation*, ed. Wallace E. Oates (Baltimore: Johns Hopkins University Press, 1975), pp. 139-160; Charles Goetz, "Fiscal Illusion in State and Local Finance", *Budgets and Bureaucrats: The Sources of Government Growth*, ed. Thomas E. Borcherding (Durham: Duke University Press, 1977), 176-187; Vincent G. Munley and Kenneth V. Greene, "Fiscal Illusion, The Nature of Public Goods and Equation Specification", *Public Choice* 33 (No. 1 1978): 95-100; Eleanor D. Craig and A. James Heins, "The Effect of Tax Elasticity on Spending" *Public Choice* 35 (No. 3 1980): 267-275; Thomas J. DiLorenzo, "Tax Elasticity and the Growth of Local Public Expenditure", *Public Finance Quarterly* 10 (July 1982): 243-252; and Charles H. Breeden and William J. Hunter, "Tax Revenue and Tax Structure", *Public Finance Quarterly* 13 (April 1985): 216-224.

[7] Cournat et. al., "The Stimulative Effects of Intergovernmental Grants".

[8] Oates, "Lump-sum Intergovernmental Grants".

[9] Philip J. Grossman, "The Impact of Federal and State Grants on Local Government Spending: A Test of the Fiscal Illusion Hypothesis", *Public Finance Quarterly* 18 (July 1990): 313-327.

[10] Louise Marshall, "New Evidence on Fiscal Illusion: The 1986 Tax Windfalls", *American Economic Review* 81 (December 1991): 1336-1345.

[11] Grossman, "The Impact of Federal and State Grants".

[12] Ibid., 325. Not surprisingly, the effect of unconditional grants, which require no matching funds from recipients, are more stimulative than tied (ie. matching) grants.

[13] Marshall, "New Evidence on Fiscal Illusion", 1343. She also argued that the use of intergovernmental grants are prone to simultaneous equation bias in the sense that grant-matching is prevalent at the recipient level. The testing of such a hypothesis has usually called for the employment of the two-stage least squares approach. Marshall reasoned that the tax windfalls in her study were the "unintended by-product of national legislative action, independent of the states decisions concerning the level of expenditure" and were thus free of simultaneity. Ibid., 1336. A central proposition of Marshall's thesis is that various forces limit the ability of fiscal illusion to impact upon the level of expenditures of the public good. The empirical analysis yielded a positive, though insignificant, coefficient supporting such a hypothesis. Marshall argued that rigidities in state decisions and uncertainty as to the nature of the windfall may have been instrumental.

[14] Stanley L. Winer, "Some Evidence on the Separation of Spending and Taxing Decisions", *Journal of Political Economy* 91 (February 1983): 126-140.

[15] Robert R. Logan, "Fiscal Illusion and the Grantor Government", *Journal of Political Economy* 44 (December 1986): 1304-1318.

[16] Winer, "Some Evidence on the Effect of Spending", 127.

[17] A federal structure is prone to fiscal illusion of this form, regardless of whether the voter is aware of aid, or of the status of the local government (donor or recipient). If the voter is unaware of aid he may perceive a reduction in costs because of a higher portion of government spending in financing expenditures. If the voter is aware of aid, illusion may still prevail since the voter may well be unaware of his own provincial status (grantor tax share > local tax share) or that all communities in some sense finance a portion of aid to other provinces (intergovernmental-complexity). See Logan, "Fiscal Illusion and Grantor Government", 1310.

[18] Winer, "Some Evidence on the Effect of Spending", 127.

[19] Logan, "Fiscal Illusion and Grantor Government".

[20] David L. Hammes and Douglas T. Wills, "Fiscal Illusion and the Grantor Government in Canada", *Economic Inquiry* 25 (October 1987): 707-713.

[21] Winer, "Some Evidence on the Effect of Spending".

[22] Logan, "Fiscal Illusion and Grantor Government", 1317.

[23] See Patrick J. O'Brien and Yeung-Nan Shieh, "Utility Functions and Fiscal illusion from Grants", *National Tax Journal* 43 (1990): 201.

[24] Hammes and Wills argue that the issue of whether fiscal illusion existed or not in terms of the flypaper effect depended on the transfer of income. If *a priori* reasoning indicated that a transfer of income from donor to recipient voters did indeed take place then a higher level of recipient government expenditure was the result of fully-informed rational actors and not

fiscal illusion. If such *a priori* reasoning was not forthcoming then illusionary influences must be in play. See Hammes and Wills, "Fiscal Illusion and Grantor Government in Canada", 713.

[25] Thomas T. Romer and Harold Rosenthal, "The Elusive Median Voter", *Journal of Public Economics* 12 (No. 1 1979): 143-170.

[26] William R. Dougan and Daphne A. Kenyon, "Pressure Groups and Public Expenditures: The Flypaper Effect Reconsidered", *Economic Inquiry* 26 (January 1988): 159-170.

[27] Oates, "On the Nature and Measurement of Fiscal Illusion".

[28] Oates, "On the Nature and Measurement of Fiscal Illusion" and Cournat et. al., "The Stimulative Effects of Intergovernmental Grants" posit that the flypaper effect occurs when the perceived fall in recipient public good prices increases the demand for recipient expenditures. The illusionary effect occurs since the increase in grantor government taxes reduces voter's incomes. Winer, "Some Evidence on the Effect of Spending" argues that the fall in the perceived price of recipient expenditures occurs because voters believe the burden of taxation falls on other jurisdictions. Both approaches may be modelled in the manner of Logan, "Fiscal Illusion and Grantor Government" and Hammes and Wills "Fiscal Illusion and Grantor Government in Canada".

[29] Logan, "Fiscal Illusion and Grantor Government", 1306.

[30] O'Brien and Shieh, "Utility Functions", 201.

[31] The hypothesis states only that total grantor expenditure inclusive of grants could be higher, but grantor "own" expenditure will fall. Logan, "Fiscal Illusion and Grantor Government" 1306.

[32] Logan, "Fiscal Illusion and Grantor Government".

[33] Hammes and Wills, "Fiscal Illusion and Grantor Government in Canada".

[34] Logan, "Fiscal Illusion and Grantor Government", 1317.

[35] Ibid., 1317.

[36] See, for instance, Ibid., and Hammes and Wills, "Fiscal Illusion and Grantor Government in Canada".

[37] Logan, "Fiscal Illusion and Grantor Government".

[38] Hammes and Wills, "Fiscal Illusion and Grantor Government in Canada".

[39] Ibid., 709.

[40] See, Logan, "Fiscal Illusion and Grantor Government", 1312, and Hammes and Wills, "Fiscal Illusion and Grantor Government in Canada", 709.

[41] Logan, "Fiscal Illusion and Grantor Government".

[42] Hammes and Wills, "Fiscal Illusion and Grantor Government in Canada".

[43] Ibid., 709.

[44] Logan, "Fiscal Illusion and Grantor Government".

[45] Hammes and Wills, "Fiscal Illusion and Grantor Government in Canada", 710, maintain that "the differences in the U.S. and Canadian grant systems are important" in explaining the contrasting results (as presumably with Australia, the U.S. and Canada). Logan argues in turn that there is no reason why the U.S. evidence is unassailable; "perhaps a look at data from other countries would be useful to see if this effect [the observed negative relationship between grantor expenditure and perceived prices] is widespread". Logan, "Fiscal Illusion and Grantor Government", 1317.

[46] Hammes and Wills, "Fiscal Illusion and Grantor Government in Canada", 712.

[47] Logan, "Fiscal Illusion and Grantor Government", 1317.

[48] Ibid., 1317.

[49] Hammes and Wills, "Fiscal Illusion and Grantor Government in Canada", 712.