

AN ALLOCATION MODEL OF GOVERNMENT OUTLAYS: A DIFFERENTIAL APPROACH*

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Abstract

This study examines whether the Australian government responds to relative prices in allocating funds to competing government programs. Two allocation systems, a Working's type model and the Rotterdam model, are fit to Australian government expenditure data for five broad categories assuming preference independence. To choose between these two models, a general model that nests the two competing models is formulated and estimated. A Likelihood ratio test rejects the Rotterdam form for the data but does not reject the Working's type specification. Expenditure elasticities are reported over time for the Working's type model. Results suggest that the two categories, defense and health, and social security and welfare are luxuries while education, public order and safety, and others are necessities.

keywords: government allocation, Working's model, Rotterdam model, preference independence.

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I. Introduction

Cycles in aggregate income in the industrialized world focus increased attention on the allocation of government spending between competing policy areas. Specific issues range from questions about the size of spending on foreign aid versus domestic programs to the allocation of spending to improve a country's human capital. From a macroeconomic theory perspective, analysis is typically focused on the use of government spending to counteract the business cycle. The public finance approach generally questions whether the benefits to spending outweigh the costs in the long run. A subset of these theorists, namely the public choice theorists, would question the role of the market in setting public expenditure goals.

This study examines the allocation of Australian Government spending on five broad categories (i.e., defense; education; health, social security and welfare (HSW); public order and safety (POS); and others). Specifically, we fit a time-series version of the Working-PI (preference independence) model and the Rotterdam PI model to Australian government expenditure and price data for the five broad categories. Further, a synthetic model that nests the other two models is fit to statistically choose which of the two models better fits the data.

The next section of the paper discusses the basis of modeling government spending as an allocation problem. The following section discusses the development of the time-series version of the Working-PI model, the Rotterdam PI model, and the synthetic PI model. The next section describes the data used in this study and is followed by the reporting of analytical results. Finally, conclusions and implications of the study are presented.

II. Government Spending as an Allocation Problem

This section of the paper develops in greater detail the focus of the allocation problem which underlies the empirical models presented in the next section. Specifically, the allocation models to be estimated in this paper were originally developed to analyze the consumer's utility maximization

problem where consumers allocate individual incomes across goods to maximize their utility. The extension suggested in this paper is that governments allocate total revenues to maximize some social welfare function. This section reviews the literature underlying this assumption.

At its most basic level, the application of demand theory to the allocation of government expenditures would appear rather innocuous. The government would simply be hypothesized to allocate expenditures across various categories to maximize some social welfare function. However, several discrepancies have crept into the discussion of the allocation of government expenditures. Deacon (1978) and Dunne et al. (1984) raise questions regarding the production versus consumption nature of government spending. Specifically, these studies postulate that governments spend money on various areas to produce an unobservable commodity that is then consumed by the public. Hence, their models include some allowances for production decisions.

Following traditional demand theory, Deacon assumes that a set of demand functions for government services exists such that the quantity demanded for each category or type of service is a function of the price of the various services and the total level of government expenditures. Deacon's formulation then deviates from the traditional consumer demand model. Specifically, Deacon postulates that the quantity of each public good produced is a function of a vector of inputs and population. Invoking cost minimizing behavior, he then concludes that the expenditure of each program area is equal to a minimum cost per unit times the quantity of services demanded. By differentiating this expenditure for each category, Deacon then derives a formulation much like the traditional demand model. Differentiating this expenditure yields the result that the log change in the price of the i th government service is equal to the weighted share of each input used to produce that service times its price plus a term involving population. This result, essentially, replaces individual prices of goods used to produce the service with an expenditure index for producing that service. The required assumption is that the government produces each service in an efficient manner by allocating among inputs used to produce a government service according to cost minimization. This approach is mirrored in Dunne et al. who assume that the actual choice of how to implement

the program is separated from the allocation among program areas.

The second point of contention, assumed away by Deacon and Dunne et al., is the question of the appropriateness of demand theory at the societal level. In essence, one needs to justify the existence of an ordinal social utility function. From the theory of the consumer, we know that it is possible to construct an ordinal measure of utility if preferences are complete, reflexive, transitive, continuous, and strongly monotonic (Varian 1984, pp 111-113). Looking at the problem from a societal perspective, reflexivity, continuity and strong monotonicity would appear within the realm of reason. Specifically, any government allocation would be at least as good as itself (reflexivity), the set of government allocations would be at least as good as and at most no better than any other allocation and thus ruling out lexicographic preferences (continuity), and any government allocation containing more of at least one service and the same level for all other services would be preferred (strong monotonicity). Thus, the point of debate may focus on transitivity of societal preferences. If we are willing to accept that social preferences are transitive, then social preferences are consistent within the typical utility framework.

In this paper, we apply to government allocation the differential approach to consumer theory under the assumption that governments allocate their total expenditures among categories of goods (services) by maximization of a social welfare function. The study deviates from Deacon's formulation by assuming that the size of the population does not affect the cost of program delivery, an assumption consistent with Deacon's findings at the local level. In the next section, we develop the models used to fit the Australian data.

III. Derivation of the Time Series Working-PI Model

As described by Theil et al. (1989), the Working-PI or Florida model (Seale et al. 1991) has its genesis in Working's (1943) original formulation. Specifically, Workings model states

$$w_i = \alpha_i + \beta_i \text{Log}(E) \tag{1}$$

where w_i is the budget share for good i , $\text{Log}(E)$ is the natural logarithm of income, and α_i and β_i are parameters. To expand this model, Theil et al. note that equation (1) does not adjust for changes in relative prices. This is not inconsistent with Working's original formulation because of the cross-sectional nature of Working's data, but in the current study the relative price ratios change over time. Therefore, equation (1) must be augmented to capture these relative changes in price.

Both the time series Working-PI model and the Rotterdam PI model are derived from the differential formulation. Specifically, differentiating the first order conditions for utility maximization yields Barten's (1964) fundamental matrix equation,

$$\begin{bmatrix} \frac{d^2 u(q)}{dq dq'} & p \\ p' & 0 \end{bmatrix} \begin{bmatrix} \frac{dq}{dE} & \frac{dq}{dp'} \\ -\frac{d\mu}{dE} & -\frac{d\mu}{dp'} \end{bmatrix} = \begin{bmatrix} 0 & \mu I \\ 1 & -q' \end{bmatrix}, \quad (2)$$

where $u(q)$ is an unspecified utility function, p is a vector of prices, q is a vector of quantities, μ is the marginal utility of income, and I is an identity matrix. Solving for the dq/dp' component yields

$$\frac{dq_i}{dp_j} = \mu U^{ij} - \phi E \frac{dq_i}{dE} \frac{dq_j}{dE} - \frac{dq_i}{dE} q_j \quad (3)$$

where U^{ij} is the ij th component of the inverse of the Hessian matrix for utility and ϕ is the income flexibility.

In order to construct the typical differential demand formulation given the Barten results, we start by totally differentiating the quantity demanded with respect to the exogenous variables

$$dq_i = \frac{\partial q_i}{\partial E} dE + \sum_{j=1}^n \frac{\partial q_i}{\partial p_j} dp_j \quad (4).$$

Substituting for logarithmic differentiation and multiplying both sides by p_i/E yields

$$w_i d(\text{Log } q_i) = \theta_i d(\text{Log } E) + \sum_{j=1}^n \frac{p_i p_j}{E} \frac{\partial q_i}{\partial p_j} d(\text{Log } p_j) \quad (5)$$

where θ_i is the marginal share of good i .¹ Thus, combining equation (3) with equation (5) yields

$$w_i d(\text{Log } q_i) = \theta_i \left(d(\text{Log } E) - \sum_{j=1}^n w_j d(\text{Log } p_j) \right) + \phi \sum_{j=1}^n (\theta_{ij} - \theta_i \theta_j) d(\text{Log } p_j) \quad (6).$$

Replacing $d(\text{Log } E) - \sum_{j=1}^n w_j d(\text{Log } p_j)$ with $d(\text{Log } Q) = \sum_j w_j d(\text{Log } q_j)$ yields the traditional differential form

$$w_i d(\text{Log } q_i) = \theta_i d(\text{Log } Q) + \phi \sum_{j=1}^n (\theta_{ij} - \theta_i \theta_j) d(\text{Log } p_j) \quad (7).$$

Additivity and homogeneity on the parameters in equation (7) implies that $\sum_{j=1}^n \theta_j = 1$ and $\sum_{j=1}^n \theta_{ij} = 0$, respectively.

At this point we are faced with a variety of options regarding parameterization of the model. If we parameterize such that θ_i and $\pi = \phi(\theta_{ij} - \theta_i \theta_j)$ equal to some constants, the parameterization follows the traditional Rotterdam model. The alternative employed by the time series Working-PI or Florida model is to impose preference independence. Under preference independence, $\theta_{ii} = \theta_i$ and $\theta_{ij} = 0$ if i is not equal to j . Hence, the differential demand equation then becomes

$$w_i d(\text{Log } q_i) = \theta_i d(\text{Log } Q) + \phi \theta_i d \left[\text{Log } \left(\frac{p_i}{P^*} \right) \right] \quad (8)$$

where P^* is the Frisch price index (Theil 1975).

The time series representation estimated in this paper is derived by substituting

$$\bar{w}_{it} = 1/2(w_{i,t-1} + w_{i,t})$$

and setting $d(\text{Log } Q)$ equal to the log of the Divisia quantity index DQ_t , $d(\text{Log } p_i)$ equal to the change in natural log of price i Dp_{it} , $d(\text{Log } q_i)$ equal to the log change in quantity Dq_{it} , and $d(\text{Log } P^*)$ be

¹ Using this definition, $\theta_i = \partial q_i / \partial E$, equation (3) can be rewritten as

$$\frac{dq_i}{dp_j} = \phi \theta_{ij} - \phi \theta_i \theta_j - \theta_i w_j$$

the finite change version of the Frisch price index DP_t^* .² The estimated form of the differential model then becomes

$$\bar{w}_{it}Dq_{it} = \theta_i DQ_t + \phi \theta_i Dp_{it} - \phi \sum_{j=1}^n \theta_i \theta_j Dp_{jt} + \epsilon_{it}. \quad (9)$$

This formulation can be quantified in two ways: First, the θ_j s can be estimated as constants as in the Rotterdam PI model but, unlike the general Rotterdam model, the income flexibility term ϕ can be estimated. Second, the marginal budget shares could be parameterized consistent with the general Working's framework, $\theta_i = \bar{w}_{it} + \beta_i$.³

² Specifically, this parameterization is based on defining the $d(\text{Log}x_t)$ terms as

$$d(\text{Log}x) \doteq Dx_t = \text{Log}(x_t) - \text{Log}(x_{t-1}).$$

Hence, the change in quantity q_{it} is defined as

$$Dq_{it} = \text{Log}(q_{it}) - \text{Log}(q_{i,t-1}).$$

The finite change version of the Frisch price index then becomes

$$DP_t^* = \sum_{i=1}^n \theta_i Dp_{it}.$$

³ This parameterization is based on the definition of θ_i as the marginal share of good i and the basic Working's model. Specifically, multiplying the original Working's model, $w_i = \alpha_i + \beta_i \text{Log}(E)$, by total expenditures yields expenditure on good i, E_i . Differentiating total expenditures on good i with respect to total expenditures then yields the marginal share of good i in the consumption bundle

$$\begin{aligned} \frac{dE_i}{dE} &= \frac{d(\alpha_i E + \beta_i E \text{Log}(E))}{dE} \\ &= \alpha_i + \beta_i \text{Log}(E) + \beta_i \\ &= w_i + \beta_i. \end{aligned}$$

Under the first formulation the parametric representation is as depicted in equation (9). The Working-PI model is obtained by substituting for the θ_i s in equation (9) yielding

$$\bar{w}_{it}Dq_{it} = (\bar{w}_{it} + \beta_i)DQ_t + \phi(\bar{w}_{it} + \beta_i)Dp_{it} - \phi(\bar{w}_{it} + \beta_i) \sum_{j=1}^n (\bar{w}_{jt} + \beta_j)Dp_{jt} + \epsilon_{it} \quad (10)$$

or identically

$$\bar{w}_{it}(Dq_{it} - DQ_t) = \beta_i DQ_t + \phi(\bar{w}_{it} + \beta_i)Dp_{it} - \phi(\bar{w}_{it} + \beta_i) \sum_{j=1}^n (\bar{w}_{jt} + \beta_j)Dp_{jt} + \epsilon_{it}.$$

which completes the development of the time series Working-PI or Florida model.

The linkage between the time series Working-PI model in equation (10) and the Rotterdam PI model in equation (9) allows for a direct test of whether the marginal shares are constant. Specifically, instead of parameterizing with $\theta_i = \bar{w}_{it} + \beta_i$, we substitute $\theta_i = \delta \bar{w}_{it} + \beta_i$ for all i . The model then becomes

$$\bar{w}_{it}Dq_{it} = (\delta \bar{w}_{it} + \beta_i)DQ_t + \phi(\delta \bar{w}_{it} + \beta_i)Dp_{it} + \phi(\delta \bar{w}_{it} + \beta_i) \sum_{j=1}^n (\delta \bar{w}_{jt} + \beta_j)Dp_{jt} + \epsilon_{it}. \quad (11)$$

If $\delta = 1$ then the allocation follows the time series Working-PI. If, however, $\delta = 0$ then the marginal budget shares are constant and the allocation follows the Rotterdam PI formulation. Implicitly, this approach forms a “super” model as suggested by Barten.

IV. Data

To examine the effect of relative prices in the allocation of government outlays, this study uses quarterly data from Australia for the period 1976:III to 1990:I as reported in O’Sullivan who begins with 14 categories of Australian government expenditure as defined by the *Government Purpose Classification for Government Financial Statistics*. O’Sullivan aggregates these 14 categories into five: defense; education; health services and social welfare (HSSW); public order and safety (POS);

Note that this parameterization does not require the marginal share of good i to remain constant over all income levels.

and other. The 14 categories are displayed in Table 1 and the aggregation procedure is summarized in Table 2.

V. Results

When fitting the data, seasonal dummies for the second, third, and fourth quarters were incorporated into both the time series Working-PI and Rotterdam PI models. Under the Working PI formulation, the β_i s are the marginal change in the budget shares given a change in income. Specifically, $\theta_{it} = \bar{w}_{it} + \beta_i$ is the marginal share of good i in period t . β_i is then the difference between the marginal budget share and the average budget share $\bar{w}_{it}$. Thus, β_i indicates whether the marginal budget share is greater than, less than, or equal to the average budget share. If $\beta_i > 0$, good i is a luxury. Alternative if $\beta_i < 0$, good i is a necessity, and if $\beta_i = 0$, good i has unitary expenditure elasticity.

The estimated parameters for the Working PI model reported in column 2 of Table 3 indicate that defense and health services and social welfare are luxuries at any conventional level of significance. Specifically, each of the estimated β_i s are greater than zero implying that the marginal budget share is greater than the average budget share. Thus, the results indicate that as Australian government revenues expand, the government spends relatively more on defense and health services and social welfare after accounting for changes in relative prices. This is in contrast with education and other government expenditures whose marginal budget shares are lower than their average budget shares implying that these categories are necessities. Finally, the β_i on public order and safety indicates that this category has unitary expenditure elasticity.

The results of the Rotterdam PI model are presented in column 3) of Table 3. Under this formulation, the parameter estimates, θ_i s, are the marginal shares. Thus, unlike the Working-PI model, the marginal shares are held constant over the entire sample. This complicates the issue of determining whether a given program is a luxury or necessity because whether the marginal share exceeds the average share is dependent on the data point. For simplicity, let us examine

the implications of the Rotterdam PI formulation at the sample average. The average budget shares for defense, education, health services and social welfare, public order and safety, and other government expenditures are .13, .09, .57, .01, and .20, respectively. The Rotterdam PI results are, therefore, fairly consistent with the results from the Working-PI model. Specifically, the marginal shares of defense and health services and social welfare are both higher than their average shares indicating that these program areas are luxuries while education and other government expenditures both have estimated marginal shares less than the average share indicating that these program areas are necessities. However, under the Rotterdam PI formulation, the marginal share of health services and social welfare is not statistically different from the average share. Another interesting comparison is that the income flexibility parameters are fairly consistent across models.

In order to gain further insights into the effect of increases in government spending on various categories, it is informative to examine the behavior of the income elasticities over time. By definition, the income elasticity of demand for commodity i is

$$\eta_i = \frac{\frac{\partial q_i}{\partial E}}{\frac{q_i}{E}} = \frac{\frac{\partial(p_i q_i)}{\partial E}}{\frac{p_i q_i}{E}} = \frac{\theta_i}{w_i} \quad (12)$$

so that under both formulation the income elasticity is simply the marginal share over the average share. Hence, indexing for time the income elasticity of the time series Working-PI model becomes

$$\eta_{it}^F = 1 + \frac{\beta_i}{w_{it}}. \quad (13)$$

The annual elasticities for the Working PI formulation are given in table 5 and the annual elasticities for the Rotterdam formulation can be found in table 6.

Figure 1 depicts the income or government budget elasticity over time for defense under both formulations. This graph indicates that the percentage change in defense spending for a one percent change in total government expenditures is generally higher under the Rotterdam formulation than under the Working-PI model. However, more striking is the fact that the elasticity is more variable under the Rotterdam PI formulation. Specifically, the income elasticities range from 1.4 in quarter

18 to 1.7 in quarter 1. The Working-PI model, on the other hand, only gives a range of income elasticities between 1.4 in quarter 18 and 1.5 in quarter 1. Thus, the Rotterdam PI formulation yields a much higher maximum income elasticity.

Figure 2 depicts an even more striking difference in income elasticities for education under the alternative specifications. Figure 2 shows that the Working-PI formulation implies a declining government expenditure elasticity for education over time while the Rotterdam PI model yields an increasing expenditure elasticity over time. In addition, this difference is .26 or 54% of the income elasticity under the Working-PI formulation. However, unlike the income elasticity for defense both formulations yield about the same range in elasticities.

The income elasticity of health services and social welfare depicted in Figure 3 is an extreme example of the phenomenon depicted in Figure 1. Specifically, the elasticity under the Working-PI model is nearly constant over time while the elasticity under the Rotterdam PI specification is quite volatile.

The changes in the direction of income elasticity movements over time, the volatility of those elasticities, and the luxury versus necessity status of health services and social welfare point to the importance of the specification of the demand system. Thus, this study estimated the “super model” specified in equation (11). The estimation yielded a $\hat{\delta}$ of .8037 with a standard deviation of .2139. The test for the appropriateness of the Rotterdam PI model is then the test of the hypothesis $\delta = 0$ which has an asymptotic t of 3.76 implying that the Rotterdam PI specification can be rejected at any conventional significance level. The test for the appropriateness of the Working PI specification is then the test for $\delta = 1$ which has an asymptotic t of -.92 which we fail to reject at any conventional significance level. Hence, the time series Working-PI formulation is better supported by the data.

V. Conclusions

This study estimated two alternative specifications for the allocation of government spending to examine relative changes in various categories of spending. At the outset both formulations appear

to yield similar results. In both formulations defense spending and spending on health services and social welfare appear to be luxuries while education and other expenditures appear to be necessities. However, the marginal share of spending on health services and social welfare is not statistically different from the sample average budget share which calls the statistical significance of the income elasticity of this category into question under the Rotterdam model.

In addition, the dynamics of the various income elasticities under the alternative specifications show substantial differences. The calculated elasticity under the Rotterdam PI formulation is much more volatile. In addition the alternative specifications give different trends in income elasticity over time for education. Under the Rotterdam PI formulation the income elasticity trends up over time while the time series Working-PI elasticity trends down over time. Hence, a “super model” which nests both formulations was estimated to address the appropriateness of each formulation. Tests based on this model indicated that the Working PI formulation is more appropriate for the observed data.

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Table 1. General Budget Categories for Australian Government Expenditures [†]

Category Number	Category Name
01	General Public Services
02	Defense
03	Public Order and Safety
04	Education
05	Health
06	Social Security and Welfare
07	Housing and Community Amenities
08	Recreation and Culture
09	Fuel and Energy
10	Agriculture, Forestry, Fishing and Hunting
11	Mining, and Mineral Resources other than Fuels; Manufacturing and Construction
12	Transport and Communications
13	Other Economic Affairs
14	Other Purposes

[†] Source O'Sullivan**Table 2. Grouping into Major Service Areas [‡]**

Service Area	Individual Categories
Defense	02
Education	04
Health, Social Security and Welfare (HSSW)	05 & 06
Public Order & Safety (POS)	03
Other	01 & 07-14

[‡] Source O'Sullivan

**Table 3. Estimated Parameters under the Working PI and Rotterdam PI Models
for Australian Government Data, 1976:III-1990:I**

Categories	Working PI β_i	Rotterdam PI θ_i
Defense	.056 (.024) [†]	.203 (.058)
Education	-.041 (.016)	.058 (.018)
HSSW	.063 (.022)	.609 (.035)
POS	-.003 (.002)	.007 (.002)
Other	-.075 (.028)	.123 (.023)
ϕ	-1.203 (.148)	-1.183 (.154)
D12	.011 (.003)	.010 (.004)
D13	-.009 (.003)	-.008 (.003)
D14	.012 (.003)	.012 (.003)
D22	.007 (.002)	.007 (.002)
D23	-.001 (.002)	-.001 (.002)
D24	.003 (.002)	-.003 (.002)
D32	-.024 (.004)	-.024 (.004)
D33	.027 (.004)	.028 (.004)
D34	-.019 (.004)	-.019 (.004)
D42	.000 (.000)	.000 (.000)
D43	-.000 (.000)	-.000 (.000)
D44	.000 (.000)	.000 (.000)
D52	.006 (.003)	.007 (.003)
D53	-.017 (.003)	-.018 (.003)
D54	.004 (.003)	.004 (.003)

[†] Numbers in parenthesis denote standard deviations of estimates

Table 4. Annual Expenditure Elasticities Under the Working P.I. Model at Geometric Mean Prices and Observed Budget Shares, 1976:IV-1990-I

Year	Defense	Education	HSSW	POS	Other
1976:IV	1.4770	0.6361	1.1096	0.6592	0.6050
1977:I	1.4639	0.6289	1.1090	0.6633	0.5948
1977:II	1.4470	0.6105	1.1081	0.6596	0.5861
1977:III	1.4522	0.6109	1.1079	0.6672	0.5861
1977:IV	1.4664	0.6154	1.1074	0.6872	0.5851
1978:I	1.4604	0.6114	1.1085	0.6773	0.5975
1978:II	1.4496	0.5933	1.1094	0.6731	0.6119
1978:III	1.4204	0.5889	1.1096	0.6680	0.5979
1978:IV	1.4152	0.5962	1.1096	0.6733	0.5908
1979:I	1.4396	0.5838	1.1090	0.6799	0.6061
1979:II	1.4575	0.5769	1.1095	0.6811	0.6240
1979:III	1.4558	0.5831	1.1089	0.6753	0.6142
1979:IV	1.4430	0.5817	1.1081	0.6815	0.5990
1980:I	1.4416	0.5761	1.1099	0.6882	0.6191
1980:II	1.4431	0.5793	1.1116	0.6932	0.6350
1980:III	1.4425	0.5821	1.1105	0.6862	0.6236
1980:IV	1.4094	0.5681	1.1096	0.6858	0.5998
1981:I	1.3771	0.5618	1.1138	0.6959	0.6210
1981:II	1.3923	0.5813	1.1163	0.7127	0.6439
1981:III	1.4069	0.5926	1.1154	0.7328	0.6397
1981:IV	1.3923	0.5981	1.1153	0.7226	0.6283
1982:I	1.3943	0.5961	1.1178	0.7212	0.6503
1982:II	1.3924	0.5913	1.1192	0.7275	0.6609
1982:III	1.3943	0.6104	1.1181	0.7417	0.6451
1982:IV	1.4101	0.6089	1.1156	0.7412	0.6355
1983:I	1.3936	0.5762	1.1146	0.7251	0.6324
1983:II	1.3949	0.5434	1.1149	0.7331	0.6471
1983:III	1.4203	0.5587	1.1133	0.7355	0.6431
1983:IV	1.4361	0.5760	1.1119	0.7235	0.6339
1984:I	1.4453	0.5638	1.1118	0.7368	0.6413
1984:II	1.4474	0.5361	1.1126	0.7501	0.6571
1984:III	1.4094	0.5443	1.1138	0.7234	0.6472
1984:IV	1.4189	0.5410	1.1121	0.7172	0.6396
1985:I	1.4607	0.5104	1.1119	0.7427	0.6646
1985:II	1.4329	0.5169	1.1135	0.7483	0.6631
1985:III	1.4146	0.5489	1.1133	0.7375	0.6432
1985:IV	1.4080	0.5554	1.1128	0.7290	0.6335
1986:I	1.4136	0.5255	1.1133	0.7401	0.6502
1986:II	1.4130	0.4925	1.1153	0.7376	0.6729
1986:III	1.4110	0.5095	1.1137	0.7304	0.6565
1986:IV	1.4280	0.5313	1.1121	0.7335	0.6461
1987:I	1.4376	0.4942	1.1127	0.7410	0.6648
1987:II	1.4174	0.4974	1.1126	0.7508	0.6532
1987:III	1.4225	0.5176	1.1094	0.7435	0.6226
1987:IV	1.4450	0.5213	1.1078	0.7343	0.6184

Table 4 (Continued)

Year	Defense	Education	HSSW	POS	Other
1988:I	1.4383	0.4947	1.1086	0.7402	0.6306
1988:II	1.4207	0.4911	1.1093	0.7558	0.6277
1988:III	1.4357	0.4961	1.1079	0.7677	0.6195
1988:IV	1.4608	0.4828	1.1056	0.7633	0.6134
1989:I	1.4519	0.4777	1.1054	0.7661	0.6076
1989:II	1.4426	0.4572	1.1052	0.7700	0.6049
1989:III	1.4336	0.4887	1.1045	0.7562	0.5818
1989:IV	1.4274	0.5070	1.1043	0.7590	0.5664
1990:I	1.4351	0.4808	1.1041	0.7820	0.5772