

The Demand for Alcohol in Ireland

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Abstract: Equilibrium and dynamic versions of Deaton and Muellbauer's AIDS model are used to estimate demand systems for Irish consumption of beer, spirits and wine using quarterly data for the period 1969-1980. The dynamic model is preferred on the grounds that it allows both homogeneity and symmetry whereas the equilibrium model does not. Estimated elasticities are used to derive tax elasticities for the change in revenue resulting from changes in excise duties. These elasticities are unambiguously positive.

I INTRODUCTION

This paper uses a dynamic version of Deaton and Muellbauer's (1980a) Almost Ideal Demand System (AIDS) to estimate price and expenditure elasticities for alcohol consumption in Ireland. The study differs from previous work on this topic in at least three important respects. First, the data set are based on quarterly observations over 1969(1) to 1980(4) disaggregated into expenditures on beer, spirits and wine. Walsh and Walsh (1970) report price and income elasticities for beer and spirits but not for wine, while O'Riordan (1975) and McCarthy (1977) each report budget and price elasticities for the composite commodity alcohol using annual data.

Second, the use of a flexible functional form permits systematic testing of homogeneity and symmetry restrictions implied by utility maximisation. Previous studies use either ad hoc functional forms (Walsh and Walsh) or restrictive models such as the Linear Expenditure System (McCarthy) which typically impose restrictions on the preference ordering. Third, rather than

*This paper was completed while the author was visiting the Department of Economics, McMaster University, Hamilton, Ontario. Thanks are due to G. Boyle, P.T. Geary and two anonymous referees for comments on earlier drafts. The usual disclaimer applies.

assume that consumers adjust to equilibrium in each period the AIDS model is modified using the proposals of Anderson and Blundell (1982, 1983) who develop a dynamic system in which observed expenditure changes are treated as part of a dynamic adjustment process arising from "habit persistence, adjustment costs, incorrect expectations and misinterpreted real price changes" (Anderson and Blundell, 1982, p. 397). A considerable advantage of this approach is that it not only allows for a dynamic specification but also permits identification of the equilibrium structure and direct estimation of expenditure, own-price and cross-price elasticities.

Section II outlines the approach used and the elasticity estimates are presented in Section III. These estimates are used in Section IV to derive tax elasticities which relate changes in total revenue from alcohol taxation to changes in the rates of excise duty on beer, spirits and wine. A significant feature of the results is that these elasticities are unambiguously positive suggesting that tax revenue increases with the rates of excise duty applied to each good.

II A DYNAMIC MODEL

Due to the limitations imposed by data availability it is assumed that consumers can allocate total expenditure by a two-stage budgeting process which determines expenditure on broad subgroups (including alcohol) at the first stage, and expenditure within each group at the second stage.¹ Employing the Almost Ideal Demand System of Deaton and Muellbauer enables us to express a set of equilibrium equations of the form,

$$w = \pi x \quad (1)$$

where w is a 3 by 1 vector of budget shares in alcohol expenditure, π is a 3 by 5 matrix of coefficients and x is a 5 by 1 vector in the prices of beer, wine and spirits, total alcohol expenditure and a constant. It should be noted that the existence of these subgroup demand functions implies that the underlying, or first-stage, utility function is weakly separable in the broad subgroups. Thus, weak separability is both necessary and sufficient for the second stage of two-stage budgeting and, given this assumption, the demand functions in Equation (1) possess "all the usual properties of demand functions since they derive from a standard utility maximizing problem" (Deaton and Muellbauer, 1980b, p. 124).² Although weak separability is necessary

1. Quarterly expenditure and price data are not available for other goods.

2. Although weak separability places important restrictions on the degree of substitution between goods in different groups, it does affect the substitution pattern within groups. See Deaton and Muellbauer (1980b, pp. 128-129).

and sufficient for the second stage of the process, the allocation of total expenditure into broad subgroups at the first stage "is more problematical . . . [and] . . . an exact solution that does not require the composite commodity theorem demands conditions considerably stronger (and less plausible) than weak separability alone" (Deaton and Muellbauer, 1980b, p. 125). The AIDS model used below should therefore be considered as a reasonable approximation to Marshallian demand functions. While this approach is not perfect it is commonly used in empirical studies of demand systems. Anderson and Blundell (1983), for example, exclude durable goods from their expenditure system and, implicitly, take the same approach as used in the present paper.

The AIDS model is used because it is linear in the variables and, as will be explained below, permits simple testing of homogeneity and symmetry restrictions on Equation (1). The *i*th budget share in Equation (1) is given by,

$$w_i = \alpha_i + \sum_{j=1}^n \pi_{ij} \text{Ln}P_j + \beta_i \text{Ln}(m/P) \tag{2}$$

where P_j is the price of good *j*, *m* is total expenditure on alcohol and *P* is a subgroup price index given by,

$$\text{Ln}P = \alpha_0 + \sum_1^n \alpha_k \text{Ln}P_k + \frac{1}{2} \sum_1^n \sum_1^n \pi_{kj} \text{Ln}P_k \text{Ln}P_j \tag{3}$$

Given that $\sum w_i = 1$, Equations (2) and (3) must satisfy the following adding-up restrictions,

$$\sum_i \alpha_i = 1; \sum_i \pi_{ij} = \sum_i \beta_i = 0$$

while utility theory gives the homogeneity and symmetry restrictions,

$$\sum_j \pi_{ij} = 0, \text{ for all } i$$

$$\pi_{ij} = \pi_{ji}, \text{ for all } i, j; i \neq j$$

Anderson and Blundell (1982, p. 1561) propose a dynamic version of Equation (1) which assumes that "changes in *w*(*t*) are responses to anticipated and unanticipated changes in *x*(*t*) in an attempt to maintain a long-run relationship of the form (1) in the sense that should *x*(*t*) stabilize to some constant value over time then so would the expected value of *w*(*t*)" (1982, p. 1561), where *t* is time. Such a model may be written as,

$$B(L)w(t) = \Gamma(L)x(t) + u(t) \tag{4}$$

where *B* and Γ are matrix polynomials in the lag operator *L* and *u* is a vector of random errors. Anderson and Blundell also demonstrate that Equation (4)

may be reparameterised to give the observationally equivalent system,

$$\Delta w_n(t) = - \sum_2^p B_i \Delta w_n(t-i+1) + \sum_1^q \Gamma_i \Delta x^*(t-i+1) - A(w_n(t-p) - \pi_n x(t-q)) + u(t) \quad (5)$$

where Δ is the first difference operator, * indicates that the constant is deleted in differencing and the subscript n denotes that the last row is lost due to adding-up restrictions. B , Γ and A are matrices of dynamic parameters and p , q are the lags on w and x respectively. The advantage of Equation (5) is that it allows identification of the equilibrium structure and also permits likelihood ratio tests on the symmetry and homogeneity restrictions imposed by utility maximisation.

Under the assumption of weak separability the uncompensated price (E_{ij}) and expenditure (E_{im}) elasticities may be expressed as,

$$E_{ij} = E_{ij}^* + E_{im} E_{mj} \quad (6)$$

$$E_{im} = 1 + \beta_i / w_i \quad (7)$$

where

$$E_{ij}^* = w_i^{-1} (\pi_{ij} - \beta_i (\alpha_j + \sum_k \pi_{kj} \text{Ln} P_k)) - c_{ij}$$

and, $c_{ij} = 1$ for $i=j$ and zero otherwise. E_{mj} is the elasticity of total expenditure on alcohol with respect to P_j . To approximate E_{mj} we define m as PQ , where Q is an index of the quantities in Equation (1) and denote the elasticity of Q with respect to P by θ so that

$$\frac{dQ}{dP} = \theta \frac{Q}{P}$$

$$\text{and } \frac{dm}{dP} = Q + P \frac{dQ}{dP} = Q(1+\theta)$$

Further, let

$$\frac{dm}{dP_j} = \frac{\partial P}{\partial P_j} \frac{\partial m}{\partial P} = \frac{\partial P}{\partial P_j} Q(1+\theta)$$

$$\text{and } E_{mj} = \frac{P_j}{m} \frac{\partial m}{\partial P_j} = \frac{P_j}{m} \frac{\partial P}{\partial P_j} Q(1+\theta)$$

from (3)

$$\frac{\partial P}{\partial P_j} = P(\alpha_j + \sum_k \pi_{kj} \text{Ln} P_k) / P_j$$

so that,

$$E_{mj} = (\alpha_j + \sum_k \pi_{kj} \text{Ln}P_k)(1+\theta) \quad (8)$$

Although θ is not estimated by the present study it is generally accepted that alcohol consumption is relatively inelastic with respect to P . McCarthy (1977), for example, estimates θ over the range -0.62 to -0.80 on Irish data. The elasticity estimates presented in Section III therefore give estimates of E_{ij} for plausible values of θ between -0.6 and -1.

III DATA AND ESTIMATION³

This paper uses quarterly data for Irish consumption of beer (B), spirits (S) and wine (W) over the period 1969(1) to 1980(4). Quarterly series for beer and spirits consumption were obtained by aggregating the monthly series given in the *Irish Statistical Bulletin*. Only annual data are, however, available for wine consumption. The quarterly series for wine was approximated by using the "quarterly weights" implied by the other two series. Suppose AB_t , AS_t and AW_t represent the annual consumption of each good in year t , and define $v1i_t = QBi_t/AB_t$ and $v2i_t = QSi_t/AS_t$, $i = 1 \dots 4$, where QBi_t is the consumption of beer in the quarter i of year t and QSi_t is the consumption of spirits in the quarter i of year t . Then quarterly wine consumption is approximated by $QWi_t = AW_t(v1i_t + v2i_t)/2$. Each quarterly series is deflated by the average quarterly consumption in 1969 to produce consumption volume indices based on 1969 = 1. The price indices for each good were also adjusted to the base 1969 = 1 and the total expenditure index was approximated by,

$$m = \sum_1^n s_i q_i p_i; \sum_1^n s_i = 1 \quad (9)$$

where $i = B, S$ or W and s_i are the relative weights given to beer, spirits and wine in the CPI.

One method of selecting the appropriate lag lengths in Equation (5) is to perform a series of likelihood ratio tests for different values of p and q and select the most unrestricted model admitted by the data. However, given that likelihood ratio tests are sensitive to degrees of freedom the relatively short time series available implies that such tests would be asymptotically invalid for any reasonably high order of lags. For example, starting at $p=q=4$ implies estimation of 61 parameters (including seasonal dummies)

3. Data on three prices and on consumption of wine were supplied by Brendan Walsh to whom the author expresses his thanks. The price series are only available in index form. Hence the quantities are converted from actual units to indices.

Table 1: *Tests on restrictions.*

<i>Restrictions</i>	<i>Static model</i>	<i>Dynamic model</i>
Unrestricted	L = 340.8	L = 365.28
Homogeneity	L = 325.01 $\chi^2(2) = 31.58^{**}$ CV = 9.21	L = 361.01 $\chi^2(2) = 8.54^*$ CV = 9.21
Homogeneity and Symmetry	L = 313.4 ^{**} $\chi^2(1) = 23.22$ CV = 6.63	L = 359.28 $\chi^2(1) = 3.46$ CV = 6.63

Notes: L = log of likelihood function,
CV is the critical value of χ^2 at the 0.01 significance level.
*significant at the 0.05 level.
**significant at the 0.01 level.

from the 44 observations left after differencing and lagging. Given this limitation a first order process was assumed for Equation (5) which gives 25 parameters in 47 observations.⁴ Both static and first order dynamic ($p=q=1$) models were estimated using the appropriate maximum likelihood procedures in the SHAZAM package and homogeneity and symmetry restrictions tested for each model.⁵ The results of these likelihood ratio tests are given in Table 1.

The most striking feature of Table 1 is that the static model clearly rejects the restrictions implied by utility maximisation while the dynamic model rejects homogeneity at the 0.05 level but accepts it at the 0.01 level and also accepts symmetry given homogeneity. Furthermore, restricting the dynamic model to zero lags to give the static model would also be rejected at each stage in the testing sequence. The relevant chi-squares are 48.96 (12), 92 (12) and 91.68 (12) for unrestricted, homogeneity and symmetry/homogeneity, respectively, and the critical value for χ^2 (12) is 26.2 at the 0.01 significance level.

4. Unrestricted versions of Equation (5) were estimated for both third and second order lags. The restriction to $p=q=2$ was accepted as was the restriction to first order from second order lags. This procedure is justified on the grounds that it is consistent irrespective of the restrictions on π and Equation (5) will be exactly identified if π is unrestricted so that equation by equation OLS estimation is maximum likelihood.

5. Seasonal dummies were added to the model. The price equation (2) was approximated by $\text{Ln}P = \sum_{j=1}^n w_j \text{Ln}P_j + \alpha_0$ as suggested by Deaton and Muellbauer (1980a). The equation for wine consumption was deleted in the estimation.

On the basis of this evidence it seems reasonable to accept the dynamic model as an approximation of consumer behaviour. Table 2 gives estimates of the equilibrium parameters and Table 3 presents elasticity estimates based on values of w_i and P_i for 1980(4). Beer consumption is price and expenditure inelastic while the reverse is true for spirits and wine. The results on own-price and expenditure elasticities are in broad agreement with those reported for other countries.⁶ Turning to the cross-price elasticities, wine and spirits are unambiguous substitutes as are beer and spirits for values of θ greater than -0.9 . Beer and wine, on the other hand, are unambiguous complements. An interesting, and perhaps doubtful, feature of the cross-price terms is the relatively high values for E_{WB} and E_{WS} . While strong substitution of wine for spirits is intuitively appealing the magnitude of these elasticities is surprising as is the sign on E_{WB} . Apart from these two estimates the remainder of Table 3 appears to be a plausible representation of alcohol consumption.

IV REVENUE ELASTICITIES

Given the relatively high rates of taxation on alcohol, the above elasticity estimates are of considerable importance for revenue projections. Letting

Table 2: *Parameter estimates – dynamic model*

Parameter	Unrestricted			Homogeneity			Homogeneity and symmetry		
	B	S	W	B	S	W	B	S	W
α_i	.0283 (1.01)	.231 (0.450)	.686 (.912)	.653 (.189)	.319 (.188)	.028 (.061)	.217 (.057)	.728 (.109)	.001 (.098)
β_i	-.162 (.048)	.158 (.046)	.004 (.004)	-.118 (.022)	.093 (.023)	.025 (.008)	-.112 (.026)	.087 (.028)	.025 (.007)
π_{i1}	.172 (.063)	-.161 (.061)	-.011 (.066)	.224 (.027)	-.209 (.027)	-.015 (.012)	.077 (.027)	.021 (.014)	-.098 (.037)
π_{i2}	-.293 (.178)	.274 (.171)	.019 (.016)	-.351 (.126)	.314 (.124)	.037 (.047)	.021 (.014)	-.138 (.058)	.137 (.063)
π_{i3}	.176 (.145)	-.173 (.140)	-.003 (.013)	.127 (.112)	-.015 (.109)	-.022 (.038)	-.098 (.037)	.137 (.063)	-.039 (.079)
R^2	.98	.98		.95	.95				

Note: Figures in parentheses are asymptotic standard errors. The adding-up restriction implies that only two equations are estimated in each case. Hence the unrestricted estimates are derived from estimating the B and S equations by the method seemingly Unrelated Regressions.

6. See, for example, Duffy (1983) for estimates based on UK quarterly data.

Table 3: *Estimated elasticities*

Elasticity	Value of θ				
	-0.6	-0.7	-0.8	-0.9	-1
E_{BB}	-0.592	-0.633	-0.675	-0.717	-0.758
E_{SS}	-1.292	-1.354	-1.415	-1.476	-1.538
E_{WW}	-1.606	-1.603	-1.601	-1.598	-1.595
E_{BS}	0.296	0.256	0.217	0.177	0.137
E_{BW}	-0.185	-0.183	-0.181	-0.180	-0.178
E_{SB}	0.192	0.128	0.063	-0.001	-0.065
E_{SW}	0.360	0.363	0.366	0.368	0.370
E_{WB}	-1.427	-1.499	-1.571	-1.643	-1.716
E_{WS}	2.201	2.131	2.063	1.994	1.925
E_{BM}	0.800	0.800	0.800	0.800	0.800
E_{SM}	1.232	1.232	1.232	1.232	1.232
E_{WM}	1.386	1.386	1.386	1.386	1.386

Note: E_{ij} are own-price elasticities for $i=j$ and cross-price elasticities for $i \neq j$. E_{iM} are expenditure elasticities, $i = \text{Beer, Spirits, Wine}$.

k_i , v_i and P_{s_i} be the rate of excise duty, the VAT rate and seller's price for good i , then

$$P_i = (1+v_i)(P_{s_i}+k_i) \quad (10)$$

and tax revenue from good i is

$$R_i = q_i(P_i - P_{s_i}) \quad (11)$$

Total tax revenue from alcohol is given by,

$$R = \sum_i q_i [k_i + v_i(P_{s_i} + k_i)] \quad (12)$$

Setting v_i equal for all i gives the elasticity of total revenue with respect to each k as,

$$E_{Rk_j} = (1+v)(q_j + \sum_i (P_i - P_{s_i})E_{ij}q_i/P_j)(k_j/R) \quad (13)$$

where

$$E_{ij} \frac{q_i}{P_j} = \frac{\partial q_i}{\partial P_j} ; \frac{\partial P_{s_i}}{\partial k_j} = 0.$$

Note that if the cross-price elasticities are ignored then Equation (13) reduces to

$$E_{Rk_j} = (1+v)q_j(1+x_jE_{jj})(k_j/R) \quad (14)$$

where x_j is the proportion of tax in the final price of good j and E_{jj} is the own-price elasticity.⁷ Given that x_j is less than one and that the E_{jj} are negative for all j it follows that price inelasticity is a sufficient, but not necessary, condition for E_{Rkj} to be positive. The necessary condition is that the product of own-price elasticity and the proportion of tax in final price be less than unity. The elasticity estimates in Table 3 imply that raising excise duty on beer will unambiguously increase tax revenue as E_{BB} is always less than one in absolute value. For spirits, revenue will be an increasing function of k providing x is less than 0.65 for $\theta = -1$ or less than 0.77 for $\theta = -0.6$. Likewise revenue will increase with excise duty on wine for values of x less than 0.62.

Table 4 gives estimates of E_{Rkj} using Equation (12) which allows for cross-price effects. In deriving these estimates it is assumed that both v_i and x_i are equal for all goods. The VAT rate is set at 0.2 and x is varied between 0.4 and 0.8. As we are primarily interested in the possibility of revenue declining in response to increased taxation the figures given in Table 4 are the minimum sample estimates.⁸ Setting $x_i = 0.4$ for each good the minimum estimates of E_{Rkj} with $\theta = -0.6$, are 0.265, 0.141 and 0.018 for increases in the excise duty on beer, spirits and wine, respectively.

Table 4: *Minimum estimates of E_{Rkj}*

Tax change on	Value of θ				
	-0.6	-0.7	-0.8	-0.9	-1
Beer, $x = 0.4$	0.265	0.251	0.237	0.223	0.208
$x = 0.6$	0.256	0.249	0.224	0.198	0.172
$x = 0.8$	0.245	0.207	0.170	0.132	0.095
Spirits, $x = 0.4$	0.141	0.128	0.114	0.100	0.086
$x = 0.6$	0.174	0.149	0.123	0.097	0.071
$x = 0.8$	0.191	0.153	0.115	0.077	0.039
Wine, $x = 0.4$	0.018	0.018	0.018	0.017	0.017
$x = 0.6$	0.012	0.012	0.012	0.011	0.011
$x = 0.8$	0.002	0.003	0.006	0.008	0.009

7. Assuming $E_{ij} = 0$ for $i \neq j$ implies that $\partial R / \partial k_j = \partial R_j / \partial k_j$.

8. Assumed values of x are used because we are interested in whether or not there are values which would make E_{Rkj} negative. It may be the case that these elasticities are positive for values of x actually in operation but may become negative for other, equally plausible, levels of taxation.

In any case, v_i and x_i are approximately equal for beer, spirits and wine. At present x_i is approximately $.33 + .23/(1.33)$ or 0.5.

The significant feature of Table 4 is the complete absence of negative estimates. Even with taxation accounting for 80 per cent of final price, an increase in excise duty on any good will still generate some increase in total revenue. For example, given the estimates of E_{SS} an increase in excise duty on spirits would reduce tax revenue from spirits with x equal to 0.8. However, as both beer and wine consumption are increasing functions of the price of spirits, the estimates in Table 4 imply that this revenue loss is more than compensated for by increased revenue from the other goods.

V CONCLUSIONS

The principal objective of this paper was to estimate price and expenditure elasticities for beer, spirits and wine using quarterly Irish data for the period 1969 to 1980. In contrast with other work on alcohol consumption in Ireland, the demands for these goods were modelled in the context of a flexible dynamic system which permits identification of the equilibrium structure. An important reason for estimating the price elasticities is that they play a crucial role in determining the responsiveness of tax revenues to changes in the rates of excise duty on beer, spirits and wine. Section IV uses the elasticity values to estimate the impact of tax changes on total tax revenue and concludes that the elasticities are unambiguously positive. This suggests that any observed decline in revenue from alcohol taxation is most likely due to factors other than increased tax rates.

Although the results appear plausible on *a priori* grounds, there are several reasons for treating them with some caution. First, the initial stage of two-stage budgeting requires assumptions which are stronger than weak separability so that the AIDS model, Equation (2), is only an approximation to the true Marshallian demand functions. Some doubt must therefore be cast on whether or not it is valid to use such an approximation to test demand theory restrictions as in Section III. This problem is further compounded by the use of these tests in choosing between the static and dynamic versions of the AIDS model. However, it should be noted that the tests reported in Table 1 reject the unrestricted static model in favour of the dynamic model so that the use of the latter does not totally depend on its acceptance of homogeneity and symmetry restrictions.

Second, due to the limited time series available, a first order dynamic process is imposed on the model. While it is totally plausible that the data might accept longer lags, extending p and q beyond a first order process greatly increases the number of parameters to be estimated from a fixed number of observations. Furthermore, given that consumers are unlikely to adjust expenditures to equilibrium in each quarter, some form of dynamic process may be preferable to a static model even if the choice of lag length

is somewhat arbitrary.

Third, the model may be criticised on the grounds that it ignores several potentially important determinants of alcohol expenditures. For example, advertising, home brewing, duty-free purchases and, in the case of Ireland, smuggling, may play significant roles in the demand for beer, spirits and wine. While the omission of these variables cannot be totally justified, it is important to remember that the objective was to derive estimates of price and expenditure elasticities, which can be used to measure the responsiveness of tax revenues, rather than to present a comprehensive study of all factors determining alcohol consumption. Finally, it is not clear that these factors could be conveniently incorporated into a flexible functional form model, such as AIDS, which yields demand functions consistent with utility maximisation.

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DATA APPENDIX

Year	Quarter	Price indices (1969=1)			Expenditure shares		
		Beer	Spirits	Wine	Beer	Spirits	Wine
1969,	1	1.052	0.945	0.955	.565	.376	.059
	2	1.083	0.974	0.978	.642	.303	.055
	3	1.131	1.038	1.029	.662	.284	.054
	4	1.132	1.041	1.038	.552	.389	.059
1970,	1	1.132	1.044	1.042	.576	.367	.057
	2	1.178	1.079	1.084	.611	.333	.056
	3	1.219	1.082	1.099	.652	.293	.055
	4	1.223	1.083	1.107	.552	.389	.059
1971,	1	1.224	1.086	1.112	.616	.329	.055
	2	1.314	1.157	1.133	.631	.315	.054
	3	1.319	1.166	1.145	.659	.290	.051
	4	1.320	1.170	1.150	.558	.387	.055
1972,	1	1.325	1.175	1.154	.620	.322	.058
	2	1.326	1.177	1.163	.631	.315	.054
	3	1.329	1.183	1.172	.626	.319	.055
	4	1.361	1.203	1.203	.541	.401	.058
1973,	1	1.374	1.221	1.233	.586	.354	.060
	2	1.379	1.238	1.257	.596	.346	.058
	2	1.459	1.355	1.330	.640	.301	.059
	4	1.464	1.365	1.369	.511	.425	.064
1974,	1	1.470	1.375	1.410	.525	.408	.067
	2	1.570	1.424	1.476	.615	.322	.063
	3	1.576	1.428	1.499	.631	.305	.064
	4	1.606	1.432	1.540	.549	.384	.067
1975,	1	1.988	1.656	1.691	.622	.321	.057
	2	2.035	1.699	1.742	.615	.326	.059
	3	2.052	1.716	1.769	.661	.281	.058
	4	2.100	1.747	1.783	.498	.440	.062
1976,	1	2.469	1.929	1.913	.687	.261	.052
	2	2.810	2.050	2.058	.681	.269	.050
	3	2.825	2.056	2.093	.096	.253	.051
	4	2.864	2.105	2.105	.565	.380	.055
1977,	1	2.873	2.132	2.113	.671	.276	.053
	2	2.884	2.146	2.159	.673	.274	.053
	3	2.894	2.158	2.175	.661	.280	.059
	4	3.022	2.205	2.189	.546	.397	.057
1978,	1	3.031	2.214	2.211	.617	.322	.061
	2	3.041	2.228	2.227	.683	.259	.058
	3	3.294	2.338	2.278	.578	.361	.061
	4	3.197	2.334	2.290	.530	.406	.064
1979,	1	3.329	2.440	2.323	.632	.307	.061
	2	3.488	2.579	2.471	.686	.255	.059
	3	3.587	2.651	2.532	.655	.285	.060
	4	3.776	2.732	2.583	.549	.386	.065
1980,	1	3.904	2.864	2.649	.602	.337	.061
	2	4.353	3.352	3.253	.636	.305	.059
	3	4.368	3.377	3.295	.679	.259	.062
	4	4.658	3.488	3.363	.561	.374	.065