ETLA

Keskusteluaiheita
Discussion papers

Matti Virén

HOUSEHOLD CONSUMPTION BEHAVIOR:
A CROSS-COUNTRY STUDY OF 12
OECD COUNTRIES[*]

No. 100   February 4, 1982

HOUSEHOLD CONSUMPTION BEHAVIOR: A CROSS-COUNTRY STUDY OF 12 OECD COUNTRIES

1. Introduction

In this study we make use of the private consumption expenditure data of 12 OECD countries for the period 1960-1979. This data has been compiled on a uniform basis according to the present SNA, and hence offers a good opportunity for cross-country comparisons. In making these comparisons we try to find out whether the budget shares, elasticities and other relevant indicators are related to the level of income in these countries. Possible cross-section evidence then allows us to make some long-run projections of the patterns of household consumption behavior.

As a theoretical framework we use the extended linear expenditure system (ELES), cf. Lluch, Powell and Williams (1977). The advantage of this model - compared with, say the linear expenditure system (LES) - is that it treats saving explicitly, thus permitting the analysis of, for instance, the effects of relative prices on saving. This is possible because (households' disposable) income is treated as exogeneous in the model.

We start by describing some basic properties of ELES in Section 2, together with the method of estimation used in the analysis. Section 3 gives details of the data and also reports the estimation results. Finally, some concluding remarks follow in Section 4).

2. Theoretical considerations

The extended linear expenditure system (ELES) takes the following form:

$$(1) \quad C_{it} = p_{it}a_i + b_i(Y_t - \sum_{j=1}^{n} p_{jt}a_i)$$

where i denotes commodities (i = 1, 2,.., n), C_{it} expenditure on the ith good at current prices, Y_t households' disposable income at current prices and p_{it} the price of the ith good (in the following the implicit deflators of C_{it} are used for the price indices). As for the parameters a_i and b_i, the former is interpreted as being the value of subsistence consumption, while the latter is simply the marginal budget share for the ith commodity.

Now, given (1), the following formulas for demand elasticities can be derived:

1. The elasticity of demand for good i with respect to income:

    $$e_{iy} = b_i/w_i$$

2. The (uncompensated) elasticity of demand for good i with respect to the own price:

    $$e_{ii} = (1 - b_i) \frac{p_i a_i}{C_i} - 1$$

3. The elasticity of total expenditure with respect to income:

    $$e_y = uY/C$$

where w_i denotes the actual budget share of good i, u the
marginal propensity to consume and C the total consumption
expenditure at current prices. It should be pointed out
that the income elasticities, e_{iy}, are always positive since
no inferior goods are allowed with ELES (the same holds,
of course, for LES).

For the purpose of estimation the stochastic specification
of ELES may be written as:

$$(2) \quad C_{it} = p_{it}a_i + b_i(Y_t - \sum_{j=1}^{n} p_{it}a_i) + e_{it}$$

where the error terms, e_{it}, have the following standard
properties: $E(\varepsilon_t) = 0$, $E(\varepsilon_t, \varepsilon_t') = \Omega$ and $E(\varepsilon_t, \varepsilon_{t'}) = 0$ for
$t \neq t'$, ε_t being a vector of error terms and Ω a n x n
positive definite diagonal covariance matrix of errors across
equations.

Clearly (2) involves cross-equation restrictions on the
parameters, and hence the model must be estimated as a whole
by methods which impose the cross-equation constraints.
The procedure followed here is the nonlinear systems least
squares approach. The actual estimation was performed by
using the MNONLIN program, which is part of the SURVO 76
program package (cf. Mustonen and Mellin (1980)). The cor-
responding algorith is that of Davidon, Flecther and Powell.

3. Empirical results

3.1. Data

Annual data from 12 OECD countries is used in the subsequent
analyses: the countries arc listed in Table 1. The data
source for all time series is the National Accounts of OECD
Countries (various issues), the only exception being the
estimates of per capita domestic product for 1970 - used here
as an indicator for the income level - which are taken from
the United Nations Yearbook of National Account Statistics
1979.[1]

Table 1. Characteristics of the sample of 12 OECD countries

Country	Sample period	Per capita GDP in 1970 U.S. dollars
Greece	1960-1979	1134
Austria	1964-1979	1945
United Kingdom	1960-1979	2199
Finland	1960-1979	2305
Belgium	1960-1979	2652
France	1960-1979	2775
Norway	1962-1979	2882
Germany (FRG)	1960-1979	3055
Switzerland	1960-1979	3349
Canada	1960-1979	3884
Sweden	1963-1979	4107
United States	1960-1979	4789

The sample period is - with a few exceptions - 1960-1979;
eight-commodity aggregation is used for all countries.
These eight commodities and the 9th "commodity" - saving -
are listed in Table 2.

Before turning to consider the estimation results we present
some illustrative values of the data. The mean values of
average budget shares are given in Table 3, the changes
in these average budget shares in Table 4 and the changes
in (relative) prices in Table 5. Note that the 9th budget
share is simply the savings ratio. The mean values of the
average budget shares are also graphed in Figures 1 - 9
(see Appendix 1), thus allowing us to see whether there is
any relation between GDP per capita (in 1970 U.S. dollars)
and the budget shares.

Examining first the cross-section evidence (see Table 3
and Figures 1-9), the following observations can be made:
The budget shares of food and clothing decrease and the
budget shares of housing, transport and recreation increase
with the level of income. The sample variation in durables,
personal care, other services and saving does not exhibit
any clear relation to the level of income.

The changes in the budget shares are accord rather well in
accordance with this cross-section evidence. As regards
the budget shares of durables, personal care and other
services, in the majority of cases (countries) the budget

share of durables has decreased whereas the budget shares of personal care and other services have increased. The "budget share" of saving, i.e. the savings ratio, has also increased in most countries. In particular, it can be noted that the savings ratio has increased in all countries with a "relatively" low level of income.

The Kendall coefficient of concordance was computed in order to test the null hypothesis that the changes in budget shares over countries are unrelated to each other. The corresponding χ^2-statistic turned out to be 51.22, which clearly exceeds the 1 % critical value 20.09. Thus the null hypothesis of no relationship can be rejected.

The changes in price indices, presented in Table 5, display a very similar pattern over countries: the prices of 'other services', housing and personal care have increased more than other prices in practically all countries, while the opposite holds for the prices of clothing and durables, in particular. If the Kendall coefficient of concordance is again computed, the following χ^2 - statistic is obtained: $\chi^2_7 = 44.97 > 18.40 = \chi^2_{.01,7}$. Thus the null hypothesis that the changes in (relative) prices are unrelated to each other over countries can be clearly rejected.

3.2. Parameter estimates

We start by presenting the following results: the estimates of subsistence minimums (a_i) in Table 6, the estimates of marginal budget shares (b_i) and marginal propensity to consume (u) in Table 7, and finally the coefficients of determination (R^2) and the Durbin-Watson statistics (D-W) for the fitted equations in Table 8.

Given these estimates we computed the income and own-price elasticities, e_{iy}, e_y and e_{ii}, defined above. The income elasticities are shown in Table 9 and the price elasticities in Table 10.

Considering first Tables 6, 7 and 8, we find that in most cases the estimates are fairly precise and of expected sign and magnitude. The a_i parameters, which could be interpreted as subsistence minimums, are - with a few expections - positive. On the other hand, there seems to be a marked similarity between estimates over countries: food, clothing and housing seem predominate in subsistence consumption in all countries. "Personal care", by contrast, is a good of the opposite type; the corresponding parameter estimate is positive in only two or three countries and has a t-ratio which exceeds 2. This poor performance might be explained by the growth of the public health service system. An increase in public expenditure might well have also affected the results for "recreation" and "other services".

The marginal budget share parameters display a pattern
which is to large extent similar to that of average budget
shares (cf. Tables 3 and 4). Another feature which is
typical of linear expenditure systems is the fact that
these estimates are very precise. Only for Sweden are the
standard errors of "conventional" magnitude. All in all
the results for Sweden are not completely satisfactory:
for example the estimate of b_8 is negative, which is
clearly a perverse result.[2]

Finally, some comments on the R^2 and D-W statistics merit
note. The former are very high, as one might expect given
that the models are estimated in a level form. However,
the latter are very low, and hence the reported standard
errors at least should be interpreted with due care.[3]

Turning now to the elasticities, the income elasticities
presented in Table 9 display similar patterns over the
12 countries in the sample: the elasticities for food,
clothing and durables are less than one (there are,
however, a number of exceptions in the case of durables),
while the elasticities for personal care, transport,
recreation and other services are more or less systematical-
ly over one. The income elasticities with respect to total
expenditure, e_y, are all, with one exception, slightly less
than one. That in turn implies that the elasticities of
saving with respect to income, denoted by, say e_y', exceed
one.[4]

As for the (uncompenstad) price elasticities (presented
in Table 10), it is very difficult to discern any common
systematic feature in the values obtained, apart from the
fact that all (except one) of them are negative.

If the elasticities are compared in a "cross-section
sense", it appears that there is no relationship between
the level of income and the values of different elasticities.
This result should, however, be treated with some caution -
at least if more general conclusions are drawn. This is
because the expenditure system used in this study (i.e.
ELES) is rather restrictive and the differences between
the OECD countries are, after all, rather small.[5]

4. Concluding remarks

We have analyzed household consumption patterns in 12 OECD countries. Using time-series data from these countries for the period 1960-1979 and the extended linear expenditure system (ELES) as an analytical framework we have computed some descriptive measures of consumption patterns. These measures, i.e. budget shares and their changes, are clearly related to the level of real (per capita) income. As for the parameter estimates for subsistance consumption, marginal budget shares and price and income elasticities, they display very similar patterns over sample countries. What is somewhat surprising, is that there seems to be no relation between the price and income elasticities and the level of real (per capita) income.

In continuing our research we intend to concentrate on the analysis of houdeholds' savings behavior, especially in terms of relative prices and different income concepts.

Table 3. Average budget shares at sample mean values

Country	GDP per capita in 1970 U.S. dollars	w_1	w_2	w_3	w_4	w_5	w_6	w_7	w_8	w_9
Greece	1134	.3727	.0931	.1163	.0750	.0258	.0743	.0374	.0585	.1464
Austria	1945	.2750	.1052	.1055	.0834	.0312	.1179	.0563	.1423	.0827
United Kingdom	2199	.2508	.0827	.1628	.0755	.0082	.1143	.0886	.1518	.0647
Finland	2305	.3098	.0729	.1761	.0641	.0288	.1374	.0599	.0989	.0551
Belgium	2652	.2611	.0652	.1320	.1201	.0552	.0887	.0354	.0920	.1498
France	2775	.2387	.0760	.1182	.0904	.0851	.0996	.0542	.1059	.1315
Norway	2882	.2899	.0936	.1290	.0801	.0378	.1175	.0737	.0897	.0882
Germany (FRG)	3055	.2629	.0883	.1307	.1027	.0246	.1063	.0608	.0682	.1552
Switzerland	3349	.2833	.0605	.1556	.0696	.0552	.0944	.0813	.0717	.1281
Canada	3884	.2114	.0788	.1739	.0814	.0358	.1381	.0751	.1294	.0756
Sweden	4107	.2846	.0872	.2184	.0828	.0137	.1190	.0929	.0546	.0464
United States	4789	.1743	.0741	.1792	.0728	.0854	.1439	.0755	.1241	.0701

Table 4. Changes in average budget shares over the sample period[x]

Country	GDP per capita in 1970 U.S. dollars	w_1	w_2	w_3	w_4	w_5	w_6	w_7	w_8	w_9
Greece	1134	.7177	.9566	.6908	1.0114	1.1235	1.8273	.7842	1.2292	2.6498
Austria	1945	.6820	.9206	1.6065	.8476	1.6548	1.6421	1.0362	.9834	1.0285
United Kingdom	2199	.6889	.7207	1.2586	.7985	.7430	1.3316	1.1629	1.0231	2.1647
Finland	2305	.7600	.4354	.9822	1.0638	1.0429	1.5588	1.4779	1.4208	1.6732
Belgium	2652	.6728	.7446	.9096	1.0368	1.7645	1.2929	1.1109	1.2770	1.4525
France	2775	.6893	.6692	1.5063	.8831	1.6189	1.2957	1.0132	1.0107	1.0806
Norway	2882	.8355	.7720	1.0819	1.1127	1.3496	1.4047	1.2419	1.1271	.7922
Germany (FRG)	3055	.7419	.8619	1.4000	.9234	1.2131	1.7829	1.0893	1.2212	.8502
Switzerland	3349	.8034	.5814	1.2137	.6437	1.6963	1.3187	1.0397	1.3811	1.1100
Canada	3884	.7521	.7620	.9367	.8636	.4405	1.0793	1.6316	1.2235	2.8133
Sweden	4107	.8257	.7599	1.2372	.9706	1.2802	1.2401	1.3794	.9480	.6151
United States	4789	.7444	.7345	1.0754	.9002	1.7775	1.0889	1.2430	.9650	.9518

x) Ratio of average budget share in last year of sample to the one in first year of sample.

Table 5. Changes in commodity prices over the sample period[x]

Country	GDP per capita in 1970 U.S. dollars	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8
Greece	1134	4.138	3.096	2.762	3.287	3.810	3.645	4.436	4.148
Austria	1945	1.803	1.739	2.906	1.625	3.730	2.305	1.815	2.609
United Kingdom	2199	4.087	3.139	5.823	4.010	4.148	4.338	4.384	4.636
Finland	2305	4.094	3.476	4.073	3.815	3.642	4.521	4.048	5.813
Belgium	2652	2.357	2.150	2.616	2.361	3.234	2.458	2.616	3.076
France	2775	2.714	2.440	3.360	2.443	2.770	2.890	2.431	2.820
Norway	2882	2.814	2.721	2.804	2.709	3.630	2.885	2.376	3.382
Germany (FRG)	3055	1.777	1.944	2.830	1.787	2.711	2.036	2.040	2.438
Switzerland	3349	2.019	1.885	2.908	2.085	3.604	2.335	2.154	2.874
Canada	3884	2.667	1.926	2.403	2.137	2.248	2.080	2.446	3.324
Sweden	4107	2.775	2.039	3.326	3.001	3.560	3.092	2.480	3.981
United States	4789	2.477	1.797	2.162	2.023	2.894	2.216	2.073	2.454

x) Ratio of price in last year of sample to the one in first year of sample. Note that there are minor differences in sample periods (cf. Table 1).

Table 6. Estimated subsistance minimums $(a_i)^{x)}$

Country	GDP per capita in 1970 U.S. dollars	base year	$\hat{a}_1$	$\hat{a}_2$	$\hat{a}_3$	$\hat{a}_4$	$\hat{a}_5$	$\hat{a}_6$	$\hat{a}_7$	$\hat{a}_8$
Greece	1134	1970	48788 (3238)	8730 (1466)	14313 (1404)	5750 (1474)	1618 (954)	-1836 (2021)	4666 (1290)	3332 (1626)
Austria	1945	1964	44.47 (2.10)	12.01 (1.76)	-2.65 (4.38)	10.43 (1.40)	1.42 (2.13)	-.12 (3.55)	5.00 (1.39)	16.08 (2.34)
United Kingdom	2199	1975	12831 (2638)	3187 (178)	7134 (555)	3198 (209)	376 (152)	3152 (476)	2656 (348)	5755 (390)
Finland	2305	1975	8561 (685)	2723 (182)	2925 (641)	1073 (308)	393 (226)	923 (783)	-265 (440)	315 (856)
Belgium	2652	1975	230085 (8627)	46941 (4950)	86028 (8869)	51613 (8768)	-17583 (10784)	20918 (8966)	14966 (6502)	32949 (8653)
France	2775	1970	77662 (3262)	24112 (1479)	-7026 (5452)	15843 (2393)	-10152 (3708)	417 (3985)	3230 (2120)	14433 (3176)
Norway	2882	1975	14757 (970)	5117 (456)	4300 (762)	2706 (660)	1749 (561)	1880 (1021)	1625 (564)	4201 (694)
Germany (FRG)	3055	1970	42746 (3337)	8643 (2301)	-28375 (8072)	6198 (2284)	-4263 (3998)	-28319 (4569)	-758 (2396)	-5320 (3620)
Switzerland	3349	1970	9837 (637)	2849 (288)	4389 (853)	3218 (313)	945 (647)	2323 (534)	2564 (420)	1574 (594)
Canada	3884	1971	7166 (347)	2363 (186)	5284 (381)	2256 (208)	1367 (125)	3270 (347)	1120 (303)	3269 (441)
Sweden	4107	1975	33806 (1452)	8108 (763)	21365 (3090)	9006 (864)	2903 (517)	12266 (1940)	5838 (1645)	11145 (592)
United States	4789	1970	71318 (5335)	27960 (2902)	22180 (9039)	20354 (3533)	-24231 (11662)	15593 (7853)	7896 (4578)	34841 (5995)

x) Measured in (millions of) national currency units in base-year prices. Asymptotic standard errors are given in parentheses.

Table 7. Estimated marginal budget shares (b_i) and marginal propensity to consume $(u)^{x)}$

Country	GDP per capita in 1970 U.S. dollars	$\hat{b}_1$	$\hat{b}_2$	$\hat{b}_3$	$\hat{b}_4$	$\hat{b}_5$	$\hat{b}_6$	$\hat{b}_7$	$\hat{b}_8$	$\hat{u}$
Greece	1134	.2407 (.0046)	.0885 (.0033)	.0875 (.0029)	.0830 (.0035)	.0280 (.0038)	.1351 (.0038)	.0273 (.0049)	.0727 (.0044)	.7628
Austria	1945	.1252 (.0070)	.0909 (.0063)	.2020 (.0144)	.0673 (.0056)	.0387 (.0181)	.1889 (.0078)	.0588 (.0058)	.1003 (.0094)	.8821
United Kingdom	2199	.0892 (.0046)	.0657 (.0037)	.1614 (.0076)	.0555 (.0045)	.0036 (.0048)	.1747 (.0053)	.1254 (.0048)	.1480 (0051)	.8235
Finland	2305	.1818 (.0053)	.0099 (.0043)	.1804 (.0052)	.0648 (.0048)	.0252 (.0048	.1887 (.0066)	.1052 (.0051)	.1500 (.0093)	.9060
Belgium	2652	.1256 (.0040)	.0421 (.0036)	.1069 (.0045)	.1285 (.0039)	.1072 (.0056)	.1158 (.0043)	.0393 (.0046)	.1068 (.0045)	.7722
France	2775	.1135 (.0029)	.0371 (.0026)	.1712 (.0049)	.0786 (.0025)	.1349 (.0027)	.1307 (.0034)	.0626 (.0024)	.1034 (.0028)	.8320
Norway	2882	.1763 (.0090)	.0437 (.0085)	.1485 (.0087)	.0951 (.0089)	.0368 (.0105)	.1913 (.0092)	.1082 (.0074)	.0743 (.0108)	.8742
Germany (FRG)	3055	.1509 (.0037)	.0656 (.0035)	.1951' (.0078)	.0864 (.0032)	.0351 (.0077)	.1784 (.0041)	.0625 (.0036)	.0810 (.0053)	.8550
Switzerland	3349	.2029 (.0090)	.0129 (.0080)	.1702 (.0130)	.0237 (.0081)	.0842 (.0160)	.1100 (.0098)	.0747 (.0088)	.0929 (.0126)	.7715
Canada	3884	.1384 (.0028)	.0670 (.0020)	.1492 (.0026)	.0746 (.0022)	.0171 (.0023)	.1499 (.0022)	.1098 (.0025)	.1406 (.0041)	.8466
Sweden	4107	.1443 (.0092)	.0881 (.0083)	.2835 (.0132)	.0621 (.0101)	.0084 (.108)	.1771 (.0107)	.1962 (.0101)	-.0198 (.0130)	.9399
United States	4789	.0840 (.0047)	.0463 (.0031)	.1992 (.0038)	.0577 (.0035)	.1723 (.0081)	.1655 (.0038	.0901 (.0035)	.0987 (.0044)	.9138

x) Asymptotic standard errors are given in parentheses.

Table 8. Coefficients of determination (R^2) and Durbin-Watson (D-W) statistics

Country	GDP per capita in 1970 U.S. dollars	R_1^2/D-W$_1$	R_2^2/D-W$_2$	R_3^2/D-W$_3$	R_4^2/D-W$_4$	R_5^2/D-W$_5$	R_6^2/D-W$_6$	R_7^2/D-W$_7$	R_8^2/D-W$_8$	R^2 of entire model
Greece	1134	.9992	.9963	.9988	.9959	.9997	.9865	.9928	.9983	.9986
		.8926	.7779	.9392	.6827	.3724	.5493	2.0021	.8902	
Austria	1945	.9989	.9860	.9895	.9617	.9918	.9924	.9973	.9992	.9969
		1.4972	.4420	.3671	.7461	.9240	2.5297	.8863	1.1948	
United Kingdom	2199	.9998	.9994	.9990	.9990	.9883	.9976	.9965	.9993	.9993
		1.3860	.6904	1.2690	1.4131	.2736	.9780	1.1059	1.2146	
Finland	2305	.9987	.9594	.9980	.9917	.9945	.9978	.9938	.9992	.9986
		.4879	.5517	1.2098	.4485	.8950	2.1094	.3369	1.0300	
Belgium	2652	.9979	.9967	.9933	.9958	.9887	.9959	.9945	.9935	.9975
		.2816	1.1214	.5978	.8949	.3897	.4536	.2970	1.1078	
France	2775	.9995	.9947	.9989	.9961	.9968	.9976	.9993	.9996	.9990
		.7622	.4332	1.2566	1.1191	.5179	1.6291	1.3368	1.5113	
Norway	2882	.9989	.9946	.9861	.9924	.9961	.9924	.9947	.9985	.9967
		.5488	.6008	1.1284	.8755	.2659	1.5042	.9495	.4873	
Germany (FRG)	3055	.9990	.9974	.9957	.9950	.9854	.9905	.9983	.9965	.9982
		1.0002	.6816	1.0377	.6155	.2222	.3753	.3070	.4024	
Switzerland	3349	.9986	.9070	.9790	.9589	.9805	.9817	.9952	.9835	.9946
		.6680	.2651	.2415	.4296	.1515	.3901	.2618	.1559	
Canada	3884	.9993	.9981	.9965	.9976	.9677	.9992	.9975	.9987	.9988
		.7729	1.1789	.4665	.5248	.6733	1.4866	.4086	.6058	
Sweden	4107	.9986	.9918	.9959	.9962	.9874	.9973	.9975	.9907	.9985
		1.1334	.3586	.6615	.6683	.6816	1.3270	.8684	.5304	
United States	4789	.9990	.9990	.9966	.9950	.9940	.9957	.9989	.9985	.9976
		.7611	.5234	.2885	.6015	.3222	1.0442	.4496	.4355	

Table 9. Income elasticities

Country	GDP per capita in 1970 U.S. dollars	e_{1y}	e_{2y}	e_{3y}	e_{4y}	e_{5y}	e_{6y}	e_{7y}	e_{8y}	e_y
Greece	1134	.6458	.9508	.7525	1.1067	1.0774	1.8185	.7318	1.2429	.8936
Austria	1945	.4554	.8642	1.9144	.8072	1.2406	1.6873	1.0450	1.2128	.9616
United Kingdon	2199	.3555	.7939	.9914	.7347	.4348	1.5285	1.4157	.9747	.8800
Finland	2305	.5869	.1362	1.0213	1.0106	1.0168	1.3736	1.7575	1.5171	.9587
Belgium	2652	.4811	.6458	.8100	1.0700	1.9425	1.3060	1.1103	1.1605	.9083
France	2775	.4755	.4888	1.4564	.8700	1.5849	1.3122	1.1552	.9760	.9579
Norway	2882	.6103	.4663	1.1512	1.1879	.9748	1.6278	1.4679	.8287	.9587
Germany (FRG)	3055	.5738	.7425	1.4929	.8409	1.4277	1.6780	1.0285	1.1881	1.0121
Switzerland	3349	.7162	.2131	1.0939	.3402	1.5252	1.1651	.9191	1.2963	.8848
Canada	3884	.6545	.8496	.8579	.9179	.4774	1.0855	1.4627	1.0864	.9158
Sweden	4107	.5069	1.0101	1.2982	.7504	.6161	1.4883	2.1119	-.3618	.9856
United States	4789	.4819	.6242	1.1115	.7930	2.0395	1.1501	1.1939	.7949	.9827

Table 10. Uncompensated own-price elasticities

Country	GDP per capita in 1970 U.S. dollars	e_{11}	e_{22}	e_{33}	e_{44}	e_{55}	e_{66}	e_{77}	e_{88}
Greece	1134	-.5821	-.7151	-.6048	-.7612	-.7589	-.0656	-.5372	-.8258
Austria	1945	-.3898	-.5880	-1.0987	-.5437	-.7337	-1.0036	-.6662	-.1117
United Kingdom	2199	-.2350	-.3975	-.4938	-.3608	-.2280	-.7680	-.6248	-.4952
Finland	2305	-.5184	-.1254	-.7374	-.6983	-.6974	-.8937	-1.0707	-.9531
Belgium	2652	-.4320	-.4826	-.6066	-.7514	-1.1651	-.8655	-.7408	-.7890
France	2775	-.4734	-.4408	-1.0760	-.7286	-1.1570	-1.0060	-.9110	-.8029
Norway	2882	-.4405	-.2705	-.6365	-.6209	-.4697	-.8360	-.7850	-.3743
Germany (FRG)	3055	-.6684	-.7815	-1.3693	-.8734	-1.3699	-1.4915	-1.0257	-1 1653
Switzerland	3349	- 4867	- 1264	-.6088	-.2003	-.7362	-.6286	-.5087	-.6658
Canada	3884	-.4762	- 5557	-.5770	-.5821	-.3276	-.6862	-.8131	-.6657
Sweden	4107	-.2566	-.3424	-.5160	-.2580	-.0786	-.4677	-.5038	+.7715
United States	4789	-.4254	-.5026	-.8302	-.6211	-1.3132	-.8706	-.8732	-.6377

FOOTNOTES

1) The Swedish time series for household saving are un-
   published data from the Central Statistical Office of
   Sweden (SCB). The Norwegian data for household saving
   differs from the corresponding data of other countries
   in that it includes the whole of the private sector.

2) An obvious reason is that the data on consumption
   expenditure for the 1960's, which is based on the former
   SNA (and which has been revised by the present author),
   is not completely accurate.

3) One should, however, note that because of nonlinearities
   the DW statistic is only a descriptive indicator un-
   known statistical properties. Whether or not there is a
   'significant amount' of autocorrelation, it is reassuring
   that there is some evidence to suggest that allowance
   for serial correlation does not substantially affect the
   estimates of ELES (see e.g. Lluch and Williams (1975)).
   In this respect ELES seems to be clearly superior to LES
   (cf. also Berndt and Savin (1975)).

4) In fact, most of these elasticities (e_y') are of the
   magnitude 1.5, the only exceptions being the United
   Kingdom with 2.4, Germany with 1.0 and Sweden with 3.6
   (the result for Sweden again indicates that there might
   be measurement errors in the data).

5) That the differences between sample countries are
   rather small also became apparent when computing the Frisch
   parameters: all except two (the United Kingdom and Sweden)
   fall within the range 1.0 - 2.0 (we intend to prepare a
   separate report on these estimates at a later date).

REFERENCES

Berndt, E. R. and Savin, N. E.: (1975) Estimation and
        Hypotheses Testing in Singular Equation Systems
        with Autoregressive Disturbances, Econometrica,
        937-958.

Lluch, C. and Williams, R. A.: (1975) Consumer Demand
        Systems and Aggregate Consumption in the USA:
        An Application of the Extended Linear Expenditure
        System, Canadian Journal of Economics, 19-25.

Lluch, C. and Powell, A. A. and Williams, R. A.: (1977)
        Patterns in Household Demand and Saving (A World
        Bank Research Publication), Oxford University
        Press.

Mustonen, S. and Mellin, I.: (1980) SURVO 1976 Program
        Descriptions, University of Helsinki, Department
        of Statistics.

Appendix 1

Figures of average budget shares at sample mean values
Data source: National Accounts of OECD Countries (the
classification of goods is presented in Table 2., the data
is also presented in Table 3.)

Figure 1. Budget share of food
Kuvio 1. Elintarvikkeiden, juomien ja tupakan budjettiosuus
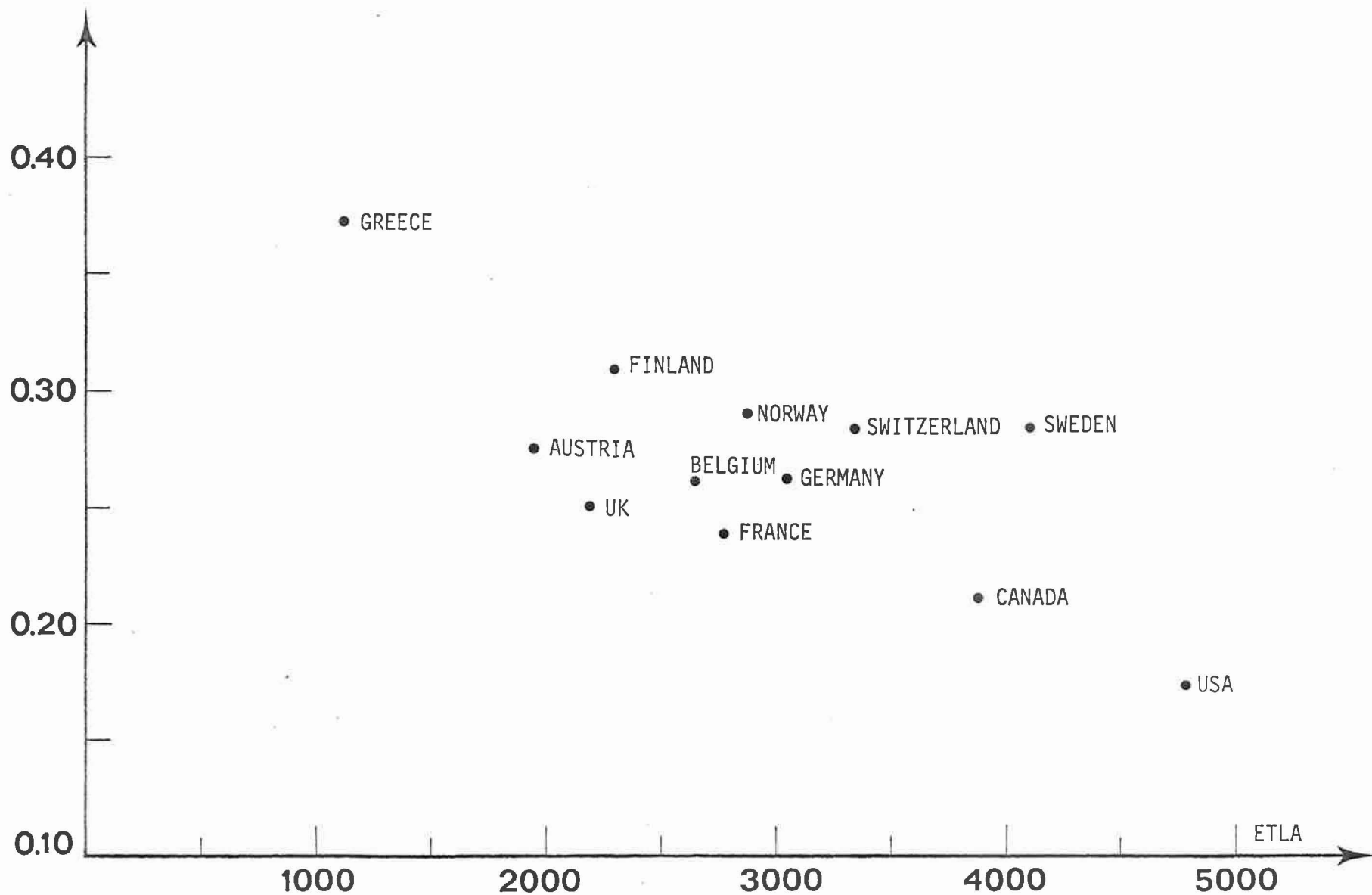
GDP per capita in 1970 U.S. dollars
BKT henkeä kohden Yhdysvaltain dollareissa
v. 1970

Figure 2.   Budget share of clothing
Kuvio 2.   Vaatteiden ja jalkineiden budjettiosuus
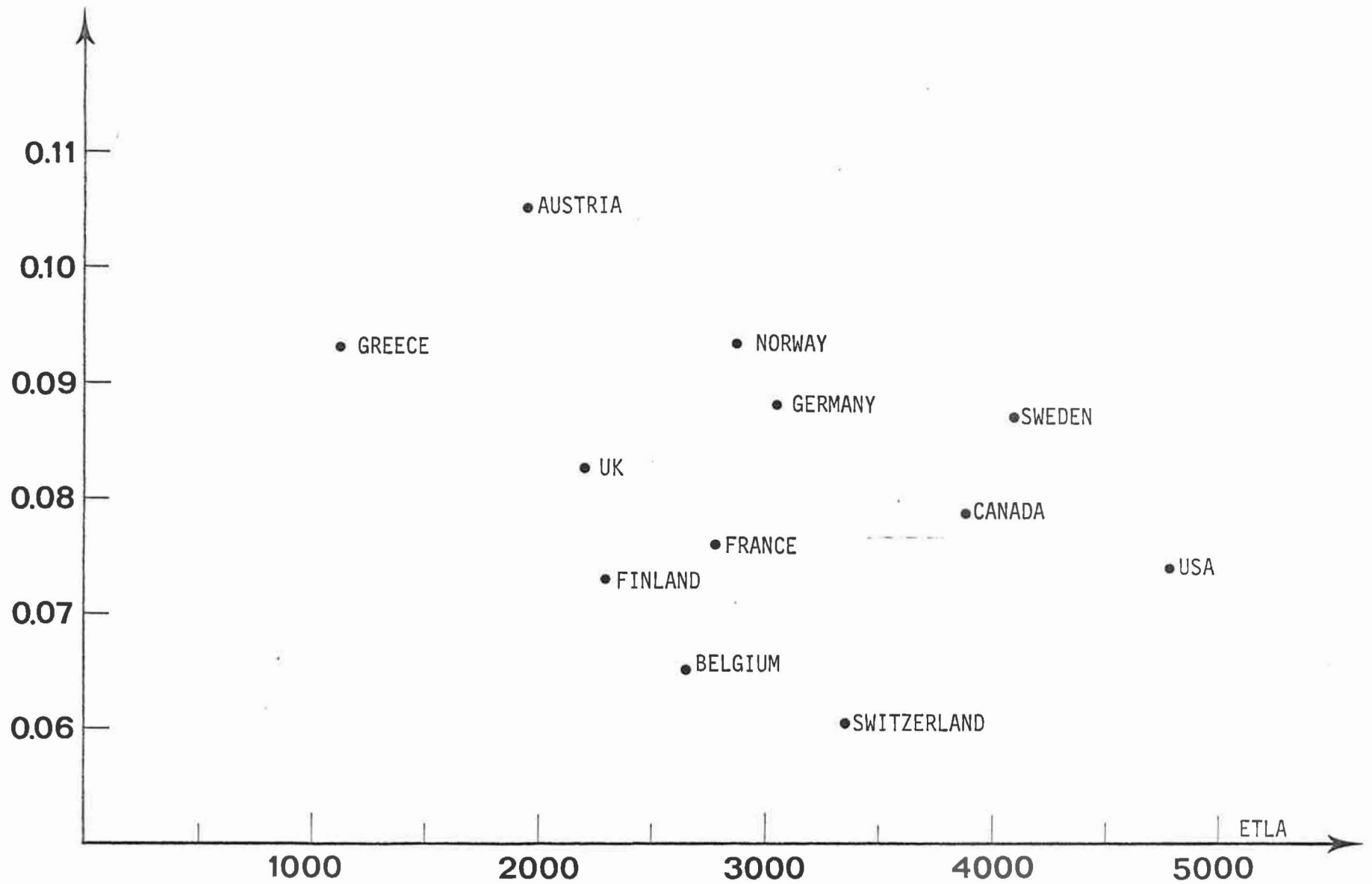
GDP per capita in 1970 U.S. dollars
BKT henkeä kohden Yhdysvaltain dollareissa
v. 1970

Figure 3. Budget share of housing
Kuvio 3. Asuntopalvelusten budjettiosuus
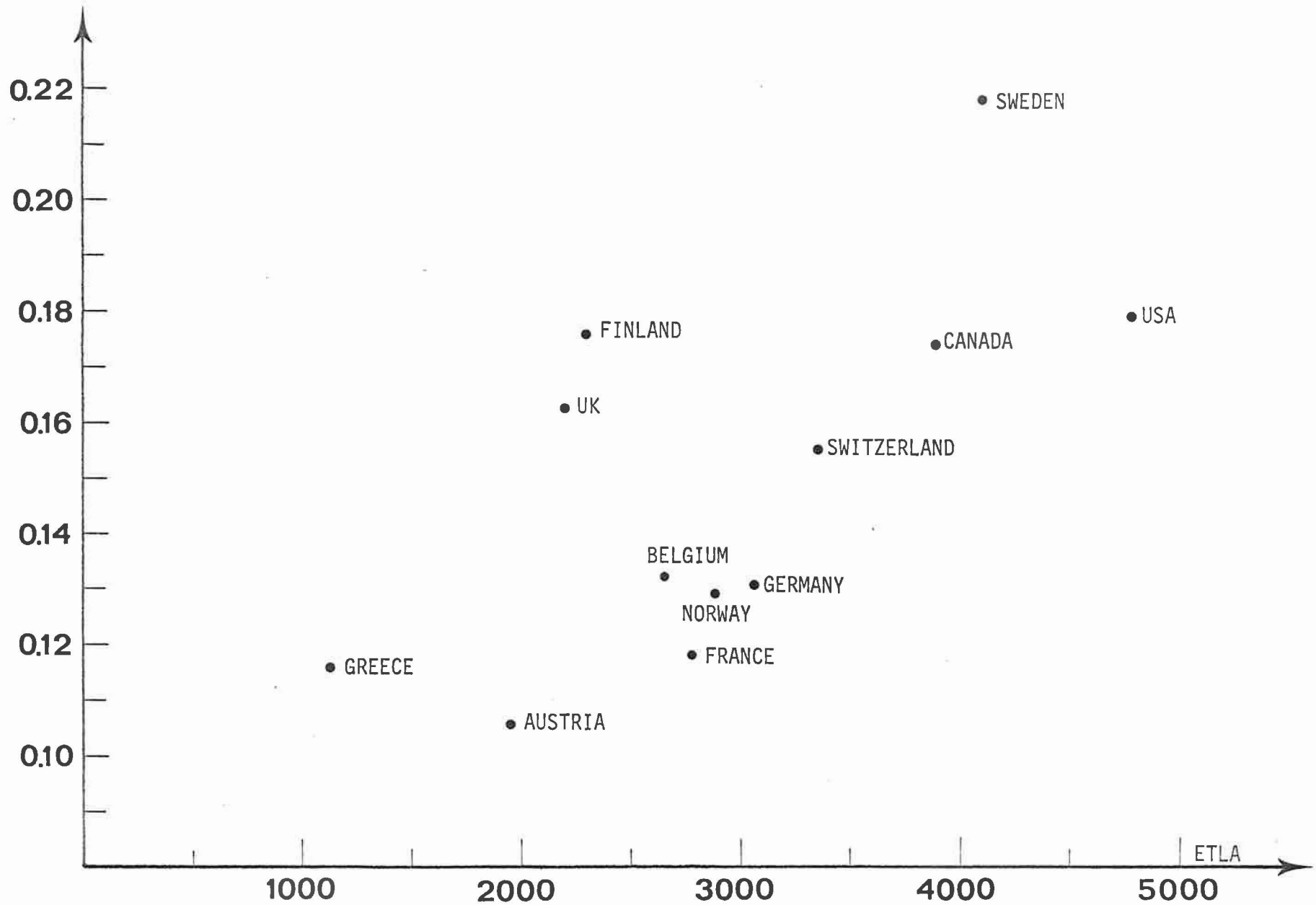
GDP per capita in 1970 U.S. dollars
BKT henkeä kohden Yhdysvaltain dollareissa v. 1970

Figure 4.   Budget share of durables
Kuvio 4.   Kotitalouskaluston yms, budjettiosuus
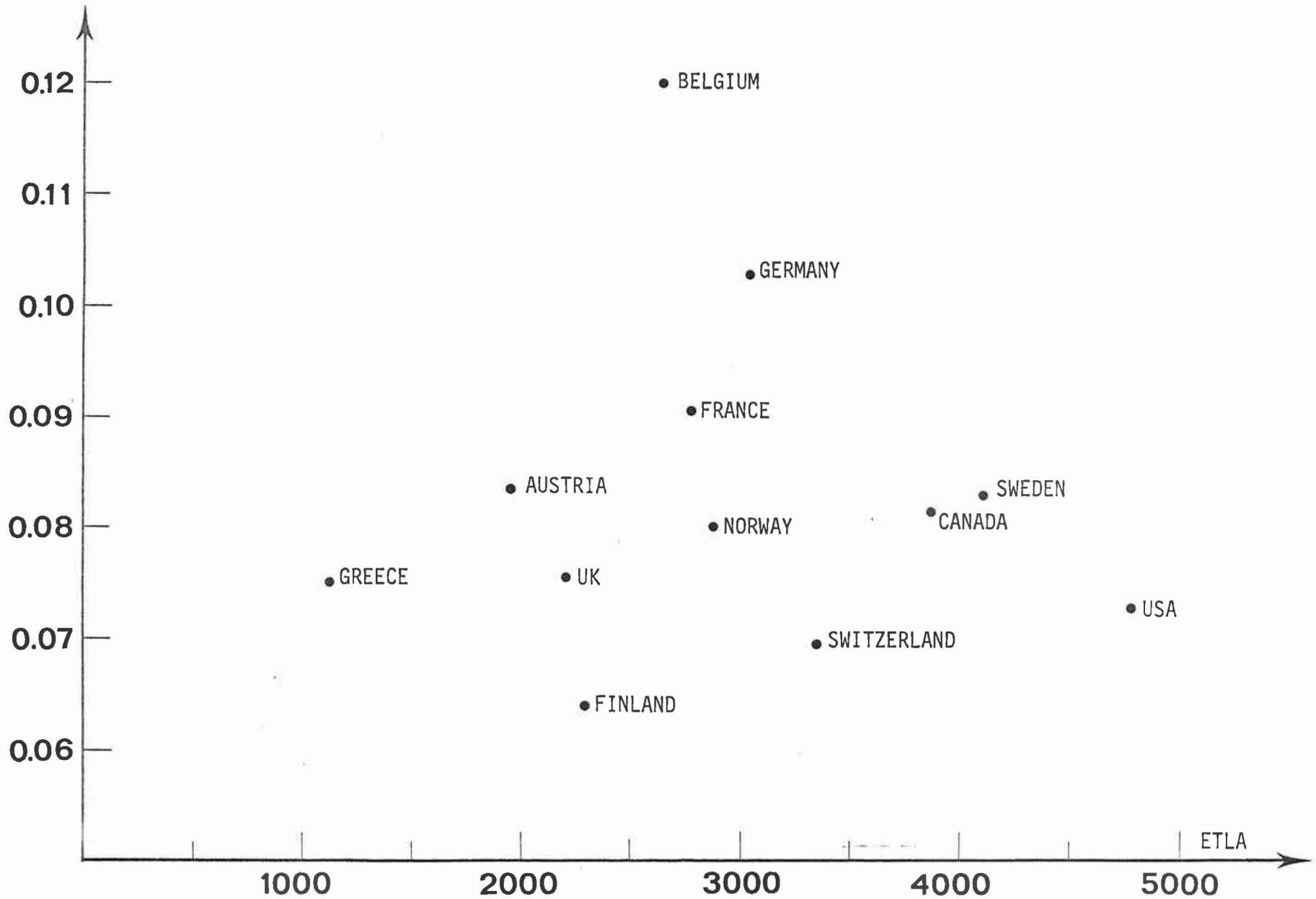
GDP per capita in 1970 U.S. dollars
BKT henkeä kohden Yhdysvaltain dollareissa v. 1970

Figure 5. Budget share of personal care
Kuvio 5. Terveydenhoidon budjettiosuus
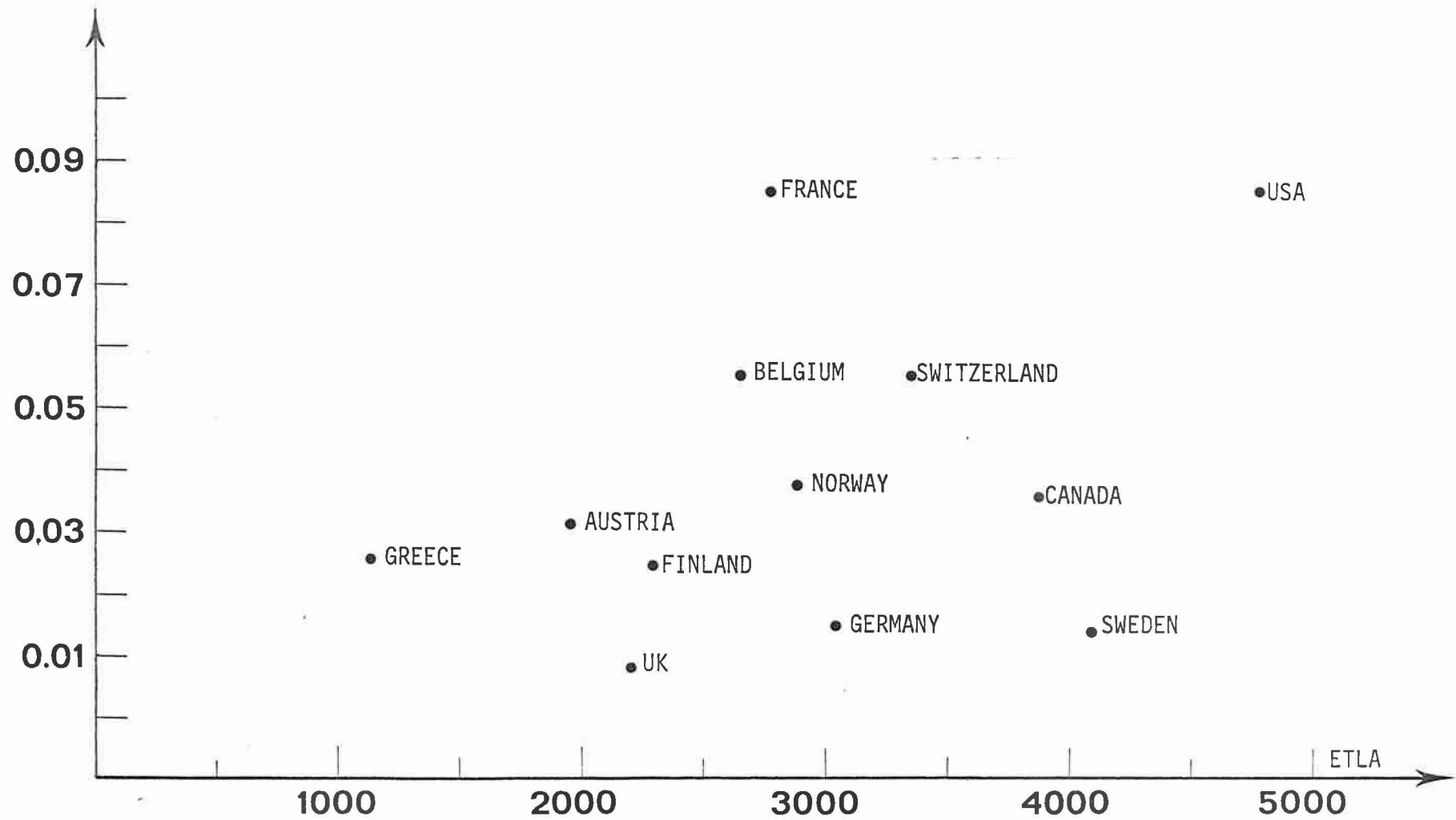
GDP per capita in 1970 U.S. dollars
BKT henkeä kohden Yhdysvaltain dollareissa v. 1970

Figure 6. Budget share of transport
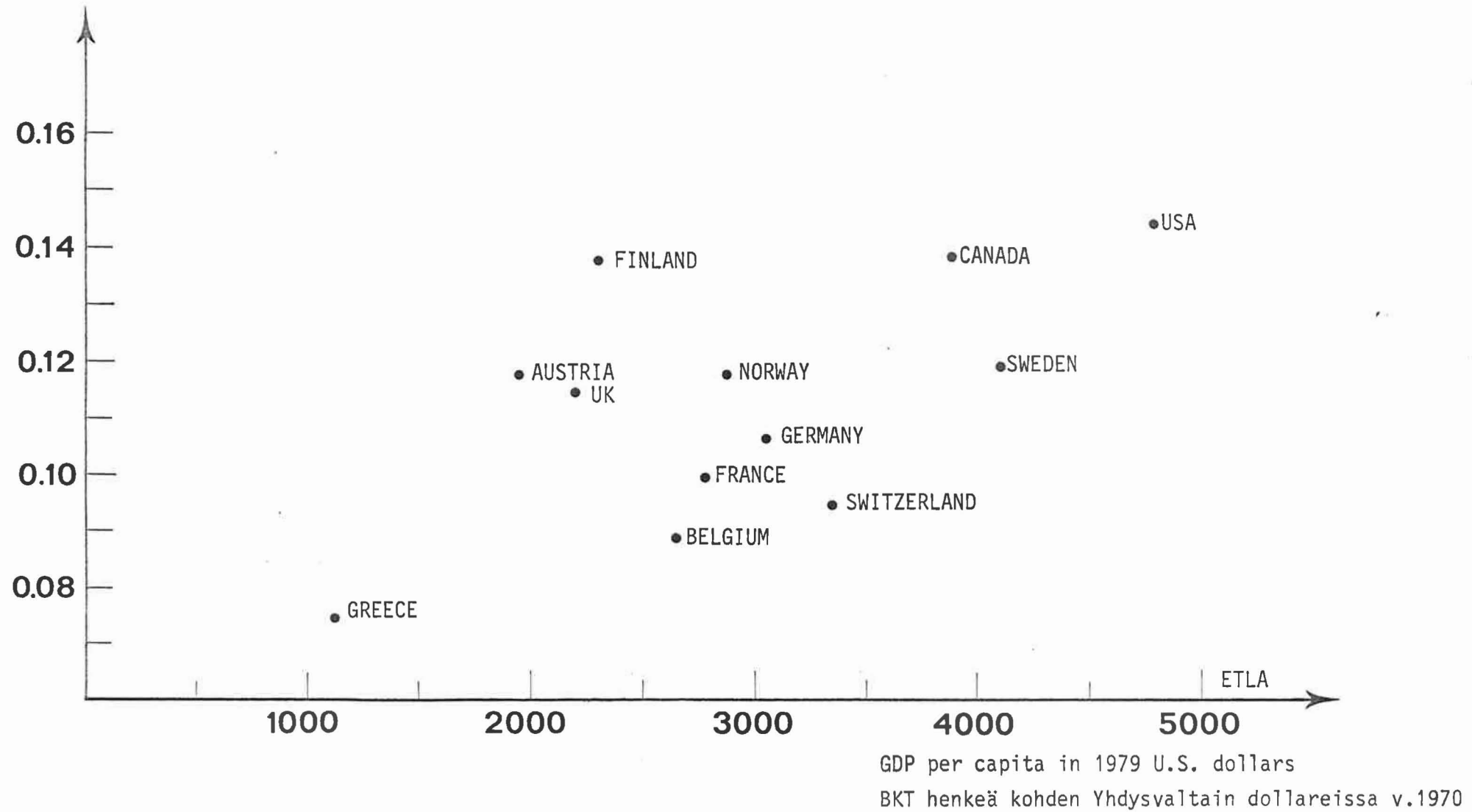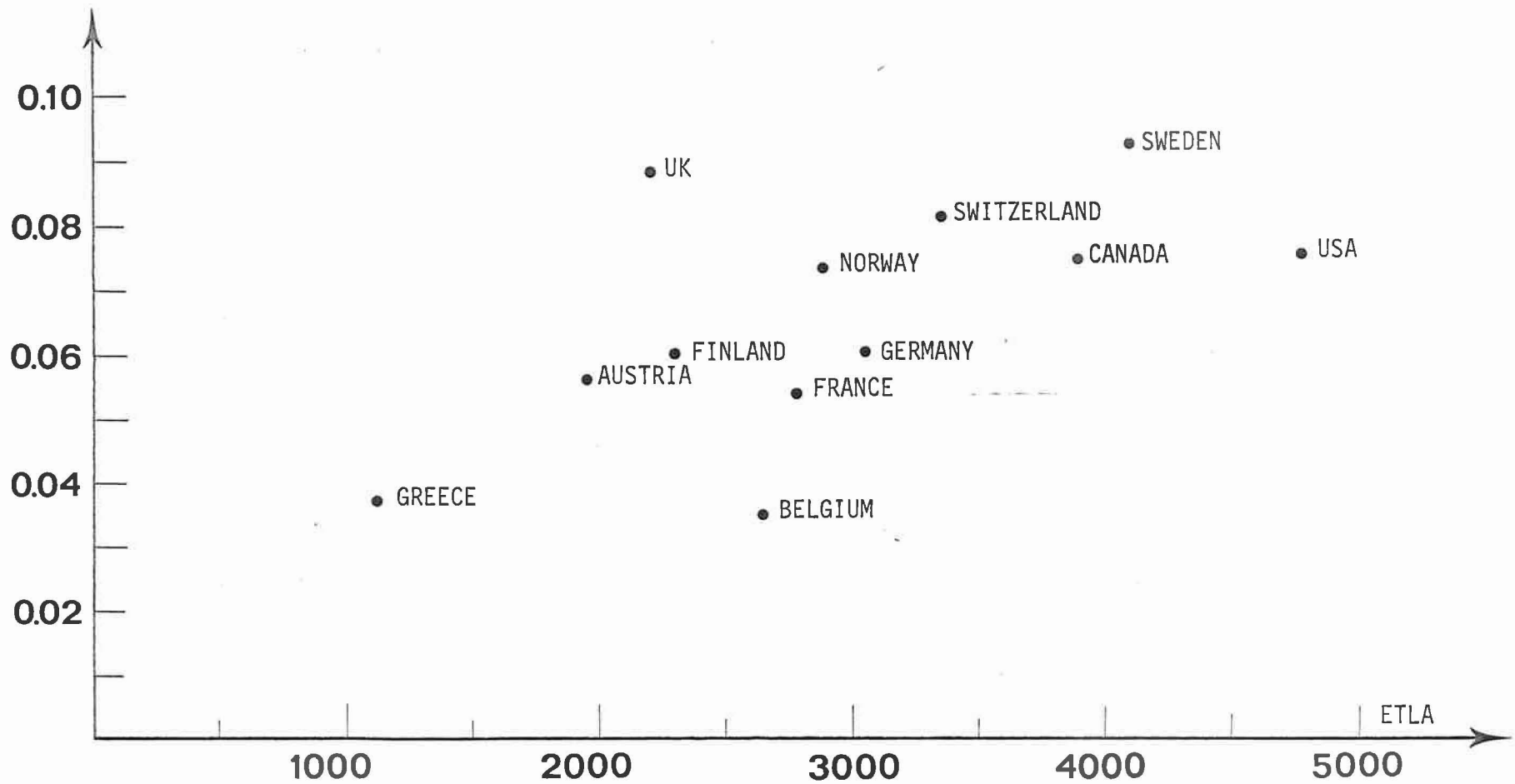Kuvio 6.   Liikenteen budjettiosuus

GDP per capita in 1979 U.S. dollars
BKT henkeä kohden Yhdysvaltain dollareissa v.1970

Figure 7. Budget share of recreation
Kuvio 7. Virkistyksen, kulttuurin ja koulutuksen budjettiosuus

GDP per capita in 1970 U.S. dollars
BKT henkeä kohden Yhdysvaltain dollareissa v. 1970

Figure 8. Budget share of other services
Kuvio 8.   Muiden tavaroiden ja palvelusten budjettiosuus

GDP per capita in 1970 U.S. dollars
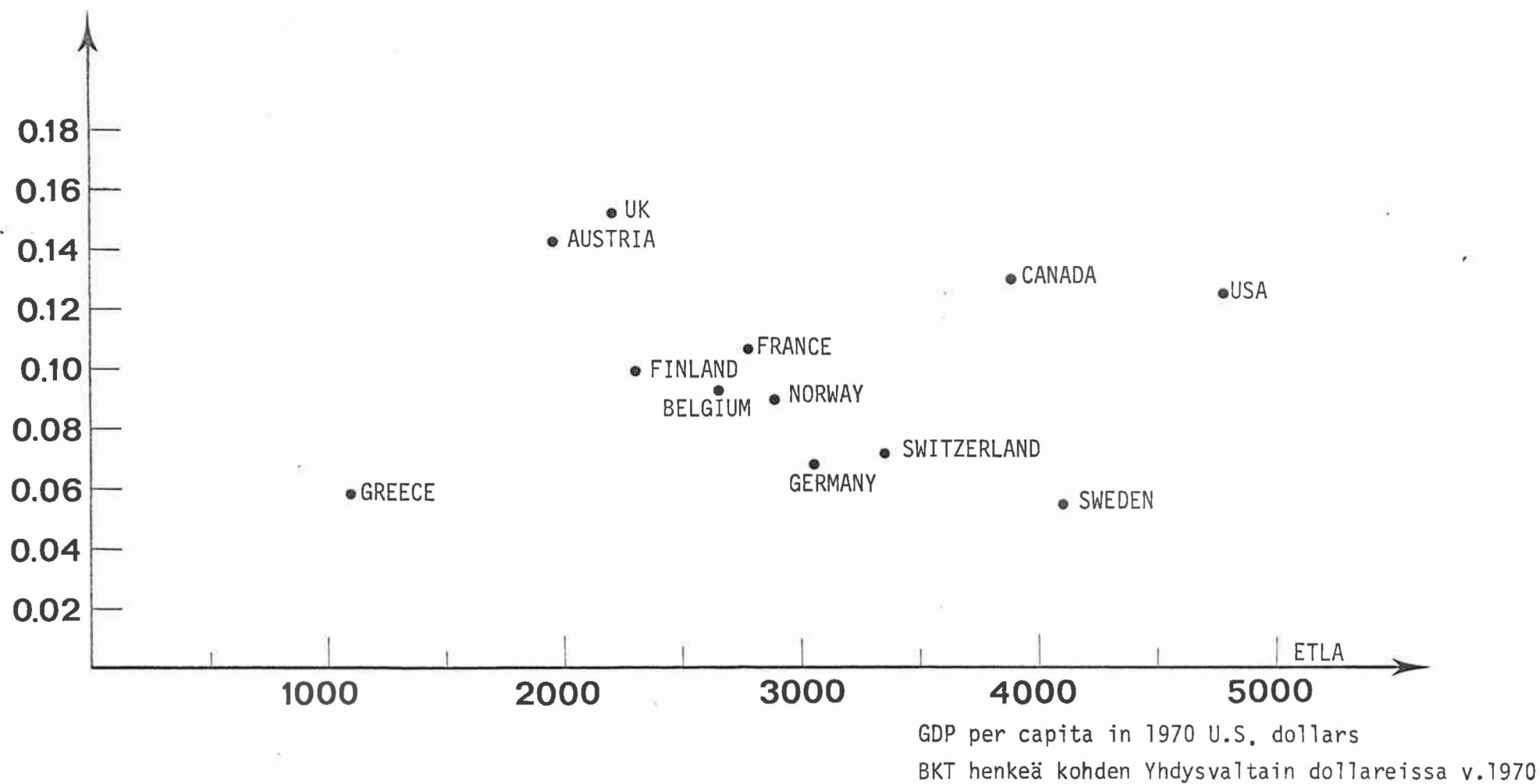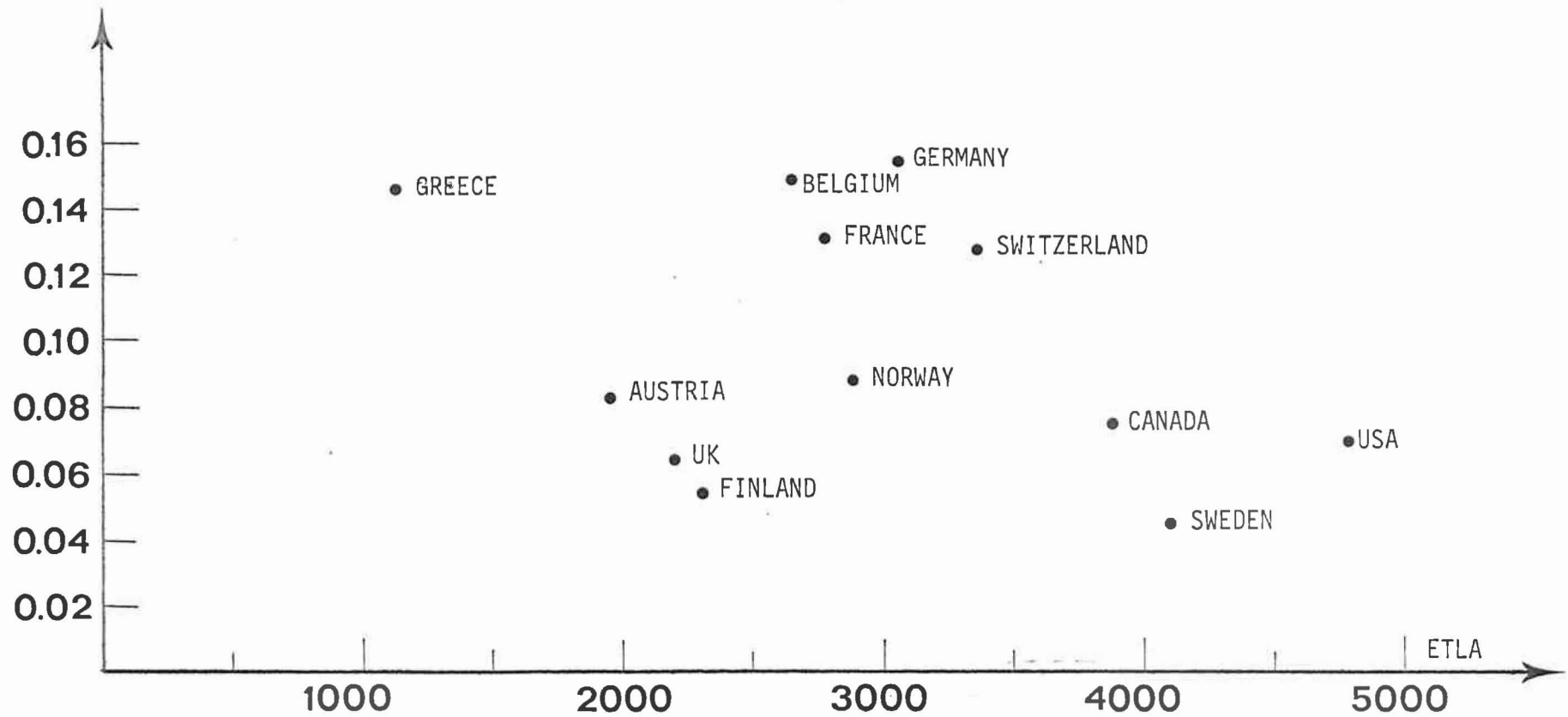BKT henkeä kohden Yhdysvaltain dollareissa v.1970

Figure 9. Budget share of saving (savings ratio)
Kuvio 9. Säästämisen budjettiosuus (säästämisaste)

GDP per capita in 1970 U.S. dollars
BKT henkeä kohden Yhdysvaltain dollareissa v. 1970