STAFF STUDY No. 26

Personal Consumer Expenditures in Canada, 1926-75 Part 2

by

Thomas T. Schweitzer

prepared for the
Economic Council of Canada

PERSONAL CONSUMER EXPENDITURES IN CANADA, 1926-75

Part 2:

Furniture, Furnishings, Household Equipment and Household Operation
Medical Care and Health Expenses
Transportation and Communications

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CONTENTS

1. INTRODUCTION

This is the second part of Staff Study No. 26, and it continues the analysis begun in Part 1.[1] Part 1 dealt with 26 consumer items of three important groups, namely

1. Food, Beverages and Tobacco
2. Clothing, Footwear and Accessories
3. Gross Rent, Fuel and Light.

Part 2 discusses 14 items of the following groups:

4. Furniture, Furnishings, Household Equipment and Household Operation
5. Medical Care and Health Expenses
6. Transportation and Communications.

Part 3, which is forthcoming, will complete the analysis of consumer expenditures by dealing with

7. Recreation, Entertainment and Cultural Services
8. Education
9. Other Goods and Services
10. Net Expenditure Abroad.

In order to keep Part 2 as self-contained as possible, we are repeating, with minor appropriate modifications, Chapters 1 to 3 of Part 1. These chapters deal with the description of the model, and aspects of estimation. Chapters 4 to 8 are new and deal with the analysis and projections of the consumer items to which this Part is devoted.

Chapters 2 and 3, which discuss the method followed and the problems of estimation, are somewhat difficult and technical. For those who wish to skip these chapters and proceed immediately to our findings, beginning in Chapter 4, the following informal introduction may be useful.

The research addressed itself to a deceptively simple problem: if "normal" or "permanent" personal income after taxes (per capita, adjusted for price changes) changes by 1 per cent, by what percentage will consumption of item i change? If the price of item i changes by 1 per cent relative to the price of total consumer expenditure, what will be the percentage change in the consumption of item i? (In the jargon of the professional economist, what are the elasticities of consumption of item i with respect to "income" and to relative price?) Also, what do these elasticities imply for 1975 – provided the potential consumer expenditure described in *Perspective 1975*[2] is realized.

[1] Thomas T. Schweitzer, *Personal Consumer Expenditures in Canada, 1926-75,* Economic Council of Canada Staff Study No. 26, *Part 1,* Ottawa, Queen's Printer, December 1969.
[2] Economic Council of Canada, *Sixth Annual Review, Ottawa, Queen's Printer, 1969.*

The expression "deceptively simple" was used intentionally, because the question immediately arises: elasticities – but over what time period? This problem can be illustrated by an example. Assume that "income" rises in some year in which a great number of automobiles are bought by consumers. They will have now a larger number of new cars – in other words, the (depreciated) stock of new cars in the consumers' hands will be high. Even if the new, higher "income" persists next year, it is unlikely that most of the purchasers of the first year will be in the market for cars again in the second year. We must distinguish between the "short-term" elasticity of consumption – *the instantaneous change* – and the "long-term" elasticity, the new equilibrium level to which consumption of item *i* would settle down, *after all the dynamic reactions to the initial change have worked themselves through the system,* provided that "income" would remain stable into the indefinite future after the initial change. What we observe in our historical data is the result of these two forces – the short-term effect of this year's change and the long-term effect of all previous changes. These forces sometimes counteract and sometimes reinforce each other. Our task was to distinguish and measure them for the purpose of projecting the structure of consumer expenditure.

In general, the short-term elasticities of durables and semidurables are considerably higher than their long-term elasticities. In 1966, the last year included in our historical analysis, the short-term elasticity of the consumption of Household Appliances (item 0430) with respect to "income" was 5.06. The corresponding long-term elasticity was 1.40! One would expect – and this Study confirms it – that in analysing consumption, one must take into account not only current "income" and prices, but also the effects of past consumption, as reflected in the form of stocks in the hands of the consumers and the speed with which these stocks depreciate.

In the case of nondurables and services, the effect of stocks is negligible or nonexistent. Nevertheless here, too, we find that the short- and long-term elasticities differ. It is a case of *habit-formation.* When habit-formation is present, a change of total consumer expenditure does not result in an immediate adjustment of the consumption level of nondurables and services to a new equilibrium. Old habits of consumption linger, and the change goes only part way towards the new equilibrium. Should "income" stabilize at a new and higher level, the consumption of the typical nondurable or service item would continue to rise, though at a decreasing rate, until the effect of past consumption habits has worn off. Only then would the consumption of the nondurable, or service, level off at the new equilibrium. For instance, in the case of Health Services (item 1500) we found that the short-term elasticity with respect to "income" in 1966 was 0.58, while the corresponding long-term elasticity was 1.65.

In Chapter 5, the reader will find a set of statistics: α, β, γ, γ', δ, η, and η'. The symbol α is not meaningful to the nontechnical reader. The meaning of the others is as follows:

β measures the effect of past consumption on current consumption. Generally it is expected to be negative in the case of a durable or semidurable item, and positive in the case of nondurables and services.

γ and γ' measure the short- and long-term effect that a one-dollar change of "income" has on the consumption of the item discussed.

δ is the depreciation rate of the stocks in the hands of consumers (in the case of a durable or semidurable item) or the rate at which past consumption habits wear off (in the case of nondurables and services).

η and η' measure the short- and long-term effect of a one-point change in the relative price of the item discussed on the consumption of that item.

Before turning to the discussion of the individual consumer items, it is advisable to read Chapter 4 and the glossary at the beginning of Chapter 5.

The Dominion Bureau of Statistics recently released its decennial revision of the National Accounts.[3] The publication contains major revisions as far back as 1926. This Study is based on unpublished background data of the revised National Accounts. Chapter 4 of *Perspective 1975,* published in September 1969, contained a summary of consumer-expenditure projections based on the revised data, but this was prepared under considerable time pressure. Findings of the present Study are based on further intensive work and additional information that was not available when *Perspective 1975* was written, and may from time to time deviate somewhat from those reported in the latter publication.

The Houthakker-Taylor[4] model adopted in this Study is only one of the many interesting methods discussed in current economic literature.[5] A comparative evaluation of these methods would be a fascinating and valuable research project that could well repay the considerable time and research input needed. In view of the great dearth of detailed knowledge concerning disaggregated consumer expenditures in Canada, it was thought to be more urgent to have at least the results obtained by the use of one of these modern methods.

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[3]Dominion Bureau of Statistics, *System of National Accounts, National Income and Expenditure Accounts 1926-68,* August 1969.

[4]H. S. Houthakker and Lester D. Taylor, *Consumer Demand in the United States: Analyses and Projections,* Second and Enlarged Edition, Cambridge, Harvard University Press, 1970.

[5]See, e.g., R. Stone, A. Brown, and D. A. Rowe, "Demand Analysis and Projections for Britain: 1900-1970", in *Europe's Future Consumption* (J. Sandee, Ed.), Amsterdam, North-Holland Publishing Co., 1964, Chapter 8; A. P. Barten, "Consumer Demand Functions under Conditions of Almost Additive Preferences", *Econometrica,* Vol. 32, April 1964, pp. 1-38; and C. Almon, *The American Economy to 1975,* New York, Harper & Row, 1966, pp. 24-53.

2. THE MODEL

The approach of our Study is that of Houthakker and Taylor,[6] and can be summarized as follows:

Assume for a start that consumer expenditure for a particular good (or group of goods) – say, automobiles – in time period t is determined by the income of the consumers and by the (depreciated) stock of automobiles held by consumers. (This is an extremely simplified assumption. Refinements will be introduced later on.) The starting assumption can be expressed symbolically as:

$$(1)\quad q_t = \alpha + \beta s_t + \gamma x_t$$

where q_t = consumer expenditures on automobiles in constant (1961) dollars per capita of Canada's population during the time interval from t to $t+1$,

s_t = average depreciated inventory of automobiles in the hands of consumers during the interval in constant dollars per capita,

x_t = personal disposable income in constant dollars per capita during the interval.

s_t is usually not known, but it can be eliminated in the following manner:

$$(2)\quad \Delta^* s_t = q_t - w_t$$

where $\Delta^* s_t$ = change in stock of automobiles in the hands of consumers *during* the time period t,

w_t = using up, or "depreciation" of this stock during the same time interval.

Assume further

$$(3)\quad w_t = \delta s_t$$

where δ is a constant depreciation rate. Substituting (3) into (2) gives

$$(4)\quad \Delta^* s_t = q_t - \delta s_t.$$

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[6] *Op. cit.* This work gives the model both in continuous and discrete form. Our summary is in discrete form. It should be pointed out that our notation differs slightly from that of Houthakker and Taylor.

Rearranging (1) we get

$$(5)\quad s_t = \frac{1}{\beta}(q_t - \alpha - \gamma x_t)$$

and substituting (5) into (4),

$$(6)\quad \Delta^* s_t = (1 - \frac{\delta}{\beta})\, q_t + \frac{\alpha\delta}{\beta} + \frac{\gamma\delta}{\beta} x_t .$$

Lagging equation (1) by one time period

$$(7)\quad q_{t-1} = \alpha + \beta s_{t-1} + \gamma x_{t-1}$$

and subtracting (7) from (1) we obtain

$$(8)\quad q_t - q_{t-1} = \beta(s_t - s_{t-1}) + \gamma(x_t - x_{t-1}).$$

Assume that $s_t - s_{t-1}$ can be approximated in the following manner:

$$(9)\quad s_t - s_{t-1} \simeq \tfrac{1}{2}(\Delta^* s_t + \Delta^* s_{t-1}).$$

(The exact equality holds true if the behaviour of the *s* variable is linear within each time period.) Then

$$(10)\quad q_t - q_{t-1} = \frac{\beta}{2}(\Delta^* s_t + \Delta^* s_{t-1}) + \gamma(x_t - x_{t-1}).$$

Substituting (6) into (10) we obtain

$$(11)\quad q_t - q_{t-1} = \frac{\beta}{2}\left[(1 - \frac{\delta}{\beta}) q_t + \frac{\alpha\delta}{\beta} + \frac{\gamma\delta}{\beta} x_t + (1 - \frac{\delta}{\beta}) q_{t-1} + \frac{\alpha\delta}{\beta} + \frac{\gamma\delta}{\beta} x_{t-1}\right] + \gamma(x_t - x_{t-1}).$$

This can be simplified (provided $\overline{\beta - \delta} \neq 2$) to

$$(12)\quad q_t = \frac{\alpha\delta}{1 - \frac{1}{2}(\beta - \delta)} + \frac{1 + \frac{1}{2}(\beta - \delta)}{1 - \frac{1}{2}(\beta - \delta)} q_{t-1} + \frac{\gamma(1 + \frac{1}{2}\delta)}{1 - \frac{1}{2}(\beta - \delta)} x_t - \frac{\gamma(1 - \frac{1}{2}\delta)}{1 - \frac{1}{2}(\beta - \delta)} x_{t-1}.$$

s_t has disappeared from the equation and the remaining variables are now the directly observable quantities q_{t-1}, x_t and x_{t-1}.

It is convenient to express

$$(13)\quad x_t = x_{t-1} + (x_t - x_{t-1})$$

which leads to

$$(14)\quad q_t = \frac{\alpha\delta}{1 - \frac{1}{2}(\beta - \delta)} + \frac{1 + \frac{1}{2}(\beta - \delta)}{1 - \frac{1}{2}(\beta - \delta)} q_{t-1} + \frac{\gamma\delta}{1 - \frac{1}{2}(\beta - \delta)} x_{t-1} + \frac{\gamma(1 + \frac{1}{2}\delta)}{1 - \frac{1}{2}(\beta - \delta)}(x_t - x_{t-1})$$

or simply

$$(14a)\quad q_t = A_0 + A_1 q_{t-1} + A_2 x_{t-1} + A_3 \Delta x_t .$$

Here Δx_t stands for the difference in *x between* the two time periods *t* and *t*-1. The parameters α, β, γ and δ of equation (1) and (3) can be obtained from the coefficients of (14a) as follows:

(15) $\alpha = \dfrac{2A_0(A_3-\frac{1}{2}A_2)}{A_2(A_1+1)}$

(16) $\beta = \dfrac{2(A_1-1)}{A_1+1} + \dfrac{A_2}{A_3-\frac{1}{2}A_2}$

(17) $\gamma = \dfrac{2(A_3-\frac{1}{2}A_2)}{A_1+1}$

(18) $\delta = \dfrac{A_2}{A_3-\frac{1}{2}A_2}$.

β, γ and δ are of particular interest. β, the stock coefficient, can be expected to be negative in the case of consumer durables. However, β is meaningful also in the case of nondurables and services. It should be recalled that in our calculations we never deal with the variable s directly – we infer its existence from the behaviour of the variables used in (14a) and expect a negative β in the case of durables and semidurables on the basis of practical experience. In fact, s can be regarded as an unspecified "state variable", the coefficient of which will normally have a negative sign in the case of those goods where inventories currently in the hands of consumers have a depressing effect on consumer expenditure in the next time period.

We can also visualize cases in which the state variable would normally have a positive coefficient. Essentially, s_t stands for the (not directly measurable) effect of *past* consumer expenditures on *current* expenditures. This can manifest itself in the form of stocks in the hands of consumers, or in the form of consumers' habits. Consumption theory has long postulated the existence of habit formation, i.e., a relevant variable which is not directly measurable, and which will result in a lagged adjustment of consumption to income changes. (It will be demonstrated later that in most cases this is equivalent to $\beta > 0$.) This is particularly true in the case of nondurables and services. Here the nonmeasurable state variable, which in the case of durables stands for physical stocks, represents habit formation, or a psychological stock of habits. Similarly δ, which in the case of durables and semidurables measures the depreciation rate of physical stocks, measures, in the case of nondurables and services, the depreciation or "wearing off" of consumption habits.

It should be pointed out that the above-mentioned dichotomy between "stock affected" durables and semidurables with negative betas on the one hand and "habit affected" nondurables and services with positive betas on the other is an oversimplication. In most cases both the "stock effect" and the "habit effect" are at work simultaneously in the consumption pattern of any consumption item, and β *measures their joint influence.* It would be desirable to separate the "stock effect" from the "habit effect" but we don't know of any model that can accomplish this.

In the case of durables and to a lesser degree of semidurables the stock effect usually predominates and β is, therefore, negative. However, there are cases when a highly successful new durable product breaks into the market. Then a kind of nation-wide habit formation develops and outweighs the stock effect. In such a case a durable good may show a positive β until the market is "saturated". U.S. experience yields a positive β for radio and television receivers, records and musical instruments.[7] Again, nondurable products and services, which for reasons of technology, social and institutional developments or changes in taste have lost favour with the consuming public and are regarded as inferior, may show negative habit formation and thus a negative β. A U.S. example for such a product group is "fuels other than electricity and natural gas, and ice".[8]

γ measures the short-range effect of a unit change in x on q. Short-range in this context means the time unit of observation – in this Study one calendar year. The long-term effect of a change in x can be also calculated. This is the entire change in consumption caused by a once-for-all change in x, including the lagged effects caused by changes of the state variable.

Let us define long-term equilibrium in which q, s and x all remain constant over time and denote these long-term levels as $\hat{q}$, $\hat{s}$ and $\hat{x}$. Then $\Delta^*\hat{s} = 0$ and it follows from (4)

$$(19)\quad \hat{q} = \delta \hat{s}.$$

Substitution of (19) into (1) yields

$$(20)\quad \hat{q} = \alpha + \frac{\beta}{\delta}\hat{q} + \gamma \hat{x}$$

and assuming $\beta \neq \delta$

$$(21)\quad \hat{q} = \frac{\alpha\delta}{\delta-\beta} + \frac{\gamma\delta}{\delta-\beta}\hat{x}.$$

The derivative of $\hat{q}$ with respect to $\hat{x}$ is then

$$(22)\quad \gamma' = \frac{\gamma\delta}{\delta-\beta},$$

the long-term coefficient.

It should be pointed out that γ and γ' *are not elasticities.*[9] Since equation (1) is a linear model, the elasticities will therefore be different at each point along the curve.[10] However, it is easy to calculate the short- and long-term elasticities once γ and γ' are obtained. In most cases γ and δ will be positive. From this it follows that a negative β (i.e., "stock effect" predominates) will result in $\gamma' < \gamma$, and a positive β (i.e., "habit formation" predominates) in $\gamma' > \gamma$. A positive β is thus equivalent to a lagged adjustment of consumption to income changes, while a negative β implies an initial overshooting of the equilibrium consumption level, followed by subsequent correction.

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[7] Houthakker and Taylor, *op. cit.*, p. 126.

[8] *Ibid.*, p. 90.

[9] The short-term elasticity with respect to x is defined as $\frac{\partial q}{\partial x}\cdot\frac{x}{q}$ and the long-term elasticity as $\frac{\partial \hat{q}}{\partial \hat{x}}\cdot\frac{\hat{x}}{\hat{q}}$. (Here ∂ means the partial derivative. It should not be confused with the depreciation rate of equation (3) and passim.)

[10] In Chapter 5 we have calculated the elasticities for the mean of the historical range and also for the most recent time period of the regression fit (i.e., 1966).

Additional variables can be introduced into an equation of the type (1). For instance, the introduction of relative price p (implicit price deflator of the product group divided by implicit price deflator of total consumer expenditures) leads to

$$(23)\quad q = \alpha + \beta s_t + \gamma x_t + \eta p_t \text{ (the structural equation)},$$

$$(23a)\quad q_t = A_0 + A_1 q_{t-1} + A_2 x_{t-1} + A_3 \Delta x_t + A_4 p_{t-1} + A_5 \Delta p_t \text{ (the estimating equation)}.$$

By analogy we obtain counterparts to (17) and (22):

$$(24)\quad \eta = \frac{2(A_5 - \tfrac{1}{2}A_4)}{A_1 + 1},$$

$$(25)\quad \eta' = \frac{\eta\,\delta}{\delta - \beta} \text{ (see footnote 11).}$$

[11] By analogy to footnote 9 the elasticities with respect to p are $\frac{\partial q}{\partial p}.\frac{p}{q}$ and $\frac{\partial \hat{q}}{\partial \hat{p}}.\frac{\hat{p}}{\hat{q}}$.

3. ASPECTS OF ESTIMATION

The Problem of Over-identification

With the introduction of the additional variable p a complication arises because δ becomes over-identified. In addition to

$$(18)\quad \delta = \frac{A_2}{A_3 - \tfrac{1}{2}A_2},$$

(23) and (23a) yield

$$(26)\quad \delta = \frac{A_4}{A_5 - \tfrac{1}{2}A_4}.$$

These two estimates of δ are not necessarily the same. In order to derive a unique estimate of δ , which yields also a unique estimate of δ and β , we set

$$(27)\quad \frac{A_2}{A_3 - \tfrac{1}{2}A_2} = \frac{A_4}{A_5 - \tfrac{1}{2}A_4}, \quad \text{i.e.,} A_2A_5 = A_3A_4 .$$

This is an additional nonlinear restriction which has to be imposed on equation (23a), when performing our least-squares estimate. The method employed in this Study is that of D. W. Marquardt.[12]

The Problem of Autocorrelation

In estimating least-squares regressions of the type (23a) which contains a lagged dependent variable, one frequently encounters a high degree of autocorrelation in the residuals. This is undesirable for a variety of statistical reasons. Houthakker and Taylor adopted the method developed by L. D. Taylor and T. A. Wilson for dealing with this problem.[13]

To summarize its essential point, we assume that the error term u_t of equation (23a) can be approximated by the expression

$$(28)\quad u_t = \lambda u_{t-1} + \epsilon_t$$

[12] D. W. Marquardt, "An Algorithm for Least-Squares Estimation of Nonlinear Parameters", *Journal of the Society for Industrial and Applied Mathematics*, Vol. I, No. 2, June 1963.

[13] For a detailed description see L. D. Taylor and T. A. Wilson, "Three Pass Least Squares: A Method for Estimating Models with a Lagged Dependent Variable", *Review of Economics and Statistics*, Vol. XLVI, No. 4, Nov. 1964.

where ϵ_t is independently distributed, i.e., $E(\epsilon_t \epsilon_{t'}) = 0$ for all t and t' $(t \neq t')$. The method consists of computing a time-series for u_{t-1} (hereafter referred to as the three-pass variable) and introducing it as an additional variable in (23a).[14]

When preparing a projection, the value of the three-pass variable for the first projection time unit can be obtained from the last observation of the historical period. For subsequent time units the historical mean of the three-pass variable should be used.[15]

Special Cases

Equation (23a) is a very flexible framework for analysing consumer expenditure. This can be demonstrated by discussing some special cases, many of which we have encountered in our work:

1) $A_1 = 1$.
This implies $\beta = \delta$. See equations (16) and (18). In this case q_{t-1} can be carried over to the left side of the equation (23a) and the equation is estimated with Δq as dependent variable. The long-run coefficients γ' and η' and the corresponding elasticities can no longer be estimated, due to the required division by $\delta - \beta$ in equation (22). The equation, however, can still be used for projection purposes.

2) $A_2 = A_4 = 0$.
This implies $\delta = 0$. See equation (18). In this case omit x_{t-1} and p_{t-1} and the constant term from the equation. The long-run interpretation breaks down, because according to (21) this case implies $\hat{q} = 0$, which is implausible.

3) $A_1 \doteq 0$.
This implies $\delta = \beta + 2$. See equation (16). If this occurs when $A_2 = A_3$ and $A_4 = A_5$ (see below), the case reduces itself to an ordinary static equation.

4) $A_2 = A_3, A_4 = A_5$.
This implies $\delta = 2$. Only current income and price are included in the equation. Equation (19) shows that δ can also be regarded as a consumption-inventory ratio. In this case $\delta = 2$ would arise when a commodity of the lifetime of one year is bought once a year.
A more useful interpretation, however, is the following: Houthakker and Taylor have demonstrated[16] that $\delta = 2$ is equivalent to the classical distributed-lag model of Koyck,

$$(29) \quad q_t = \alpha + \beta \sum_{i=0}^{\infty} \psi^i x_{t-i}.$$

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[14]The three-pass method, for which Houthakker and Taylor claim good small-sample properties, has been subject to criticism in recent statistical literature. Nevertheless, the second edition of Houthakker and Taylor, in which they re-estimate their equations on the basis of the revised U.S. National Accounts data, uses the three-pass method.

[15]Houthakker and Taylor, *op. cit.*, p. 46.

[16]*Ibid.*, pp. 24-26.

5) $A_3 = A_5 = 0$.

This implies $\delta = -2$. Only lagged values of income and price are included in the equation. This is equivalent to the Koyck-type model

$$(30) \quad q_t = \alpha + \beta \sum_{i=1}^{\infty} \psi^{i-1} x_{t-i} .$$

In this case the short-term income coefficient can be negative and the long-term coefficient positive.

6) δ is very large.

This is the "Bergstrom case"[17] (named after A. R. Bergstrom of the London School of Economics), which arises when A_2 (A_4) does not significantly differ from $2A_3$ ($2A_5$). It is equivalent to a model which assumes that the consumer is attempting to change his actual level of consumption towards a desired level which is determined by his income (and by other relevant variables). This can be expressed in algebraic form as:

$$(31) \quad \Delta q = \theta(\tilde{q} - q)$$
$$\tilde{q} = \xi + \mu x$$

where $\tilde{q}$ is the desired level of consumption. Assuming

$$(32) \quad q_t - q_{t-1} = \tfrac{1}{2}(\Delta^* q_t + \Delta^* q_{t-1})$$

the estimating equation becomes

$$(33) \quad q_t = A_0 + A_1 q_{t-1} + A_2 (x_t + x_{t-1}) .$$

From (33) follows that

(34) the constant term $\xi = \dfrac{A_0}{1 - A_1}$

(35) the adjustment coefficient $\theta = \dfrac{2(1 - A_1)}{1 + A_1}$

(36) the income coefficient $\mu = \dfrac{2A_2}{1 - A_1}$.

After inclusion of the price term, the estimating equation becomes

$$(37) \quad q_t = A_0 + A_1 q_{t-1} + A_2 (x_t + x_{t-1}) + A_3 (p_t + p_{t-1})$$

and by analogy to (36)

(38) the price coefficient $\lambda = \dfrac{2A_3}{1 - A_1}$

[17] *Ibid.*, pp. 26-27.

4. THE DATA FOR ESTIMATION AND PROJECTION

The data on consumption are on a per capita constant (1961) dollar basis. The source of the data is the 1969 historical revision of the DBS National Income and Expenditure Accounts.[18] The DBS available series were disaggregated by us, with the help of certain unpublished DBS data as a guide. Our disaggregation does not necessarily reflect the judgment of DBS on the quality of the data at the level of aggregation being used in the present Study. The method in this Study is that of time series analysis, using in the main the period 1926-66, with the war years 1940-45 omitted. In a few instances where circumstances justified it, additional years were omitted. These cases will be clearly indicated in the discussion of the individual consumer items.

The most important independent variable, x, is total consumer expenditure per capita, in constant dollars. This is a better approximation to "normal" or "permanent" income than is the "measured" income reported by DBS.[19]

Starting with 1961 it was necessary to make an adjustment to the published DBS personal consumer expenditure data. From 1961 on, DBS has transferred a part of medical care and health expenses from personal consumer expenditures to government expenditures. This causes a discontinuity in the published personal consumer data. To avoid the discontinuity, we have transferred hospital insurance and medicare back into personal consumer expenditure.

In this Study, p stands for the relative price of the product group investigated, i.e. the implicit price deflator of the group divided by the implicit price deflator of total consumption expenditure.

We made frequent use of a dummy variable d with the value 0 in the 1926-39 period and with the value 1 in 1946-66. This dummy variable is assumed to measure the influence of social, institutional and taste changes between the prewar and postwar period.

The three-pass least-squares method was adopted whenever the coefficient of the three-pass variable was larger than its standard error or if the Durbin-Watson statistic of ordinary least squares was outside the range 1.6 and 2.4. This occurred in 10 instances out of 14 consumer items.

Whenever additional variables have been used, their explanation will be given in the discussion of the individual product group.

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[18] In classifying consumer expenditure items and deciding which should be regarded as durables, semidurables, nondurables or services, DBS has in the main followed the recommendations of the United Nations document: *Proposal for Revising the SNA*, 1952, E/CN. 3/345.

[19] For the concept of permanent income see M. Friedman, *The Theory of the Consumption Function*, Princeton, Princeton University Press, 1957.

Personal Consumer Expenditures

In general, we retained a variable whenever its coefficient was larger than its standard error. However, this rule was not observed rigidly, but tempered by judgment. Also, a variable was omitted if the sign of its coefficient was judged incorrect on basic theoretical reasoning. The most frequent occurrence of this kind was that of a positive coefficient for *p*.[20]

Projections of the individual consumption items by our equations would not forcibly add up to total consumption, even if we had derived equations for all components of consumer expenditure. A method to solve this problem by adjusting total consumer expenditure until the components add up to the original unadjusted consumer expenditure is described in Houthakker and Taylor.[21]

TABLE 1

VALUES OF INDEPENDENT VARIABLES, 1969 AND 1975

Variable	1969	1975	Method of Extrapolation
x (in 1961 dollars)	$1,862.19	$2,355.50*	exponential
p of item 0420 Household Textiles & Other Furnishings	94.8	89.4	linear
0440 Glassware, Tableware & Household Utensils	99.8	99.8	"
0450 Household Operation Goods	97.2	99.7	"
1450 Household Operation Services	115.0	127.0	"
0510 Medical & Pharmaceutical Products	78.8	69.8	"
0610+0622+0623 Personal Transportation Equipment, Auto Repairs & Maintenance, Auto Parts & Accessories	87.0	85.2	"
0621 Gasoline, Oil & Grease	96.8	90.2	"
1630 Purchased Transportation	116.3	128.9	"
1640 Communications	88.3	85.3	"
Non-apartment dwellings completed per 1,000 population	4.60	4.05	"
Marriages per 1,000 population	8.65	9.65	"
Passenger car registrations per 1,000 population	307.96	356.00	"

*This value is equivalent to that given in 1967 dollars in *Perspective 1975, op. cit., p. 55.*

20 We have calculated only the standard errors of the coefficients of the estimating equations. It would be, of course, desirable to obtain also the standard errors of the structural equations, but lack of time and resources have made this impossible.

21 *Op. cit.*, pp. 52-54.

Our regression analysis is based on the period 1926-66. We have omitted from our analysis the available data for 1967-69 in order to be able to test the forecasting ability of our regressions (see Chapter 7). However, we have used the 1969 DBS data as the starting point of our projections to 1975.

To prepare these projections, it was necessary to make certain assumptions regarding the future course of the independent variables. These assumptions are summarized in Table 1. The historic means of the three-pass variables, needed for projection purposes, are to be found in Table 2.

TABLE 2

HISTORIC MEAN OF THE THREE-PASS VARIABLES

Item	Mean
0411+0413 Furniture, Upholstery & Furniture Repair	+2.07
0420 Household Textiles & Other Furnishings	−0.13
0440 Glassware, Tableware & Household Utensils	+0.13
0450 Household Operation Goods	+0.60
1450 Household Operation Services	−4.09
0510 Medical & Pharmaceutical Products	−0.32
0610+0622+0623 Personal Transportation Equipment, Auto Repairs & Maintenance, Auto Parts & Accessories	+2.79
0621 Gasoline, Oil & Grease	+1.19
1620 Operation of Personal Transportation Equipment	−2.64
1630 Purchased Transportation	−0.20

The DBS consumer expenditure data contain much valuable and useful material. At the same time DBS would be the first to agree that there is scope for improvement, particularly at the widely disaggregated level. In general, DBS follows the reasonable practice of devoting more resources to the estimation of big and important consumer items than to the smaller ones. While in theoretical economic work it is not regarded as fair play to criticize the underlying data, in applied work it is necessary to point out such weaknesses in order to warn the private and public policy-makers. We shall point out some of our doubts in the discussion of the individual consumer items. Two general remarks have to be made, however, at the very beginning.

First, current dollar expenditures on the individual consumption items as reported by DBS do *not* contain the retail sales tax. The price deflators, on the other hand, *do* contain the tax. To this extent the real expenditures on items subject to the tax are under-reported.

Second, total consumer expenditure contains an item called "Miscellaneous Goods and Adjusting Entries". Under this heading are reported (among others) those consumer expenditures that DBS cannot at this time – for one reason or another – assign to the individual disaggregated items. This item has grown very rapidly since 1951:

MISCELLANEOUS GOODS AND ADJUSTING ENTRIES

	Index 1961=100
1951	46.9
1961	100.0
1969	479.0

Ultimately a large part of "Miscellaneous Goods" will be assigned to individual consumer items. In the meantime, however, these items remain under-reported.

5. EXPENDITURE EQUATIONS AND PROJECTIONS FOR DETAILED ITEMS OF EXPENDITURE

Glossary

d.	durable consumer good expenditure.
s.d.	semidurable consumer good expenditure.
n.d.	nondurable consumer good expenditure.
s.	consumer service expenditure.
q_t	consumer expenditure on the item in question in constant (1961) dollars per capita in year t.
Δq_t	$q_t - q_{t-1}$
x_t	total consumer expenditure in constant (1961) dollars in year t.
Δx_t	$x_t - x_{t-1}$
p_t	relative price of the item in year t (1961=100), i.e., implicit price index of the item divided by the implicit price index of total consumer expenditure multiplied by 100.
Δp_t	$p_t - p_{t-1}$.
d_t	prewar-postwar dummy (takes value 0 in the period 1926-39 and value 1 in the period 1946-66).
z_t	three-pass variable.
$\bar{R}^2$	coefficient of multiple determination corrected for degrees of freedom.
S.E.E.	standard error of estimate.
D-W	Durbin-Watson coefficient.
α	intercept in structural equation.
β	state variable coefficient in structural equation.
γ	short-run total consumer expenditure coefficient of structural equation.
γ'	long-run total consumer expenditure coefficient of structural equation.
δ	depreciation rate.
η	short-run relative price coefficient of structural equation.

Personal Consumer Expenditures

η' long-run relative price coefficient of structural equation.

ξ intercept in Bergstrom model.

θ adjustment coefficient in Bergstrom model.

μ total consumer expenditure coefficient in Bergstrom model.

λ relative price coefficient in Bergstrom model.

A_0 intercept in estimating equation.

A_1 coefficient of q_{t-1} in estimating equation.

A_2 coefficient of x_{t-1} in estimating equation.

A_3 coefficient of Δx_t in estimating equation.

A_4 coefficient of p_{t-1} in estimating equation.

A_5 coefficient of Δp_t in estimating equation.

A_6 coefficient of d_t in estimating equation.

A_7 coefficient of z_t in estimating equation.

A_8 coefficient of other variables in estimating equation.

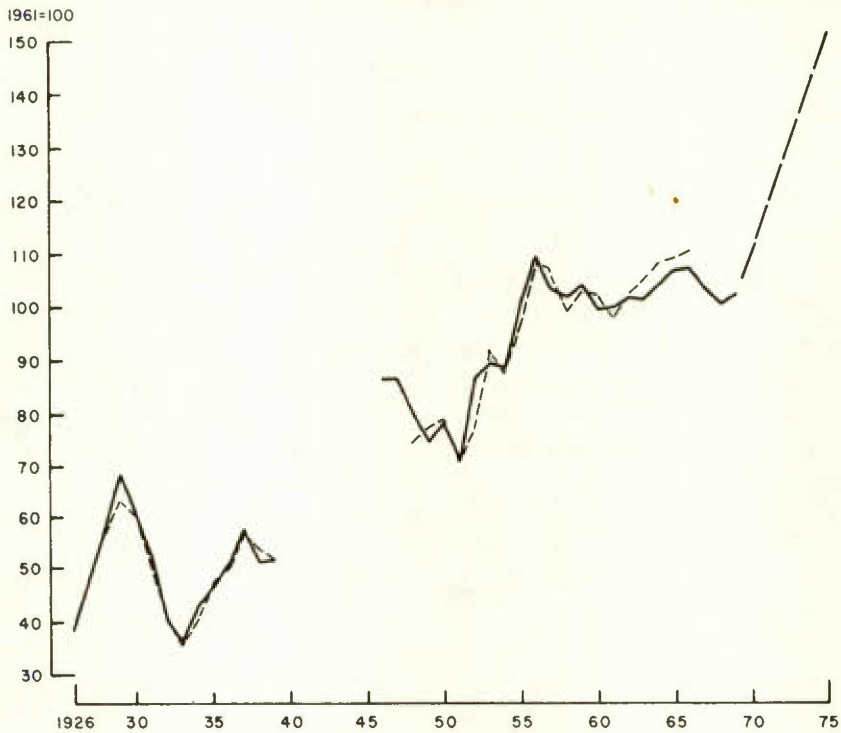
Numbers in parentheses under coefficients are the respective standard errors.

——— Solid line on charts = observed magnitudes.

- - - - - - Short broken line on charts = calculated historical magnitudes.

— — Long broken line on charts = projected magnitudes.

0411 + 0413 FURNITURE, UPHOLSTERY AND FURNITURE REPAIR (d.)



$$q_t = +\ 0.94020 q_{t-1} + 0.04072 \Delta x_t - 0.75496 d_t + 0.38652 z_t$$

(0.03342) (0.00429) (0.42071) (0.22568)

$\alpha =$ 0		$\bar{R}^2$	= 0.981
$\beta =$ − 0.0616		*S.E.E.*	= 0.72
$\gamma =$ + 0.0420	$\gamma' =$	*D-W*	= 2.02
$\delta =$ 0			
$\eta =$	$\eta' =$		

Consumption Elasticities

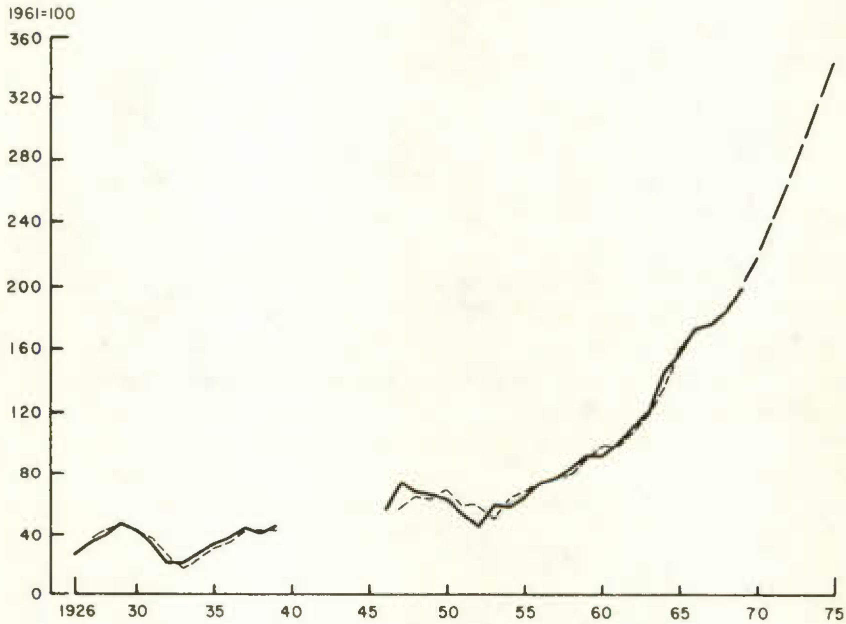
with respect to	short-term	long-term
x at mean	+ 2.67	
x in 1966	+ 2.93	
p at mean		
p in 1966		

	Real Consumption (1961 = 100) per capita	aggregate
1969	102.4	118.3
1975	151.8	193.8
1975/1969	+ 48.2%	+ 63.9%

The coefficients of x_{t-1} and of the p terms were smaller than their respective standard errors and/or had the wrong sign. This led to $\delta = 0$ (see equation 18 on p. 7), but in this case no long-term elasticities can be calculated (see special case 2 on p. 12). A depreciation rate of zero may seem odd, but it is worth noting that a very low rate (0.0366) was found also for the United States.[22] β is negative, as expected in the case of durable goods. The high short-term elasticities with respect to x are noteworthy.

[22] Houthakker and Taylor, *op. cit.*, p. 80.

0412 CARPETS AND OTHER FLOOR COVERINGS (d.)



$$q_t = -1.15617 + 0.93417q_{t-1} + 0.00186x_{t-1} + 0.00879\Delta x_t - 0.76624d_t$$

$$(0.59803) \quad (0.09806) \quad (0.00108) \quad (0.00198) \quad (0.37066)$$

$\alpha = 5.0340$ $\qquad \bar{R}^2 = 0.978$

$\beta = +\ 0.1694$ $\qquad S.E.E. = 0.37$

$\gamma = +\ 0.0081$ $\qquad \gamma' = +\ 0.0283$ $\qquad D\text{-}W = 1.71$

$\delta = +\ 0.2375$

$\eta =$ $\qquad \eta' =$

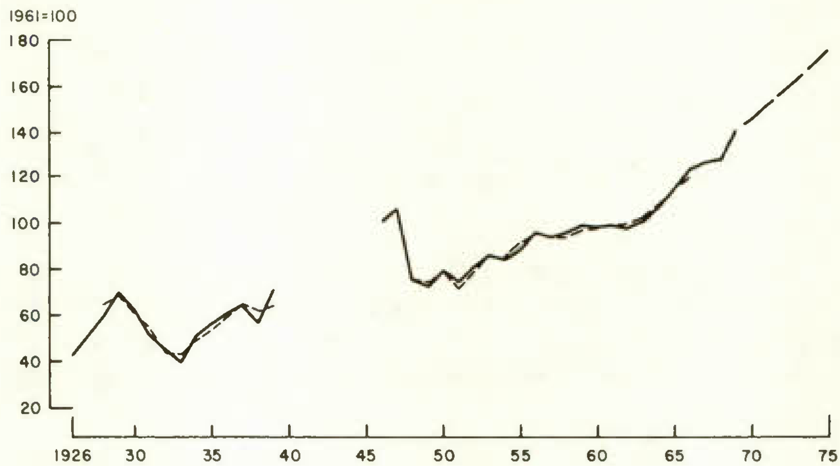
Consumption Elasticities

with respect to	short-term	long-term
x at mean	+ 2.00	+ 6.98
x in 1966	+ 1.23	+ 4.30
p at mean		
p in 1966		

	Real Consumption (1961 = 100)	
	per capita	aggregate
1969	199.2	230.0
1975	343.1	437.9
1975/1969	+ 72.2%	+ 90.4%

The consumption of this item shows a strong, upward-sweeping trend. This may account for the positive β – an unusual occurrence in the case of a durable good. The coefficients of the p variables were positive and smaller than their standard errors. The projected increase in consumption between 1969 and 1975 is the highest one in this Staff Study.

0420 HOUSEHOLD TEXTILES AND OTHER FURNISHINGS (s.d.)



$$q_t = +\ 0.88931 + 0.71993 q_{t-1} + 0.00158 x_{t-1} + 0.01482 \Delta x_t$$
$$(0.42587) \quad (0.11855) \quad (0.00078) \quad (0.00184)$$
$$-\ 0.00483 p_{t-1} - 0.04531 \Delta p_t - 0.37176 d_t - 0.47094 z_t$$
$$(0.00292) \quad (0.02172) \quad (0.23007) \quad (0.18904)$$

$\alpha = +\ 9.1909$		$\bar{R}^2 = 0.981$
$\beta = -\ 0.2132$		$S.E.E. = 0.28$
$\gamma = +\ 0.0163$	$\gamma' = +\ 0.0056$	$D\text{-}W = 1.81$
$\delta = +\ 0.1125$		
$\eta = -\ 0.0499$	$\eta' = -\ 0.0172$	

Consumption Elasticities

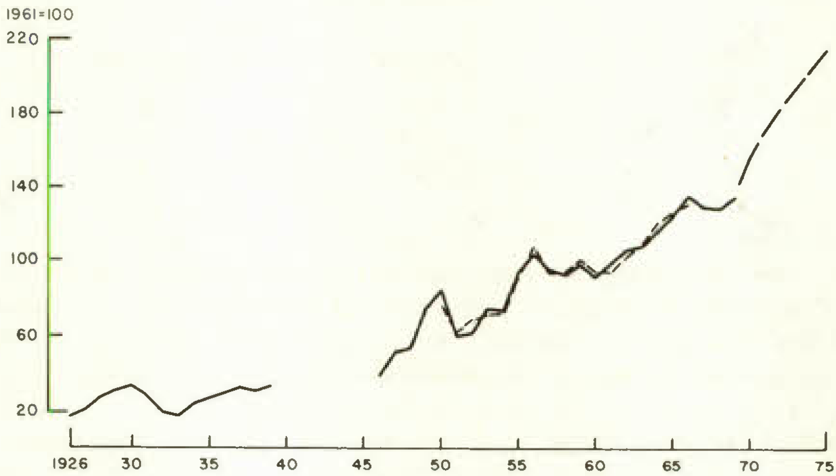
with respect to	short-term	long-term
x at mean	+ 2.34	+ 0.81
x in 1966	+ 2.41	+ 0.83
p at mean	− 0.66	− 0.23
p in 1966	− 0.44	− 0.15

Personal Consumer Expenditures

	Real Consumption (1961 = 100)	
	per capita	aggregate
1969	140.6	162.4
1975	175.7	224.3
1975/1969	+ 25.0%	+ 38.2%

This is an attractive equation. The coefficients are reasonable (including the negative beta we should expect in the case of a semidurable item) and the fit is tolerably good. The high short-term elasticity with respect to x seems intuitively right and so does the fact that the long-term elasticity is lower than unity.

0430 HOUSEHOLD APPLIANCES (d.)



$$q_t = -\ 11.93204 + 0.44568 q_{t-1} + 0.01161 x_{t-1} + 0.06056 \Delta x_t$$
$$\quad (2.88444) \quad (0.15110) \quad (0.00330) \quad (0.00997)$$
$$+\ 0.94316\ (\text{non-apartment dwelling units completed/1,000 population})_t$$
$$(0.27203)$$

$\alpha = -\ 77.8443$		$\bar{R}^2 = 0.959$
$\beta = -\ 0.5548$		$S.E.E. = 0.80$
$\gamma = +\ 0.0757$	$\gamma' = +\ 0.0209$	$D\text{-}W = 1.84$
$\delta = +\ 0.2121$		
$\eta =$	$\eta' =$	

Consumption Elasticities

with respect to	short-term	long-term
x at mean	+ 5.54	+ 1.53
x in 1966	+ 5.06	+ 1.40
p at mean		
p in 1966		

Real Consumption
(1961 = 100)

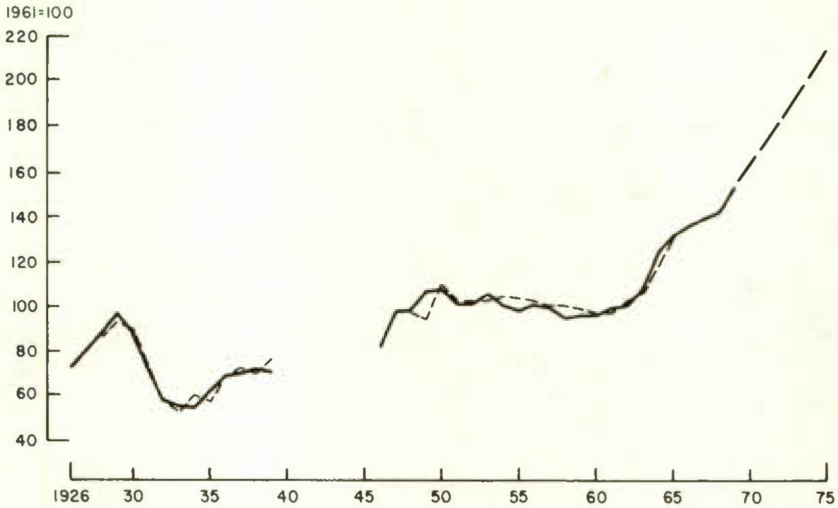
	per capita	aggregate
1969	135.7	156.7
1975	214.7	274.1
1975/1969	+ 58.2%	+ 74.9%

This group consists of refrigerators, freezers, washing machines, dryers, stoves and ranges, vacuum cleaners, sewing machines, air conditioners, power lawnmowers, all other appliances and their repair. It was found that the completion of dwelling units other than apartments[23] has a significant effect on consumer expenditure on appliances. (In the case of apartments, the appliances supplied by the landlord count as investment, not as consumer expenditure.) Data on the completion of dwelling units by apartments and non-apartments are available only from 1949 onwards, so the period prior to 1949 had to be omitted from our regression.

Interestingly enough, the inclusion of dwelling completions resulted in non-significant coefficients for the p terms, which were in consequence deleted. The strong stock-effect reflected in the beta is noteworthy; the depreciation rate seems somewhat too high for a group which consists largely of stoves, ranges and refrigerators – all goods with relatively long life. The short-term elasticity with respect to x is remarkable; it is the highest one (at the mean) among all the items analysed in Parts 1 and 2 of this Study. The long-term elasticity is larger than unity, as one should expect.

[23] I.e. single, semi-detached, duplex and row housing units.

0440 GLASSWARE, TABLEWARE AND HOUSEHOLD UTENSILS (s.d.)



$$q_t = +\ 0.76347q_{t-1} + 0.00210x_{t-1} + 0.00955\Delta x_t - 0.01896p_{t-1}$$
$$\quad (0.12900) \qquad (0.00106) \qquad (0.00228) \qquad (0.01222)$$
$$- 0.08626\Delta p_t - 0.5639d_t + 0.2336\,(\text{marriages per 1,000 population})_t$$
$$\quad (0.03580) \qquad (0.0500) \qquad (0.1267)$$
$$+ 0.1140z_t$$
$$\quad (0.2650)$$

$\alpha = 0$		$\bar{R}^2 = 0.952$
$\beta = -\ 0.0213$		$S.E.E. = 0.43$
$\gamma = +\ 0.0096$	$\gamma' = +\ 0.0089$	$D\text{-}W = 2.08$
$\delta = +\ 0.2470$		
$\eta = -\ 0.0871$	$\eta' = -\ 0.0802$	

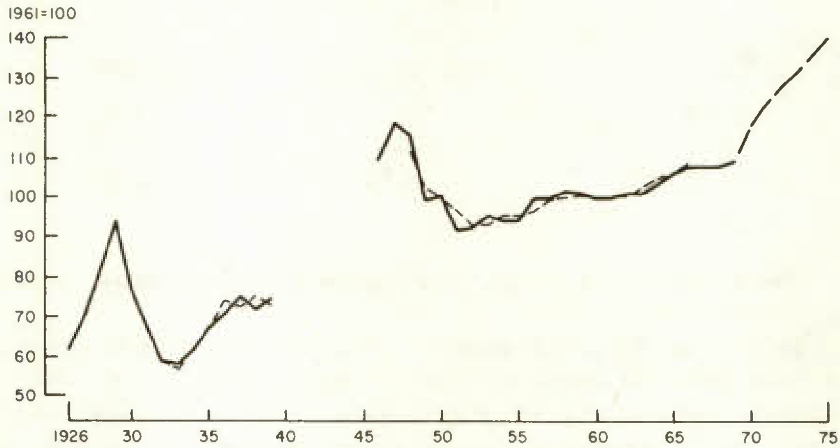
Consumption Elasticities

with respect to	short-term	long-term
x at mean	+ 1.22	+ 1.12
x in 1966	+ 1.29	+ 1.18
p at mean	− 0.96	− 0.89
p in 1966	− 0.68	− 0.63

	Real Consumption (1961 = 100)	
	per capita	aggregate
1969	153.3	177.0
1975	214.1	273.3
1975/1969	+ 39.6%	+ 54.4%

This group contains china, glassware, crockery and pottery, lamps, light bulbs and fixtures, silver flatware and hollow-ware, and garden tools. The marriage rate was introduced into the equation above because of the assumption that in many families a substantial part of this consumer item is bought, or is received as a present, at marriage. β is negative, as expected in the case of semidurable goods, but the stock-effect is quite low.

0450 HOUSEHOLD OPERATION GOODS (n.d.)



$$q_t = +\ 21.22202 + 0.35636q_{t-1} + 0.00592x_t - 0.21076p_t + 1.73686d_t$$
$$(3.34595) \quad (0.10041) \quad (0.00081) \quad (0.03553) \quad (0.59683)$$
$$+\ 0.17363z_t$$
$$(0.21654)$$

$\alpha = +\ 15.6464$		$\bar{R}^2 = 0.978$
$\beta = +\ 1.0509$		$S.E.E. = 0.40$
$\gamma = +\ 0.0044$	$\gamma' = +\ 0.0092$	$D\text{-}W = 2.51$
$\delta = +\ 2$		
$\eta = -\ 0.1554$	$\eta' = -\ 0.3274$	

Consumption Elasticities

with respect to	short-term	long-term
x at mean	+ 0.33	+ 0.70
x in 1966	+ 0.41	+ 0.87
p at mean	− 0.98	− 2.07
p in 1966	− 0.88	− 1.87

	Real Consumption (1961 = 100)	
	per capita	aggregate
1969	109.3	126.3
1975	140.0	178.7
1975/1969	+ 28.0%	+ 41.6%

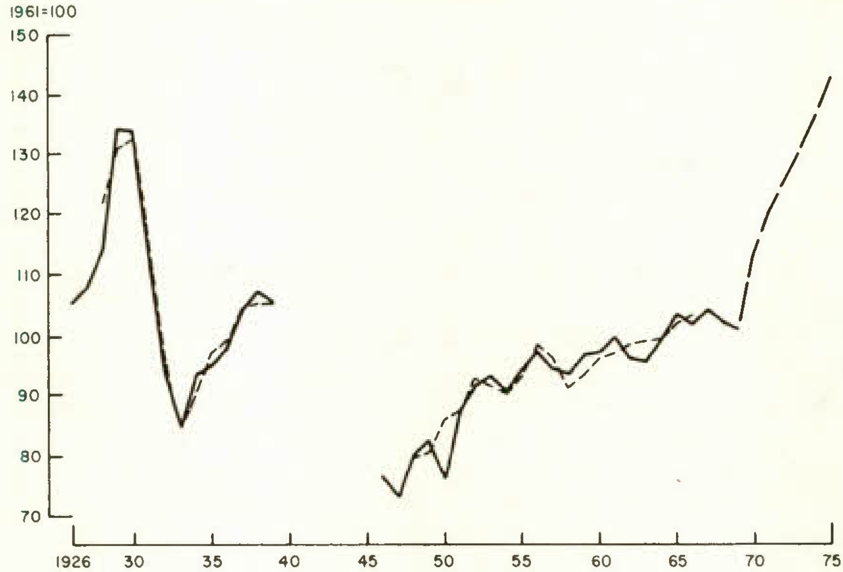
This group consists of soap and cleaning compounds, other household supplies and hardware.

We had great difficulty in finding an acceptable equation for this consumption group. In our trial regressions actual consumption in the 1926-29 period was substantially higher than calculated consumption. In the end we decided to omit the years 1926-29. As an extenuating circumstance it should be mentioned that the earliest Census of Retail Establishments is that of 1930 and Consumer Expenditure for "the 1926-30 period is extrapolated on the basis of the trend of retail sales of selected incorporated retail sales establishments as indicated in the corporate profits sample survey".[24]

The resulting equation indicates that consumption of this group is a distributed-lag function of x and p (see p. 12, special case 4). The elasticities with respect to p are remarkably high.

[24] Dominion Bureau of Statistics, *National Accounts, Income and Expenditure, 1926-56*, Ottawa, 1962, p. 156, para. 390.

1450 HOUSEHOLD OPERATION SERVICES (s.)



$$q_t = + 34.55154 + 0.27291 q_{t-1} + 0.02074 x_t - 0.39578 p_t - 5.61485 d_t$$
$$\quad (2.32810) \quad (0.05349) \quad (0.00149) \quad (0.02891) \quad (0.68739)$$
$$+ 0.35611 z_t$$
$$(0.12165)$$

$\alpha = + 27.1438$		$\bar{R}^2 = 0.965$
$\beta = + 0.8576$		$S.E.E. = 0.59$
$\gamma = + 0.0163$	$\gamma' = + 0.0285$	$D\text{-}W = 2.08$
$\delta = + 2$		
$\eta = - 0.3109$	$\eta' = - 0.5443$	

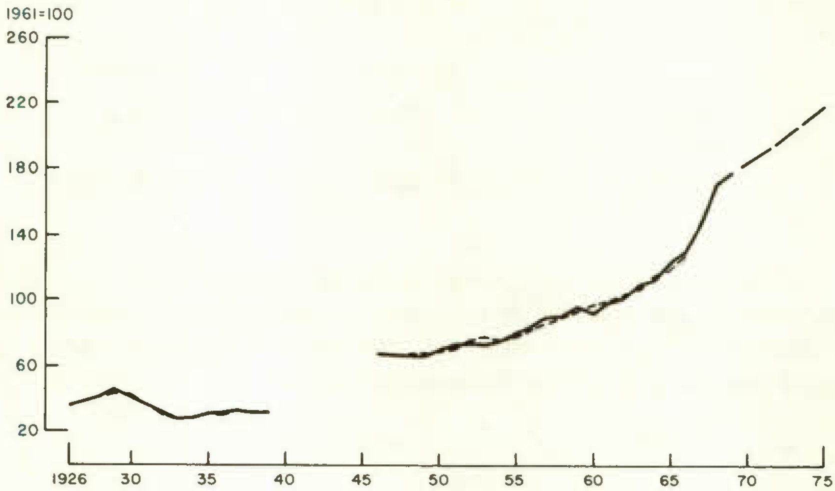
Consumption Elasticities

with respect to	short-term	long-term
x at mean	+ 0.72	+ 1.27
x in 1966	+ 1.07	+ 1.87
p at mean	− 1.10	− 1.92
p in 1966	− 1.34	− 2.35

	Real Consumption (1961 = 100)	
	per capita	aggregate
1969	101.2	116.8
1975	142.7	182.2
1975/1969	+ 41.1%	+ 56.0%

This group contains expenditures on domestic servants (in cash and in kind), babysitting, laundry and dry cleaning, coin-operated laundries, personal property insurance, theft insurance, furniture and appliance rental and janitor services. The expenditure on this group is a distributed-lag function of x and p. The elasticities with respect to x are on the high side, but even more so the ones with respect to p.

0510 MEDICAL AND PHARMACEUTICAL PRODUCTS (n.d.)



$$q_t = + 0.97682 q_{t-1} + 0.00064 x_{t-1} + 0.00798 \Delta x_t - 0.00298 p_{t-1}$$
$$(0.05600) \quad (0.00078) \quad (0.00220) \quad (0.00221)$$
$$- 0.03740 \Delta p_t - 0.2984 z_t$$
$$(0.01749) \quad (0.1729)$$

$\alpha = 0$

$\beta = + 0.0596$

$\gamma = + 0.0077$ $\quad \gamma' = + 0.0274$

$\delta = + 0.0831$

$\eta = - 0.0363$ $\quad \eta' = - 0.1287$

$\bar{R}^2 = 0.996$

$S.E.E. = 0.35$

$D\text{-}W = 1.90$

Consumption Elasticities

with respect to	short-term	long-term
x at mean	+ 0.72	+ 2.55
x in 1966	+ 0.60	+ 2.13
p at mean	− 0.37	− 1.33
p in 1966	− 0.15	− 0.53

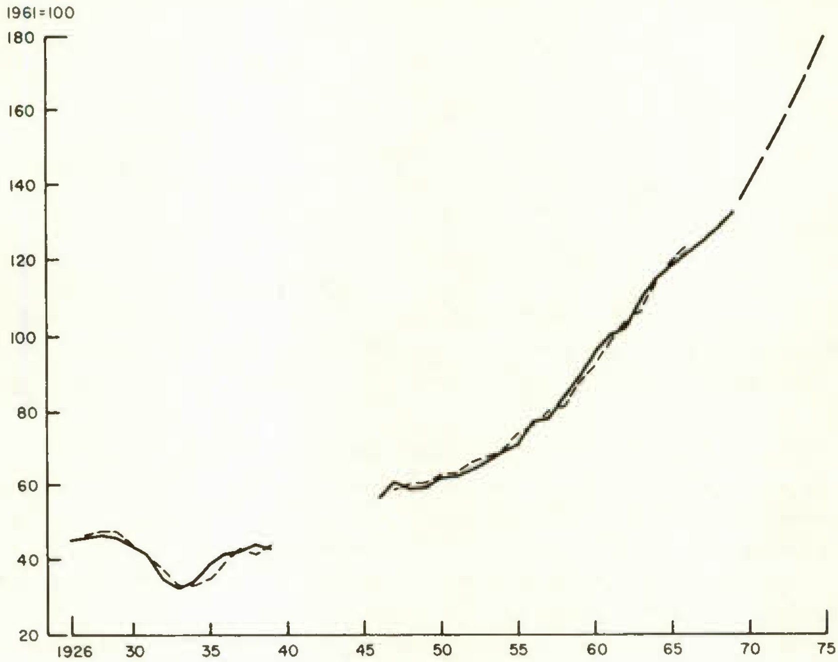
Personal Consumer Expenditures

	Real Consumption (1961 = 100)	
	per capita	aggregate
1969	178.8	206.5
1975	219.0	279.5
1975/1969	+ 22.5%	+ 35.4%

This equation has a remarkably high $\bar{R}^2$, the β has the expected sign, and the short-term elasticity with respect to x agrees reasonably well with the corresponding elasticity in the United States (+ 0.62). The U.S. long-term elasticity with respect to x is even higher than the Canadian.[25]

[25] Houthakker and Taylor, *op. cit.*, p. 95.

1500 MEDICAL CARE AND HEALTH SERVICES (s.)



$$q_t = -\ 3.53193 + 0.91258 q_{t-1} + 0.00823 x_{t-1} + 0.03566 \Delta x_t$$
$$(1.23567) \quad (0.06088) \quad (0.00366) \quad (0.00875)$$

$\alpha = -\ 14.1638$		$\bar{R}^2 = 0.994$
$\beta = +\ 0.1693$		$S.E.E. = 1.57$
$\gamma = +\ 0.0330$	$\gamma' = +\ 0.0941$	$D\text{-}W = 1.67$
$\delta = +\ 0.2608$		
$\eta =$	$\eta' =$	

Consumption Elasticities

with respect to	short-term	long-term
x at mean	+ 0.68	+ 1.95
x in 1966	+ 0.58	+ 1.65
p at mean		
p in 1966		

Personal Consumer Expenditures

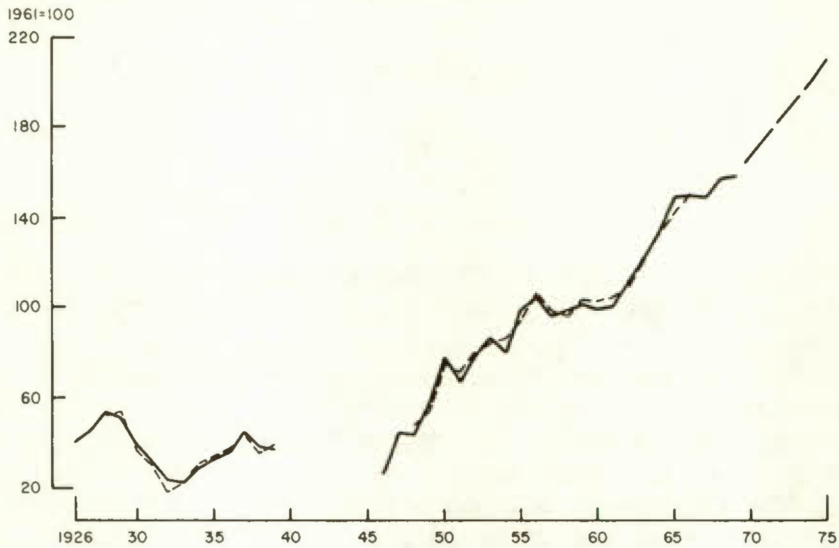
	Real Consumption (1961 = 100) per capita	aggregate
1969	132.3	152.8
1975	179.0	228.5
1975/1969	+ 35.2%	+ 49.5%

This group contains the services of physicians, dentists, private duty nurses, miscellaneous health services, hospital care and the like, prepaid medical care, accident and sickness insurance and certain adjusting entries in connection with payments by the Workmen's Compensation Board and by the Railways due to injuries to persons.

Starting with 1961 the Dominion Bureau of Statistics has transferred a part of Medical Care and Health Services Expenditures from Personal Consumer Expenditures to Government Expenditures. This transfer creates a discontinuity in our data. In this Study we have dealt with the problem caused by the discontinuity by restoring the transferred expenditures to Medical Care and Health Services (and also to Total Consumer Expenditures).

Our regression equation is noteworthy on several accounts. It indicates – at least for the period 1926-66 – that p had no significant effect on the consumption of this group. Furthermore, the long-term elasticity with respect to x is substantially higher than unity. This indicates that for a considerable future period the demand for health services will grow faster than total consumer expenditure.

0610 + 0622 + 0623 PERSONAL TRANSPORTATION DURABLES (d.)



$$q_t = -\ 14.55950 + 0.38593q_{t-1} + 0.05417x_{t-1} + 0.21600\Delta x_t$$
$$(5.27750) \quad (0.09600) \quad (0.00878) \quad (0.02100)$$
$$-\ 0.06577p_{t-1} - 0.26225\Delta p_t + 0.3715z_t$$
$$(0.05520) \quad (0.19775) \quad (0.2298)$$

$\alpha = -\ 73.2744$		$\bar{R}^2 = 0.991$
$\beta = -\ 0.5994$		$S.E.E. = 3.31$
$\gamma = +\ 0.2726$	$\gamma' = +\ 0.0882$	$D\text{-}W = 2.30$
$\delta = +\ 0.2867$		
$\eta = -\ 0.3310$	$\eta' = -\ 0.1071$	

Consumption Elasticities

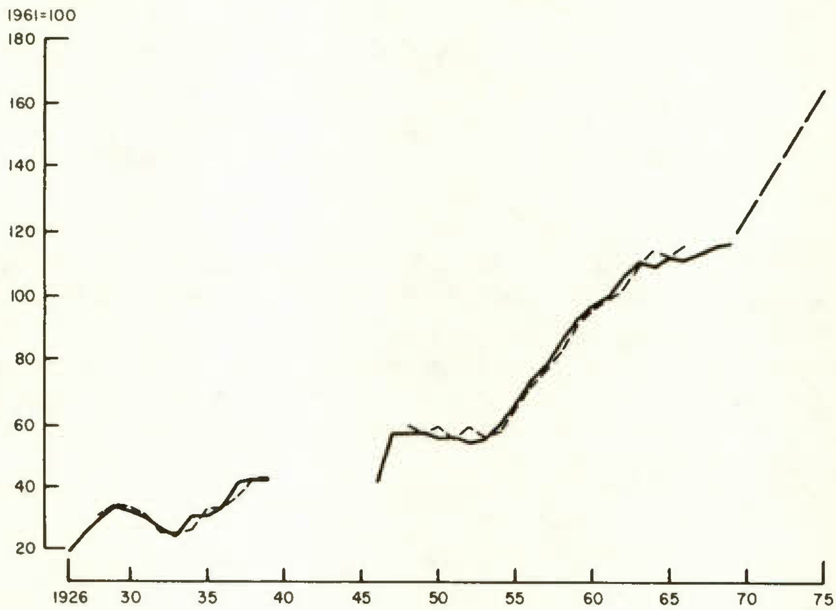
with respect to	short-term	long-term
x at mean	+ 4.32	+ 1.40
x in 1966	+ 3.27	+ 1.06
p at mean	− 0.45	− 0.15
p in 1966	− 0.21	− 0.07

	Real Consumption (1961 = 100)	
	per capita	aggregate
1969	158.4	182.9
1975	211.0	269.4
1975/1969	+ 33.2%	+ 47.3%

This group consists of new passenger cars, mark-up on used cars, trailers, motorcycles and bicycles, auto repairs and maintenance, and auto parts and accessories.

The equation for this group is attractive and interesting. The fit is good and the coefficients of the structural equation are reasonable – especially the beta. The substantial difference between the short- and the long-term elasticities is noteworthy. By 1966 the long-term elasticity with respect to x was barely larger than unity. The low long-term elasticity with respect to p is also remarkable – it indicates that in the long run relative price has hardly any influence on the consumption of transportation durables.

0621 GASOLINE, OIL AND GREASE (n.d.)



$$q_t = +\ 0.78066q_{t-1} + 0.00642x_{t-1} + 0.01747\Delta x_t - 0.01530p_{t-1}$$
$$(0.09350) \quad (0.00288) \quad (0.00472) \quad (0.00915)$$
$$-\ 0.04162\Delta p_t - 1.170d_t + 0.4111z_t$$
$$(0.01290) \quad (0.869) \quad (0.1903)$$

$\alpha = 0$		$\bar{R}^2 = 0.992$
$\beta = +\ 0.2041$		$S.E.E. = 0.92$
$\gamma = +\ 0.0160$	$\gamma' = +\ 0.0293$	$D\text{-}W = 1.78$
$\delta = +\ 0.4505$		
$\eta = -\ 0.0382$	$\eta' = -\ 0.0698$	

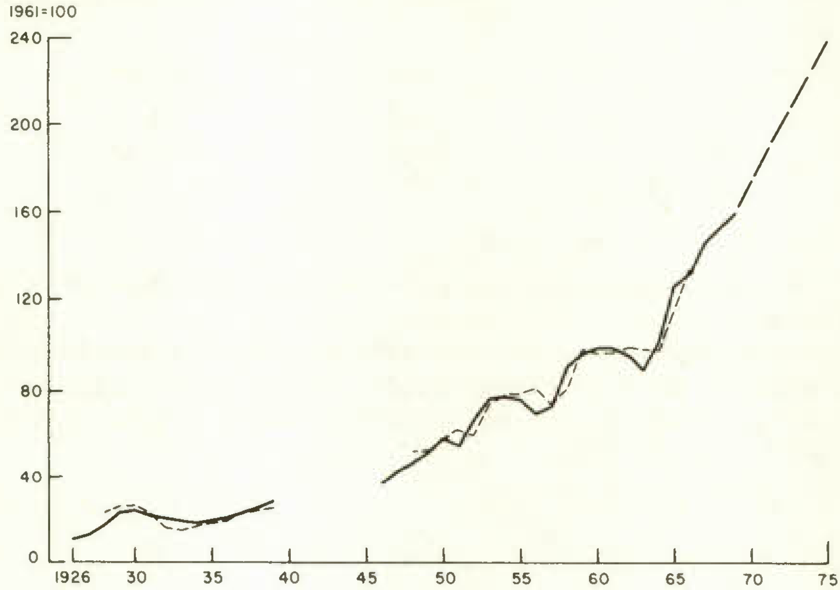
Consumption Elasticities

with respect to	short-term	long-term
x at mean	+ 0.83	+ 1.53
x in 1966	+ 0.70	+ 1.28
p at mean	− 0.22	− 0.40
p in 1966	− 0.10	− 0.18

	Real Consumption (1961 = 100)	
	per capita	aggregate
1969	116.6	134.7
1975	164.5	210.0
1975/1969	+ 41.1%	+ 55.9%

This is an attractive equation. The positive β indicates the presence of habit-formation in the consumption of this group. It is interesting to note that the long-term elasticity with respect to x is notably larger than unity even in 1966. This may reflect the increased use of automobiles for holiday travel as x increases. On the other hand, the long-term elasticity with respect to p was small; the relative price of this group seems to have little long-term effect on the consumption of gasoline, oil and grease.

1620 OPERATION OF PERSONAL TRANSPORTATION EQUIPMENT (s.)



$$q_t = -\ 3.10003 + 0.55784 q_{t-1} + 0.00606 x_t + 0.34895 z_t$$
$$(0.71811) \quad (0.12363) \quad (0.00133) \quad (0.13247)$$

$\alpha = -\ 1.9900$		$\bar{R}^2 = 0.979$
$\beta = +\ 1.4323$		$S.E.E. = 0.47$
$\gamma = +\ 0.0039$	$\gamma' = +\ 0.0137$	$D\text{-}W = 1.80$
$\delta = +\ 2$		
$\eta =$	$\eta' =$	

Consumption Elasticities

with respect to	short-term	long-term
x at mean	+ 0.78	+ 2.73
x in 1966	+ 0.54	+ 1.89
p at mean		
p in 1966		

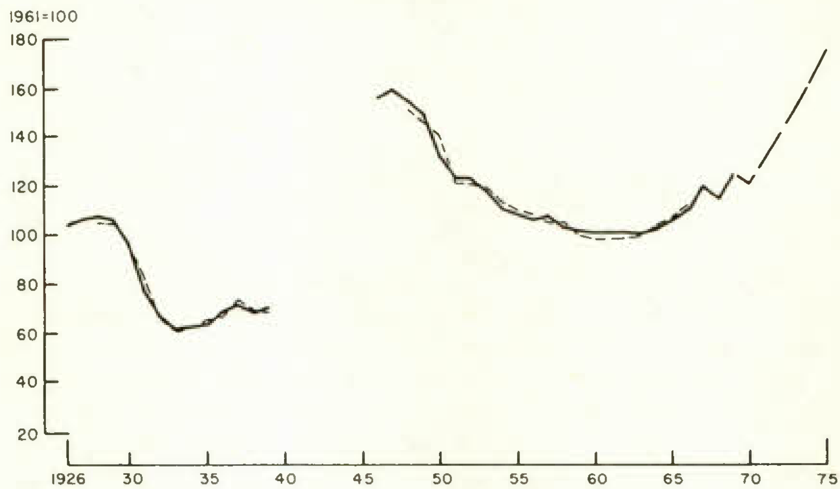
Real Consumption
(1961 = 100)

	per capita	aggregate
1969	160.5	185.2
1975	239.2	305.3
1975/1969	+ 49.0%	+ 64.8%

This group consists of bridge, tunnel and ferry tolls, auto insurance and garage rental.

The p variables had positive signs and were discarded. The historical data (and the projection) show a very strong growth trend. This is due to the rapid increase in automobile insurance expenditures, which by 1966 accounted for more than half of this group.

1630 PURCHASED TRANSPORTATION (s.)



$$q_t = +\ 9.10259 + 0.49134q_{t-1} + 0.03352x_t - 0.09122p_t - 2.05475d_t$$
$$(5.83274) \quad (0.07399) \quad (0.00600) \quad (0.04847) \quad (1.51796)$$
$$-\ 0.14117\ (\text{passenger automobile registrations/1,000 population})_t + 0.39976z_t$$
$$(0.02902) \qquad\qquad\qquad (0.19747)$$

$\alpha = +\ 6.1036$		$\bar{R}^2 = 0.983$
$\beta = +\ 1.3179$		$S.E.E. = 0.79$
$\gamma = +\ 0.0225$	$\gamma' = +\ 0.0659$	$D\text{-}W = 2.07$
$\delta = +\ 2$		
$\eta = -\ 0.0612$	$\eta' = -\ 0.1793$	

Consumption Elasticities

with respect to	short-term	long-term
x at mean	+ 0.98	+ 2.88
x in 1966	+ 1.35	+ 3.96
p at mean	− 0.25	− 0.72
p in 1966	− 0.23	− 0.67

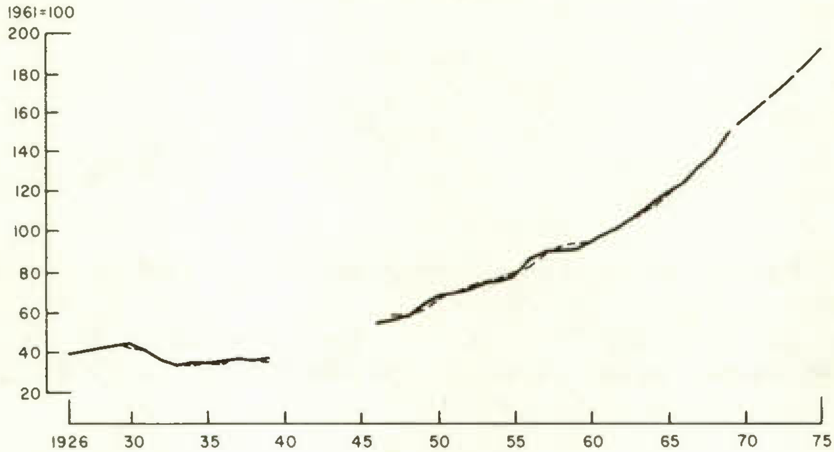
	Real Consumption (1961 = 100) per capita	aggregate
1969	111.4	128.6
1975	174.4	222.7
1975/1969	+ 56.6%	+ 73.1%

This group consists of consumer expenditures on railway, streetcar and bus transportation, airplane and steamship fares, taxicabs, moving and storage expenses and express charges.

Expenditure on this group was very high in the immediate postwar years, but declined, first steeply, then more gradually, until the early 1960's. This pattern may be due to the shortage of automobiles in the late 1940's, which disappeared during the postwar decade. We decided to introduce passenger automobile registrations per 1,000 population as an additional variable into our equation and it turned out to have the correct sign and a highly significant coefficient.

The projected huge increase in expenditure may seem anomalous, but the following consideration may make it plausible: the dynamic, growth-producing component of this group since the early 1960's has been air travel, which by 1966 accounted for about 30 per cent of this group while railroad fares accounted for less than 10 per cent. It is reasonable to assume that long-distance travel, and particularly air travel, is highly elastic with respect to x.

1640 COMMUNICATIONS (s.)



$$q_t = +\ 0.93801q_{t-1} + 0.00169x_{t-1} + 0.00740\Delta x_t - 0.00612p_{t-1}$$
$$(0.06200) \quad (0.00101) \quad (0.00146) \quad (0.00219)$$
$$-\ 0.02685\Delta p_t$$
$$(0.00698)$$

$\alpha = \ 0$		$\bar{R}^2 = 0.998$
$\beta = +\ 0.1933$		$S.E.E. = 0.28$
$\gamma = +\ 0.0068$	$\gamma' = +\ 0.0272$	$D\text{-}W = 1.77$
$\delta = +\ 0.2572$		
$\eta = -\ 0.0245$	$\eta' = -\ 0.0987$	

Consumption Elasticities

with respect to	short-term	long-term
x at mean	+ 0.52	+ 2.08
x in 1966	+ 0.44	+ 1.78
p at mean	− 0.19	− 0.77
p in 1966	− 0.09	− 0.36

	Real Consumption (1961 = 100)	
	per capita	aggregate
1969	150.9	174.3
1975	192.3	245.6
1975/1969	+ 27.4%	+ 40.9%

This group consists of expenditures on telephone, cables and telegraphs, and postage.

The equation for this group is very plausible. It displays the expected habit-formation (positive β), relatively low short-term elasticities and a very substantial long-term elasticity with respect to x.

6. DISCUSSION OF RESULTS

In Chapter 5 we have analysed 14 consumer expenditure groups – four durables, two semidurables, three nondurables and five services. As pointed out in Chapter 2, we should in general expect durables and semidurables to show negative betas; and nondurables and services, positive betas. The consumption equations in this second part of our Study yield the results summarized in Table 3.

TABLE 3

SIGN OF BETA BY CONSUMER ITEM

Item	Positive	Negative
Durables		
0411+0413 Furniture, Upholstery & Furniture Repair		x
0412 Carpets & Other Floor Coverings	x	
0430 Household Appliances		x
0610+0622+0623 Personal Transportation Equipment, Auto Repairs & Maintenance, Auto Parts & Accessories		x
Semidurables		
0420 Household Textiles & Other Furnishings		x
0440 Glassware, Tableware & Household Utensils		x
Nondurables		
0450 Household Operation Goods	x	
0510 Medical & Pharmaceutical Products	x	
0621 Gasoline, Oil & Grease	x	
Services		
1450 Household Operation Services	x	
1500 Medical Care & Health Services	x	
1620 Operation of Personal Transportation Equipment	x	
1630 Purchased Transportation	x	
1640 Communications	x	

Thirteen out of 14 items have betas with the expected sign; Carpets and Other Floor Coverings (0412) is the sole exception.

$\underline{x}$ proved to be the most important variable, just as it did in Part 1 of this Study.[26] It was accepted in all 14 equations and its significance is usually high.

p appears in nine equations, always with a negative sign. In four instances (0411 + 0413 Furniture, Upholstery and Furniture Repair, 0412 Carpets and Other Floor Coverings, 0430 Household Appliances, 1500 Medical Care and Health Services) the *p* terms were not significant. In one instance (1620 Operation of Personal Transportation Equipment) *p* was rejected because of the wrong sign of the coefficient.

Auxiliary variables – other than the prewar-postwar dummy – appear in three equations: non-apartment dwelling completions in 0430 Household Appliances, marriages in 0440 Glassware, Tableware and Household Utensils, and passenger automobile registrations in 1630 Purchased Transportation.

The results of the goodness of fit are summarized in Table 4.

The forecasting ability of our equations over the period 1966-69 will be discussed in Chapter 7.

TABLE 4

$\bar{R}^2$ OF THE EQUATIONS

$\bar{R}^2$	Frequency
0.95 – 0.96	2
0.96 – 0.97	1
0.97 – 0.98	3
0.98 – 0.99	3
0.99 +	5

[26] *Op. cit.*, p. 70.

7. FORECASTING THE 1966-69 PERIOD

Our regressions are calculated on data for the 1926-66 period.

To test the forecasting ability of the Houthakker-Taylor model, we have attempted to forecast consumption of the items discussed in Part 2 of this Study for the 1966-69 period. We have also computed forecasts by means of two naive methods:

Naive I: The per capita real consumption of each item will grow in the three-year period 1966-69 by the same percentage as the corresponding percentage increase in the preceding period of equal length, i.e. 1963-66.

Naive II: The per capita real consumption of each item will grow in the three-year period 1966-69 at the same rate as per capita real total consumer expenditure.

In part 1 of this Study[27] we performed similar tests on the 24 consumer items discussed therein. The tests were applied to the 1966-68 period. Since the publication of Part 1 (December 1969), an additional year's data have become available. In Table 5 we are updating the tests of Part 1 as well as reporting the results of the items contained in this Part .

A convenient summary measure of the quality of forecasts in Theil's U.[28] This measure is defined as

$$U = \sqrt{\frac{\Sigma (P_i - A_i)^2}{\Sigma A_i^2}}$$

where P_i is the predicted change of item i, and A_i the observed change. It is obvious that U equals zero in the case of a perfect forecast, equals unity in the case of a forecast that is no better than a "no change" prediction, and is bigger than unity if the forecast is worse than a "no change" prediction.

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[27] Schweitzer, *op. cit.*, pp. 71-72.

[28] For a detailed description see H. Theil, *Applied Economic Forecasting*, North-Holland Publishing Co., Amsterdam, 1966, pp. 26-43.

TABLE 5

ACTUAL AND FORECASTED PERCENTAGE CHANGES, 1966-69

Item	Actual	H-T*	Naive I	Naive II
0111 Food Purchased at Retail	+ 6.8	+10.8	+ 2.5	+10.3
0112 Food Produced & Consumed on Farms	− 0.2	−24.6	−12.8	+10.3
0113 Other Food	+ 9.3	− 9.8	+ 9.8	+10.3
0121 Nonalcoholic Beverages	+10.3	+ 7.6	+ 9.0	+10.3
0122 Alcoholic Beverages	+ 6.4	+11.4	+11.8	+10.3
0130 Tobacco	− 9.8	+ 0.9	+ 1.8	+10.3
0211 Men's & Boys' Clothing	+ 2.6	+ 3.8	+ 7.4	+10.3
0212 Women's & Children's Clothing	+ 5.8	+ 9.9	+ 5.1	+10.3
0213+0214 Notions & Piece Goods	+15.9	+10.9	− 5.0	+10.3
0215 Armed Forces Clothing	−15.0	− 7.5	−21.6	+10.3
1210 Dressmaking & Tailoring	+29.2	+ 1.5	− 5.1	+10.3
0221 Footwear	− 2.3	+ 6.3	− 2.2	+10.3
0222 Shoe Repair	+25.0	+ 2.4	− 0.8	+10.3
0231 Luggage & Leather Goods	+12.2	+ 5.4	+ 2.8	+10.3
0232 Jewellery	+ 9.6	+14.6	+15.5	+10.3
0233 Jewellery Repair	−10.9	−27.3	− 1.8	+10.3
0310 Water Charges	− 8.0	+28.5	+14.3	+10.3
0321 Electricity	+27.3	+19.5	+14.0	+10.3
0322+0323 Gas & Other Fuels	+ 4.3	+ 8.0	+ 5.8	+10.3
1311 Gross Rents, Imputed	+12.2	+14.0	+12.5	+10.3
1312 Gross Rents, Paid	+18.5	+12.9	+16.8	+10.3
1313 Imputed Lodging N.E.S.	+13.3	+ 1.8	+27.2	+10.3
1315 Board & Lodging in Universities	+44.3	+51.6	+56.4	+10.3
1316 House Maintenance Repairs	−18.6	−19.8	+ 1.7	+10.3
0411+0413 Furniture, Upholstery & Furniture Repair	− 4.7	+11.8	+ 5.7	+10.3
0412 Carpets & Other Floor Coverings	+15.0	+27.4	+42.8	+10.3
0420 Household Textiles & Other Furnishings	+12.7	+ 9.9	+22.8	+10.3
0430 Household Appliances	− 0.3	+14.8	+24.4	+10.3
0440 Glassware, Tableware & Household Utensils	+12.5	+14.5	+25.5	+10.3
0450 Household Operation Goods	+ 1.3	+16.0	+ 6.4	+10.3
1450 Household Operation Services	− 0.8	+10.8	+ 6.4	+10.3
0510 Medical & Pharmaceutical Products	+36.8	+13.5	+19.0	+10.3
1510 Medical Care & Health Services	+ 8.9	+13.3	+11.1	+10.3
0610 +0622+0623 Personal Transportation Equipment, Auto Repairs & Maintenance, Auto Parts & Accessories	+ 5.5	+ 6.8	+23.8	+10.3
0621 Gasoline, Oil & Grease	+ 4.3	+12.3	+ 1.1	+10.3
1620 Operation of Personal Transportation Equipment	+21.1	+23.2	+47.4	+10.3
1630 Purchased Transportation	+ 1.7	+ 5.9	+ 9.1	+10.3
1640 Communications	+20.6	+13.7	+15.3	+10.3

*Houthakker and Taylor.

After weighting our forecasts by the relative importance of the consumer items investigated (1966 weights), we have calculated the following U values.

Houthakker-Taylor	$U = 0.67$
Naive I	$U = 0.88$
Naive II	$U = 0.73$

As pointed out in Chapter 4, the DBS data are more reliable for big items than for small ones. We have recalculated the U statistics for the "important" items – defining as "important" those which amounted to at least 0.5 per cent of Total Consumer Expenditure in 1966. The list of these "important" items consists of all items discussed in Chapter 5 of Part 2 plus items 0111, 0121, 0122, 0130, 0211, 0212, 0221, 0321, 0322 + 0323, 1311 and 1312. Using only the "important" items, we obtained

Houthakker-Taylor	$U = 0.60$
Naive I	$U = 0.86$
Naive II	$U = 0.72$

The analysis of the consumer items discussed in Part 2 and the extension of the forecast-period for the items analysed in Part 1 confirms the conclusions drawn therein.[29]

1. The Houthakker-Taylor method has acquitted itself reasonably well.
2. The quality of forecasts depends crucially on the quality of historical data. We believe that considerable scope exists for improvement in the quality of the disaggregated DBS estimates of consumer expenditures. The interest of the users of these data would be well served by the allocation of adequate resources to effect such improvements when future revision of these data is undertaken.

[29] Schweitzer, *op. cit.*, p. 72.

8. DISCUSSION OF PROJECTIONS

The total projected growth of the consumer items discussed in Part 2 of this Study for the 1969-75 period is contained in Table 6.

TABLE 6

PROJECTED PERCENTAGE GROWTH, 1969–75

No.	Item	Percentage Change 1969–75
0412	Carpets & Other Floor Coverings	+90.4
0430	Household Appliances	+74.9
1630	Purchased Transportation	+73.1
1620	Operation of Personal Transportation Equipment	+64.8
0411+0413	Furniture, Upholstery & Furniture Repair	+63.9
1450	Household Operation Services	+56.0
0621	Gasoline, Oil & Grease	+55.9
0440	Glassware, Tableware & Household Utensils	+54.4
1500	Medical Care & Health Services	+49.5
0610+0622+0623	Personal Transportation Equipment, Auto Repairs & Maintenance, Auto Parts & Accessories	+47.3
0450	Household Operation Goods	+41.6
1640	Communications	+40.9
	Total Consumer Expenditure	+39.8
0420	Household Textiles & Other Furnishings	+38.2
0510	Medical & Pharmaceutical Products	+35.4

It is noteworthy that with the exception of Household Textiles & Other Furnishings, and Medical & Pharmaceutical Products, all items discussed in Chapter 5 of Part 2 will grow faster than Total Consumer Expenditure, if the assumptions of *Perspective 1975* are realized.

Personal Consumer Expenditures

The projection of the three major sections can be summarized as follows:

	Millions of 1961 Dollars 1969	1975	1969–75 Percentage Change
Section IV Furniture, Furnishings, Household Equipment & Household Operation	2,770.4	4,446.1	+ 60.5
Section V Medical Care and Health Expenses	2,813.3	4,116.1	+ 46.3
Section VI Transportation & Communications	5,479.2	8,305.1	+ 51.6

Expressed as percentage of (adjusted) Total Consumer Expenditure, we obtain:

	1969	1975	Change in Percentage
Section IV Furniture, Furnishings, Household Equipment & Household Operation	7.1	8.1	+ 1.0
Section V Medical Care and Health Expenses	7.2	7.5	+ 0.3
Section VI Transportation & Communications	14.0	15.1	+ 1.1

It must be emphasized that the DBS data are subject to future revisions. These revisions will necessarily influence the projected growth rate of the items and to a lesser extent also the projected 1975 levels. Part 2 of this Study reflects the status of the data as of May 1970.

PUBLICATIONS OF ECONOMIC COUNCIL OF CANADA

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PUBLICATIONS DU CONSEIL ÉCONOMIQUE DU CANADA

Annual Reviews	Author—Auteur	Exposés annuels
First Annual Review: Economic Goals for Canada to 1970 (EC21-1/1964, $3.50)	Council – Conseil	Premier exposé annuel: Objectifs économiques du Canada pour 1970 (EC21-1/1964F, $3.50)
Second Annual Review: Towards Sustained and Balanced Economic Growth (EC21-1/1965, $2.75)	Council – Conseil	Deuxième exposé annuel: Vers une croissance économique équilibrée et soutenue (EC21-1/1965F, $2.75)
Third Annual Review: Prices, Productivity and Employment (EC21-1/1966, $2.75)	Council – Conseil	Troisième exposé annuel: Les prix, la productivité et l'emploi (EC21-1/1966F, $2.75)
Fourth Annual Review: The Canadian Economy from the 1960's to the 1970's (EC21-1/1967, $2.75)	Council – Conseil	Quatrième exposé annuel: L'économie canadienne des années 1960 aux années 1970 (EC21-1/1967F, $2.75)
Fifth Annual Review: The Challenge of Growth and Change (EC21-1/1968, $2.75)	Council – Conseil	Cinquième exposé annuel: Défi posé par la croissance et le changement (EC21-1/1968F, $2.75)
Sixth Annual Review: Perspective 1975 (EC21-1/1969, $2.75)	Council – Conseil	Sixième exposé annuel: Perspectives 1975 (EC21-1/1969F, $2.75)
Seventh Annual Review: Patterns of Growth (EC21-1/1970, $2.50)	Council – Conseil	Septième exposé annuel: Les diverses formes de la croissance (EC21-1/1970F, $2.50)
Performance and Potential: Mid-1950's to Mid-1970's (EC21-1/1970-1, $1.50)	Council – Conseil	La tenue et le potentiel de l'économie: du milieu des années 1950 au milieu des années 1970 (EC21-1/1970-1F, $1.50)

Staff Studies	Author—Auteur	Études préparées par le personnel
1. Population and Labour Force Projections to 1970 (EC22-1/1, $.75)	Frank T. Denton, Yoshiko Kasahara, Sylvia Ostry	1. Projections de la population et de la main-d'œuvre jusqu'à 1970 (EC22-1/1F, $.75)
2. Potential Output, 1946 to 1970 (EC22-1/2, $1.00)	B. J. Drabble	2. Potentiel de production, 1946 à 1970 (EC22-1/2F, $1.00)
3. An Analysis of Post-War Unemployment (EC22-1/3, $.75)	Frank T. Denton, Sylvia Ostry	3. Une analyse du chômage depuis la fin de la guerre (EC22-1/3F, $.75)
4. Housing Demand to 1970 (EC22-1/4, $.75)	Wolfgang M. Illing	4. Demande d'habitations pour 1970 (EC22-1/4F, $.75)
5. Business Investment to 1970 (EC22-1/5, $1.00)	Derek A. White	5. Investissements privés pour 1970 (EC22-1/5F, $1.00)
6. Special Survey of Longer Range Investment Outlook and Planning in Business (EC22-1/6, $.25)	B. A. Keys	6. Enquête spéciale sur les intentions et la programmation à moyen terme des entreprises privées (EC22-1/6F, $.25)
7. Canada and World Trade (EC22-1/7, $.50)	M. G. Clark	7. Le Canada et le commerce mondial (EC22-1/7F, $.50)
8. Export Projections to 1970 (EC22-1/8, $.75)	J. R. Downs	8. Projections des exportations jusqu'à 1970 (EC22-1/8F, $.75)
9. Federal Tax Revenues at Potential Output, 1960 and 1970 (EC22-1/9, $.50)	D. J. Daly	9. Rendement des impôts fédéraux dans l'hypothèse de la réalisation du potentiel de production, 1960 et 1970 (EC22-1/9F, $.50)
10. National Saving at Potential Output to 1970 (EC22-1/10, $.50)	Frank W. Wildgen	10. L'épargne nationale dans l'hypothèse de la réalisation du potentiel de production pour 1970 (EC22-1/10F, $.50)
11. Changes in Agriculture to 1970 (EC22-1/11, $.50)	John Dawson	11. Changements dans le secteur agricole jusqu'à 1970 (EC22-1/11F, $.50)
12. The Contribution of Education to Economic Growth (EC22-1/12, $1.50)	Gordon W. Bertram	12. Apport de l'éducation à la croissance économique (EC22-1/12F, $1.50)
13. Internal Migration in Canada, 1921-1961 (EC22-1/13, $1.60)	Isabel B. Anderson	13. Migration à l'intérieur du Canada, 1921-1961 (EC22-1/13F, $1.60)
14. Interregional Disparities in Income (EC22-1/14, $1.75)	S. E. Chernick	14. Disparités interrégionales du revenu (EC22-1/14F, $1.75)
15. An Analysis of Interregional Differences in Manpower Utilization and Earnings (EC22-1/15, $1.00)	Frank T. Denton	15. Analyse des différences interrégionales dans l'utilisation de la main-d'œuvre et le revenu gagné (EC22-1/15F, $1.00)

Staff Studies (*continued*)	Author—Auteur	Études préparées par le personnel (*suite*)
17. Business Cycles in Canada (EC22-1/17, $2.25)	Derek A. White	17. Les cycles économiques au Canada (EC22-1/17F, $2.25)
18. Manpower Planning in Industry: A Case Study (EC22-1/18, $1.00)	B. A. Keys H. H. Wright	18. La planification de la main-d'œuvre dans l'industrie (Étude de cas) (EC22-1/18F, $1.00)
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22. Medium-Term Business Investment Outlook: 1967 Survey (EC22-1/22, $.35)	B. A. Keys	22. Perspectives à moyen terme des investissements des entreprises: Relevé de 1967 (EC22-1/22F, $.35)
23. Canadian Income Levels and Growth: An International Perspective (EC22-1/23, $2.25)	Dorothy Walters	
24. Canadian Agricultural Productivity (EC22-1/24, $1.50)	L. Auer	
25. Enrolment in Educational Institutions, by Province, 1951-52 to 1980-81 (EC22-1/25, $3.00)	Z. E. Zsigmond C. J. Wenaas	25. Inscriptions dans les institutions d'enseignement, par province, de 1951-1952 à 1980-1981 (EC-22-1/25F, $3.00)
26. Personal Consumer Expenditures in Canada, 1926-75: Part 1 (EC22-1/26-1, $1.50)	Thomas T. Schweitzer	26. Dépenses personnelles de consommation au Canada, 1926-1975: Partie 1 (EC22-1/26-1F, $1.50)
Personal Consumer Expenditures in Canada, 1926-75: Part 2 (EC22-1/26-2, $1.50)	Thomas T. Schweitzer	Dépenses personnelles de consommation au Canada, 1926-1975: Partie 2 (EC22-1/26-2F, $1.50)
*Personal Consumer Expenditures in Canada, 1926-75: Part 3 (EC22-1/26-3, $0.00)	Thomas T. Schweitzer	†Dépenses personnelles de consommation au Canada, 1926-1975: Partie 3 (EC22-1/26-3F, $0.00)
*27. Some Economic Aspects of Provincial Educational Systems (EC22-1/27, $0.00)	J. Cousin J.-P. Fortin C. J. Wenaas	†27. Certains aspects économiques des systèmes provinciaux d'enseignement (EC22-1/27F, $0.00)
28. Canadian Growth Revisited, 1950-1967 (EC22-1/28, $1.50)	Dorothy Walters	

Staff Studies (*concluded*)	Author—Auteur	Études préparées par le personnel (*fin*)
*29. Sources of Growth in Canadian Industries, 1946-68 (EC22-1/29, $0.00)	Wolfgang M. Illing	†29. Sources de croissance dans les industries canadiennes, 1946-1968 (EC22-1/29F, $0.00)
*30. Productivity Change in Canadian Mining Industries (EC22-1/30, $0.00)	John Dawson	†30. L'évolution de la productivité dans les industries extractives canadiennes (EC22-1/30F, $0.00)
*31. An Analysis of Canadian Manufacturing Productivity: Some Preliminary Results (EC22-1/31, $0.00)	Harry H. Postner	†31. Analyse de la productivité dans les industries manufacturières canadiennes—Premiers résultats (EC22-1/31F, $0.00)
*32. Canada-United States Price and Productivity Differences in Manufacturing Industries, 1963 (EC22-1/32, $0.00)	E. C. West	†32. Différences de prix et de productivité dans les industries manufacturières, Canada et États-Unis, 1963 (EC22-1/32F, $0.00)
*33. Development of Community Colleges in Canada (EC22-1/33, $0.00)	Max von Zur-Muehlen	†33. Développement des collèges communautaires au Canada (EC22-1/33F, $0.00)

Special Studies	Author—Auteur	Études spéciales
1. Immigration and Emigration of Professional and Skilled Manpower During the Post-War Period (EC22-2/1, $1.50)	L. Parai	1. Immigration et émigration de spécialistes et de travailleurs qualifiés depuis la fin de la guerre (EC22-2/1F, $1.50)
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4. Incomes Policies—Some Foreign Experiences and Their Relevance for Canada (EC22-2/4, $1.75)	David C. Smith	4. Politiques des revenus—certaines expériences à l'étranger et les conclusions à en tirer pour le Canada (EC22-2/4F, $1.75)
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Conference Papers and Reports	Author—Auteur	Documents et rapports de colloques
National Conference on Labour-Management Relations (1964) (EC22-364, $2.00)		Colloque national sur les relations patronales-ouvrières (1964) (EC22-364F, $2.00)
National Conference on Labour-Management Relations (1967) (EC22-367, $2.00)		Colloque national sur les relations patronales-ouvrières (1967) (EC22-367F, $2.00)
Conference on Stabilization Policies, Report of the Conference at University of Western Ontario, August 1965 (EC22-665, $3.00)		Colloque sur les politiques de stabilisation, Rapport du colloque tenu à l'Université Western Ontario, août 1965 (EC22-665F, $3.00)
Conference on International Trade and Canadian Agriculture, Banff, Alberta, January 1966 (EC22-766, $3.00)		Colloque sur le commerce international et l'agriculture canadienne, Rapport du colloque tenu à Banff (Alberta), janvier 1966 (EC22-766F, $3.00)
Conference on Government Information Systems, Ottawa, October 5 and 6, 1967 (EC22-1168, $1.50)		
Papers presented at Conferences on Productivity through New Technology		**Documents présentés aux Colloques sur la productivité par la nouvelle technologie**
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Other Studies and Reports	Author—Auteur	Autres études et rapports
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Annual Report (1968) (EC1-1968)	Arthur J. R. Smith	Rapport annuel (1968) (EC1-1968F)
Annual Report (1969) (EC1-1969)	Arthur J. R. Smith	Rapport annuel (1969) (EC1-1969F)
Annual Report (1970) (EC1-1970)	Arthur J. R. Smith	Rapport annuel (1970) (EC1-1970F)
A General Incentive Programme to Encourage Research and Development in Canadian Industry, A Report to the Economic Council of Canada (EC22-565, $.60)	Advisory Committee on Industrial Research and Technology – Comité consultatif sur la recherche industrielle et la technologie	Programme général de stimulation des travaux de recherche et de développement dans l'industrie canadienne, Rapport présenté au Conseil économique du Canada (EC22-565F, $.60)
A Declaration on Manpower Adjustments to Technological and Other Change (EC22-866, $.75)	Council – Conseil	Une déclaration au sujet de l'adaptation de la main-d'œuvre aux changements technologiques et autres (EC22-866F, $.75)
Towards Better Communications Between Labour and Management (EC22-967, $.25)	Council – Conseil	Vers une amélioration de la communication entre patrons et travailleurs (EC22-967F, $.25)

Other Studies and Reports *(concluded)*	Author—Auteur	Autres études et rapports *(fin)*
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Personal Consumer Expenditures in Canada, 1926-75
Part 2

by Thomas T. Schweitzer

Economic Council of Canada