CANADIAN TECHNOLOGY AND DERIVED IMPORT DEMAND AND EXPORT SUPPLY FUNCTIONS

by

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ABSTRACT

In this thesis we model the structure of Canadian foreign trade and investigate the relationship among imports, exports, and other inputs or outputs. Rather than estimate isolated import and export demand functions, we assume that import and export decisions are made by profit maximizing firms which choose the quantities of their variable inputs and outputs subject to a vector of prices and a vector of fixed inputs. Imports and exports are thus integrated into a model of the Canadian technology together with other domestic inputs and outputs (capital, labour, and indirect taxation on the input side; consumption, investment, changes in inventories, and government purchases on the output side). The model also allows for factor augmenting technological change in a multi-input multi-output framework. Applying duality theory we specify a variable profit function (translog) which is a second order approximation to this technology. The derived import demand and export supply functions are then estimated simultaneously with the equations of the remaining variables. This treatment of imports and exports within a consistent theoretical framework yields not only estimates of the price elasticities of imports and exports, but also determines the possibilities of substitution among imports, exports, and domestic inputs or outputs. Thus we found that exports and investment goods are complements in production and that both are import intensive. We also found that imports are capital intensive and exports labour intensive. Regarding the own price elasticities of both imports and exports, it appeared that they are somewhat higher than it was usually thought.

A major part of the thesis is devoted to the construction of imports and exports data. Both are disaggregated into four components and price and quantity indices are calculated for 1948 to 1972. These indices also account for import duties and re-exports.

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1. INTRODUCTION

International trade is one of the branches of economics for which statistical information is the most extensive. Not surprisingly therefore, there have been a considerable number of quantitative studies in this field, a large number of them aiming to estimate import and export functions. The standard procedure is to estimate imports (or exports) as a linear or loglinear function of some income variable and some relative price variable by ordinary least squares. It will be argued in this thesis that this procedure is subject to a wide range of criticisms, largely because of its lack of theoretical foundations or because of the implicit assumptions, the meaning of which are seldom thoroughly investigated.

In this thesis import and export functions will be derived within a more general theoretical framework. In particular, we will estimate simultaneously import or export functions and the underlying technology without imposing any a priori restriction on the sign or the size of the elasticities of substitution between traded goods and domestic goods.

Burgess (1974a,b) has recently made use of duality theory in estimating a cost function for the United States where imports are competing with labour and capital. This formulation recognizes the fact that most internationally traded goods are intermediate products and that even finished products usually pass through commercial channels before reaching final demand.

In this thesis, a framework similar to that of Burgess is used to estimate the structure of Canadian foreign trade. We depart however from Burgess by adding exports to the model. Furthermore, indirect taxes on intermediate transactions are integrated into the model. This is necessary in order for the accounting identity between the costs and the revenues of the private economy to be satisfied. Factor augmenting technological change in a multi-input multi-output framework is modelled and we test for the presence of Hicks neutral technological change. A variable profit function is used and we regard quantities of traded goods as endogenous and their prices as exogenous rather than the reverse. Although this affects the stochastic specification only, we believe that our formulation is intuitively more attractive since it is very similar to the traditional model of the pure theory of international trade. Finally, imports and exports are disaggregated and two separate submodels, an import cost function and export revenue function, are estimated.

This thesis is therefore an application of duality theory to international trade. At the same time it describes the construction and the estimation of a flexible neoclassical impact model of a country's private business sector, with emphasis on the structure of its foreign trade. This framework is well suited to analysing the effect of a number of government policies such as changes in tariffs or taxes on outputs, intermediate inputs, and primary input rewards. Finally an important part of the thesis is devoted to the construction of price and quantity components of postwar Canadian foreign trade. Trade data are put on a consistent classification basis and pre and post tariff prices are constructed. These series provide a useful data base for future research in international trade and the testing of neoclassical production theory.

2. ESTIMATION OF IMPORT AND EXPORT FUNCTIONS: THE TRADITIONAL APPROACH.

The conventional model of the pure theory of international trade assumes that there are two goods produced non jointly using two factors of production and that traded goods are perfect substitutes for domestically produced goods. On the other hand in macroeconomics or in international finance, it is commonly assumed that output can be aggregated into one single commodity. In the Keynesian framework, if trade takes place, its main determinant is assumed to be income or output and the imported commodity is either a Leontief complement to the home produced good or an intermediate good which enters the production process together with domestic factors in fixed proportions to output.

In empirical applications, the theoretical framework is usually considerably altered and replaced by assumptions, whose implications are seldom properly investigated. For the remaining part of this chapter, we divide empirical studies related to the estimation of import and export functions into two sections:

(i) estimation of price elasticities of demand for imports or exports,

(ii) estimation of elasticities of substitution between imports (exports) from (to) different countries.

There have been a large number of empirical studies in both groups, many of them having been conveniently summarized by Cheng (1959), Prais (1962) and Leamer and Stern (1970). Because of the similarities between many of these studies, only a sample of the more recent ones will be reviewed here, the main emphasis being put upon the theoretical foundations of either approach.

2.1 Direct Estimation of Price Elasticities of Demand for Imports or Exports

The very large majority of researchers have estimated a variant of one of the two following functions:

$$(1) \qquad M = a + b\frac{y}{\bar{P}_D} + C\frac{\bar{P}_M}{\bar{P}_D} + u$$

$$(2) \qquad \ln M = \alpha + \beta \ln \frac{Y}{\bar{P}_D} + \gamma \ln \frac{\bar{P}_M}{\bar{P}_D} + v$$

where: M = quantity of imports

Y = nominal income

$\bar{P}_D$ = price of domestic goods

$\bar{P}_M$ = price of imports

u,v = error terms.

b and c are respectively the income and the price propensity to import, while β and γ are the income and the price elasticity of imports. The second functional form thus imposes the condition that both elasticities are constant.

If all imported and domestic goods are consumer goods, making use of conventional consumer theory, we can write the quantity of imports an individual i demands as follows:

$$(3) \qquad \begin{aligned} m_1^i &= d_1^i(Y^i, P_M, P_D) \\ m_2^i &= d_2^i(Y^i, P_M, P_D) \\ &\vdots \\ m_n^i &= d_n^i(Y^i, P_M, P_D) \end{aligned}$$

where Y^i is individual i's disposable income, P_M is the price vector of the imported goods and P_D is the price vector of the domestic goods. If both imports and domestic goods can be aggregated and if one further aggregates over all individuals, (3) becomes:

$$M = \bar{D}(Y, \bar{P}_M, \bar{P}_D),$$

or, assuming the absence of money illusion:

$$(4) \quad M = D\left(\frac{Y}{\bar{P}_D}, \frac{\bar{P}_M}{\bar{P}_D}, 1\right) = D'\left(\frac{Y}{\bar{P}_D}, \frac{\bar{P}_M}{\bar{P}_D}\right).$$

(1) and (2) are then merely functional forms for (4) which are used in the absence of any further knowledge about its actual form.

Similarly, the export function can be written as:

$$(5) \quad X = G\left(\frac{Y^*}{\bar{P}^*_D}, \frac{\bar{P}_X}{\bar{P}^*_D}\right)$$

where the asterisks refer to rest of the world variables.

If imports are composed of non finished goods which enter the production process in addition to domestic inputs, an equation similar to (4) can be derived from production theory if:

(i) there exists a homothetic aggregate production function;

(ii) aggregation over imports as well as over domestic inputs is possible.

In this case Y should be redefined as output and $\bar{P}_D$ would be the rental price of domestic inputs. An equation similar to (5) could also be derived for exports of non finished goods.

In view of the fact that imports are generally composed of both finished and non finished goods, the common procedure is to take for the income variable some proxy for both output and disposable income such as

GNP. The domestic price variable which is used is very often the wholesale price index. When import functions for various commodity groups are estimated, the standard method consists in trying for each equation a number of different income and domestic price variables and, in many instances, adding a variety of supplementary explanatory variables not accounted for by the basic model.[1]

Both functional forms (1) and (2) have been estimated by ordinary least square for various countries or commodity groups, using interwar or postwar data. Ball and Marwah (1962) used equation (1) to estimate United States import functions, imports being divided into six commodity groups. All equations were estimated for the period 1948-1958 with quarterly data, all right hand variables being lagged one quarter. As the income variable, they chose either GNP net of government wages and salary disbursment or disposable income. For the domestic price variable they used the wholesale price index except for the equation for food products where a food consumer price index was preferred. In some instances the authors also modified the model by adding such exogenous variables as the non wage to wage income ratio or the stock of the non ferrous metals, but with little success. The estimated price elasticities ranged from -0.26 to -3.50 and was -0.51 for aggregate imports; the income elasticity was 0.91 for total imports and was between 0.49 and 2.47 otherwise.

Houthakker and Magee (1969) estimated equation (2) for imports and exports of twenty six countries. Their income variable was GNP and the wholesale price was used as the domestic price variable. Most price elasticities had the right sign, but were in general smaller than one. For the United States they found an import price elasticity of -0.54, an export price elasticity of 1.51 while the income elasticities were 1.51 (imports) and 0.99 (exports). For Canada, the price elasticities were -1.46 (imports) and -0.59 (exports) and the income elasticities for imports and exports were respectively 1.20 and 1.41. Houthakker and Magee next estimated U.S. imports and exports by country using additional variables such as the price of a country's exports relative to the price of U.S. total imports and vice-versa. In order to obtain long run estimates of the elasticities, they estimated a flow adjustment model, the optimal amount of imports being itself determined by equation (2). Finally they estimated U.S. imports by commodity class for which the price elasticities ranged from -0.18 to -4.05.

Kemp (1962) estimated the linear functional form for twelve groups of imports to Canada for the period 1926-1955. Most of the estimated price elasticities had the correct sign but they all were smaller than 2 in absolute value. For total imports the price elasticity was -0.93 and the income elasticity was 0.96.

In his macro model of the Canadian economy, Rhomberg (1964) used equation (1) for both imports and exports. Seasonal dummy variables were added and the import equation also included an investment proxy as an explanatory variable. The price elasticities he obtained were of the order of -2 (exports) and -1 (imports).

Many empirical studies of the kind described in this section, especially those using interwar data, found very low estimates for the price elasticities of demand for imports or exports. Many economists have been hesitant to accept these estimates at their face value, arguing that the price elasticity of imports should be substantially higher than the price elasticity of either domestic demand or domestic supply. Indeed, if imports take place to fill a gap between home demand and home supply, the price elasticity of imports can be calculated from the following model where D, S and M denote respectively domestic demand, domestic supply and imports:

$$\begin{aligned} D &= D(p) \\ S &= S(p) \qquad (7) \\ M &= D - S \end{aligned}$$

The price elasticity of imports can then be expressed as:

$$(8) \qquad \varepsilon_M = \frac{dM}{dp}\,\frac{p}{M} = \frac{p}{M}\left(\frac{dD}{dp} - \frac{dS}{dp}\right) = \frac{D}{M}\,\varepsilon_D - \frac{S}{M}\,\varepsilon_S$$

One would thus expect ε_M to be considerably larger, in absolute terms than both ε_D and ε_S. There is however a substantial difference between the model underlying equation (8) and those which are made implicitly in deriving (4): in all empirical studies traded goods were assumed to be non perfect substitutes for domestic goods while in (7), traded goods are identical to the home produced goods.

In a well known paper, Orcutt (1950) made five objections to the traditional approach leading him to conclude that all least square estimates of price elasticities were biased towards zero and that new methods of estimation had to be found. Orcutt's objections were as follows:

(i) Errors and bias due to shifts in the demand surface. If a country faces a positively sloped supply curve the estimated price elasticity of demand for imports will in fact be a combination of the negative demand and the positive supply price elasticity, i.e. the demand elasticity will be biased towards zero. This is the familiar Working (1927) identification problem. Any shift in the demand schedule would lead to a change in both the observed price and quantity. Hence the error term of the demand equation is not independent of the price variable or the quantity of imports not explained by income, which violates the assumptions of the ordinary least square method.

(ii) Estimation of short-run rather than long-run elasticities. If no lags are used, the estimated elasticities tend to take into account the adjustment which occurs within one period only.

(iii) Errors and bias due to errors of observation. The least square estimate of the price elasticity of imports will be biased towards zero unless the price and income variables are measured without error. However if the variables are subject to large variations over the observed period, then any bias would be minimal.

(iv) Errors due to aggregation. Orcutt argues that since historical price changes are largest for goods with low price elasticities, the changes in the aggregate price index are mainly due to goods with low elasticities, which corresponds to only small quantity changes. This would lead to a low estimate of the price elasticity of total import demand.

(v) The price elasticity of demand for imports or exports may be larger for large price change than for small price changes. One reason for this, following Orcutt, would be the cost to the consumer or the importer involved in shifting from one supply source to another. It seems however that whether or not a large price change (e.g. after a devaluation) leads to a proportionally larger quantity change than a small price change remains an open question.

Orcutt's views were supported by a number of authors, Machlup (1950), Harberger (1953, 1957) or Neisser (1958) to mention a few. Some of Orcutt's objections however appear debatable, the last one for instance, or could be applied to nearly all econometric studies. The first objection is more fundamental. It can be argued however, that at least for small countries, the price of traded goods can be considered as exogenous, in which case the problem disappears. A consensus seems to have emerged in more recent years that the least square approach could still be used for many empirical studies.[2]

In this thesis we do not directly deal with Orcutt's objections. There are however a number of other reasons why the traditional method to estimate price elasticities is not satisfactory and it is the object of this thesis to improve the analysis on these points. First there is the number of ad hoc assumptions which have been made in choosing the explanatory variables. Not only are many variables used as proxy for other ones, but also many additional variables are introduced into the analysis without any theoretical justification.

Secondly, one may seriously object to the assumption that the utility function (or the production function as it stands) is separable between imported goods and domestic goods. This is implicitly assumed when both imported and domestic goods are aggregated. This implies that at any point the elasticity of substitution between any imported good and any domestic good is the same. This assumption is even more objectionable when several import functions are estimated for different commodity groups since it then assumes that each import in turn is separable not only from all domestic goods but also from all other imports. The model becomes definitely confused when some goods are treated as intermediate products and others as final goods.

Finally the estimation would be much more efficient if instead of estimating isolated import and export functions, one estimated the whole system simultaneously. This would also allow one to impose constraints across equations (e.g. symmetry constraints).

2.2 Estimation of Elasticities of Substitution between Imports (Exports) from (to) Different Countries

The estimation of elasticities of substitution between imports or exports is often viewed as an alternative way of estimating price elasticities. Assume a production function or a utility function with commodities $x_1, \ldots x_n$ for arguments. The Allen-Hicks elasticity of substitution along an isocurve has been defined as:[3]

$$\sigma_{ij} = \frac{\partial \ln(x_i/x_j)}{\partial \ln(\partial x_j/\partial x_i)}.$$

In competitive equilibrium, since:

$$-\frac{P_i}{P_j} = \frac{\partial x_j}{\partial x_i},$$

the elasticity of substitution for movements along a two dimensional isocurve can be written as:

$$\sigma_{ij} = \frac{\partial \ln(x_i/x_j)}{\partial \ln(p_i/p_j} .$$

In empirical studies, the function which has almost invariably been estimated is the logarithmic form:

$$(9) \quad \ln \frac{x_1}{x_2} = \alpha + \beta \ln \left(\frac{p_1}{p_2} \right) + u$$

where x_1 and x_2 are import (export) quantities of similar commodities but from (to) different countries or regions, p_1 and p_2 are their respective prices and β is the estimated elasticity of substitution, which, it should be noted, is assumed to be constant.

Zelder (1958) compared manufactured exports of the United Kingdom with those of the United States, dividing them into twenty seven groups and twelve subgroups. He logarithmically regressed both x_1/x_2 on p_1/p_2 and p_1/p_2 on x_1/x_2 over the period 1921-1938 and calculated the elasticity of substitution as the geometric average of the two values he thus obtained. All estimates were between -1.2 and -12.8, but for total manufactures however his estimate was positive, a result he blamed on aggregation errors and the different composition of exports of the two countries. Zelder then distinguished between devaluation elasticities of substitution (when the prices of all of a country's exports move together, i.e. no or little substitution between exports of one country) and non devaluation elasticities of substitution (when all prices but one are held constant). As Kaliski (1958) pointed out however, the estimates of the elasticities of substitution are only efficient and unbiased if all cross-elasticities of demand for the two country's exports of the same good as well as the income elasticities are equal,[4] in which case it becomes impossible to distinguish devaluation from non devaluation elasticities.

Surprisingly enough, only few authors attempted to give a rigorous interpretation to the elasticities they had estimated, although the problems of estimating elasticities of substitution and the implication of the particular functional forms have been discussed extensively elsewhere, e.g., in Morrisset (1953) or in Goldberger (1967).

From (9) the measured elasticity can be written as:

$$(10) \qquad \beta = \frac{d \ln(x_1/x_2)}{d \ln(p_1/p_2)} .$$

This quantity is equal to the Allen-Hicks elasticity of substitution only if it is measured along an isocurve, but in all empirical studies β is the total effect rather than the pure substitution effect. For the two effects to be the same, two conditions must be satisfied:

(i) the isocurves must be homothetic;

(ii) if there are more than two goods in the economy, the mapping between the two first goods must be independent of the quantities or prices of the other goods.

What this implies can be shown as follows. Assume there are n goods, $x_1, x_2, \ldots x_n$, (the goods are either imported or domestically produced) in the home economy and that x_1 and x_2 are similar commodities, but imported from different sources. The demand equations can be written as:

$$(11) \qquad x_i = x_i(p_1, p_2, \ldots p_n, y) \qquad\qquad i = 1, \ldots n$$

where y is income (it alternatively could be output). The budget constraint has to be satisfied:

$$p'x = y$$

and the total effect of a change in relative prices p_1/p_2 on relative quantities x_1/x_2 can be written as:

$$\frac{d\ \ln(x_1/x_2)}{d\ \ln(p_1/p_2)} = \frac{\partial \ln(x_1/x_2)}{\partial \ln(p_1/p_2)} + \ldots + \frac{\partial \ln(x_1/x_2)}{\partial \ln x_n}\ \frac{d\ \ln x_n}{d\ \ln(p_1/p_2)} + \frac{\partial \ln(x_1/x_2)}{\partial \ln y}\ \frac{d\ \ln y}{d\ \ln(p_1/p_2)}$$

For $\beta = \sigma_{12}$ to be satisfied, one of the following relations must hold:

$$\frac{d\ \ln y}{d\ \ln(p_1/p_2)} = 0 \quad \text{or} \quad \frac{\partial \ln(x_1/x_2)}{\partial \ln y} = 0,$$

i.e. either income is held constant or the mapping between x_1 and x_2 is homothetic which implies that at any point the income elasticities of the two goods are the same.

Furthermore if there are more than two goods in the economy it must also be true that:

$$\frac{d\ \ln x_i}{d\ \ln(p_1/p_2)} = 0 \text{ or } \frac{\partial \ln(x_1/x_2)}{\partial \ln x_i} = 0 \qquad i = 3, \ldots n,$$

i.e. the mapping between x_1 and x_2 must be invariant to a change in the quantity x_i or the quantity x_i is not affected by a change in relative price (p_1/p_2).

Because of the ambiguities of the measure of an individuals's elasticity of substitution between two goods plus the conceptual difficulties of community indifference curves, one could be tempted to estimate (10) without any reference to the concept of the elasticity of substitution. β can be written as:

$$\beta = \frac{\varepsilon_{11} - \varepsilon_{21}}{1 - \frac{d\ln p_2}{d\ln p_1}} + \frac{\varepsilon_{12} - \varepsilon_{22}}{\frac{d\ln p_1}{d\ln p_2} - 1} + \ldots + \frac{\varepsilon_{1n} - \varepsilon_{2n}}{\frac{d\ln p_1 - d\ln p_2}{d\ln p_n}} + \frac{\eta_1 - \eta_2}{\frac{d\ln p_1 - d\ln p_2}{d\ln y}}$$

where $\varepsilon_{ij} = \frac{\partial \ln x_i}{\partial \ln p_j}$ and $\eta_i = \frac{\partial \ln x_i}{\partial \ln y}$ $i,j = 1, \ldots n.$

Hence β redefined is not a simple concept: it is a complex function of price and income elasticities (which in general will not be constant) and its meaning is rather obscure. In addition, even if all demand equations (11) are known, the terms $d\ln p_i/d\ln p_j$ and $d\ln p_i/d\ln y$ ($i=1,2$; $j=1, \ldots n$) are in general unknown so that β will be indeterminate unless further assumptions are made. Forcing β to be a constant, as it is done in nearly all empirical studies, is much more restrictive than it first appears: it is equivalent to adding n constraints to the model which in turn allow β to be uniquely determined.

From the definition of β we have:

(12) $d\ln x_1 - d\ln x_2 = \beta(d\ln p_1 - d\ln p_2)$

and by logarithmic differentiation of the first two equations in (11):

$$d\ln x_1 = \varepsilon_{11}\, d\ln p_1 + \varepsilon_{12} d\ln p_2 + \ldots \varepsilon_{1n} d\ln p_n + \eta_1 d\ln y$$

(13)

$$d\ln x_2 = \varepsilon_{21}\, d\ln p_2 + \varepsilon_{22} d\ln p_2 + \ldots \varepsilon_{2n} d\ln p_n + \eta_2 d\ln y$$

(12) and (13) imply:

(14) $\varepsilon_{11} - \varepsilon_{21} = \varepsilon_{12} - \varepsilon_{22}$ (=β=constant)

$\eta_1 = \eta_2$

$\varepsilon_{1i} = \varepsilon_{2i}$ $i = 3, \ldots n.$

These are the n relations allowing β to be uniquely determined. They imply severe restrictions on the form of the demand functions or the underlying technology or preference map. Note that (14) are again the conditions ensuring that $\beta = \sigma_{12}$.

Ignoring the ambiguous character of β, several authors have attempted to derive from it estimates of the price elasticity of import functions. It is well known that:[5]

$$(15) \quad x_1 p_1 \left(\frac{\partial x_1}{\partial p_1}\frac{p_1}{x_1}\right)\Big|_{U=\bar{U}} + x_2 p_2 \left(\frac{\partial x_2}{\partial p_1}\frac{p_1}{x_2}\right)\Big|_{U=\bar{U}} + \ldots + x_n p_n \left(\frac{\partial x_n}{\partial p_1}\frac{p_1}{x_n}\right)\Big|_{U=\bar{U}} = 0$$

which is sometimes written as:

$$(16) \quad x_1 p_1 \varepsilon_{11} + x_2 p_2 \varepsilon_{21} + \ldots + x_n p_n \varepsilon_{n1} = 0$$

By (14) this becomes:

$$\varepsilon_{11} = \frac{x_2 p_2}{x_1 p_1 + x_2 p_2}\beta - \sum_3^n \frac{x_i p_i}{x_1 p_1 + x_2 p_2}\varepsilon_{i1}$$

or, if all commodities are net substitutes:

$$\varepsilon_{11} \leq \frac{x_2 p_2}{x_1 p_1 + x_2 p_2}\beta .$$

One could thus obtain an upper bound to the actual price elasticity. This derivation follows Harberger's (1957) treatment. Zelder's (1958) formula is essentially the same. This procedure is however hardly acceptable since it is not legitimate to replace (15) by (16). In (15) $(\partial x_i/\partial p_1)/(p_1/x_i)\,\big|_{U=\bar{U}}$ is a price substitution term, i.e. net of any income effect, while in (16) ε_{ij} is the total substitution effect.

We conclude this section with what may seem to be the best interpretation of β. Morrissett (1953) showed that (β+1) is the measure of the elasticity of substitution between market shares, but it does not give any indication about absolute values. This is also the interpretation given to β by Junz and Rhomberg (1973) in analysing the response of trade flows to changes in relative prices. One may seriously doubt about the usefulness of any attempt to estimate the Allen-Hicks elasticity of substitution, either per se or in order to calculate price elasticities.

3. THE MODEL

3.1 General Description

In this chapter a system of import and export functions consistent with some underlying behavioural assumption will be derived in an attempt to avoid some of the more serious shortcomings of the traditional approach. For this purpose a model of a country's technology will be formulated. It will be assumed that import and export decisions are made by profit maximizing firms which operate under perfect competition both in the commodity markets and in the factor markets. Imports and exports are thus considered respectively as inputs to, and outputs of, the technology. Under these conditions it is well known that the competitive equilibrium is also the solution of maximizing GNP at any period of time subject to the technology, the factor endowments and a vector of output prices. The behavioural assumption underlying the model can therefore be written as:

$$\max p'y \quad \text{s.t.} \ (y;x) \in T$$

where T is the production possibility set, y a vector of outputs (imports being considered as a negative output rather than a fixed input[6]) x a vector of domestic factor endowments and p an output price vector.

A multiple-input multiple-output technology can thus be represented by the production possibility set. Alternatively, if certain regularity conditions are met, and since profit maximization is assumed, it can be represented by a transformation or a profit function. There thus exists a duality principle between production possibility sets and profit functions similar to that which exists between production functions and cost functions. If one or more goods or factors are considered to be fixed, the dual of the production possibility set becomes a variable profit function. The variable profit function is the formulation adopted in this thesis to describe the technology, largely because of the similarities with the conventional model of international trade, i.e. because output prices can be taken as exogenous and quantities of primary factors are assumed to be fixed in the short run.

This model should therefore improve the analysis relatively to the traditional approach in the following way:

(i) A coherent and complete system of output supply (including import demand) equations will be derived and estimated simultaneously.

(ii) By using a very flexible functional form, no a priori assumption on separability or on the degree of complementarity or substitutability between goods or factors will have to be made.

(iii) No ad hoc assumption will have to be made in the choice of particular variables and no supplementary explanatory variable will have to be introduced without theoretical justification.

(iv) The framework is well suited to studying the effect of changes in various government policy parameters such as tariffs, taxes on intermediate inputs and final outputs.

The analysis, however, will still be subject to at least three of Orcutt's objections.

(i) All output prices will be taken as exogenous. To make them endogenous would require a general equilibrium model which is beyond the scope of this thesis. Another way to avoid any bias would be to use instrumental variables, but their choice would be somewhat arbitrary. Regarding imports and exports, it will therefore be assumed that Canada is a small open economy and acts like a price-taker.[7]

(ii) The model will only estimate short run demand and supply functions. Optimization is assumed to be instantaneous. This impact model, as it could be characterized, is still of considerable interest. Moreover the choice of a particular lag structure would be arbitrary, since our theoretical framework makes no allowance for it.

(iii) The aggregation problem is still present. Current econometric techniques do not allow us to disaggregate beyond ten to fifteen goods.

3.2 The Variable Profit Function: Some Concepts in Duality Theory.

The concept of the variable profit function was initially introduced by Samuelson (1953-54) and has been discussed by Gorman (1968), Diewert (1973, 1974a) and Lau (1974a) among others. This whole section will be based on Diewert (1973, 1974a) to whom the reader is referred for a proof of the theorems and lemmas.

Henceforth we will denote variable inputs or outputs by y_i, $i = 1, \ldots, I$ (y_i is positive if an output, negative otherwise), fixed inputs or outputs (positive and negative respectively) by x_j, $j=1, \ldots, J$, prices of variable quantities by p_i and prices of fixed quantities by w_j. The vector of those quantities or prices will be denoted by the corresponding letter, but without subscript.

The economy's feasible set of inputs and outputs is denoted by T and is called the production possibility set. The following assumptions are made on T:[8]

I.1. T is a closed, non empty subset of I + J dimensional space.

I.2. T is a convex set.

I.3. if $z' \in T$, $z'' \leq z'$, then $z'' \in T$.

I.4. if $(y;x) \in T$, then the components of y are bounded from above for x fixed.

The variable profit function is then defined as:

$$\Pi(p;x) = \begin{cases} \max_y \{p'y : (y;x) \in T,\ p \gg \bar{0}\} \\ -\infty \text{ if no } y \text{ exists such that } (y;x) \in T \end{cases}$$

where $p \gg \bar{0}$.

When T satisfies I.1 to I.4 and $p \gg \bar{0}$, Π is well defined and satisfies the following conditions:

II.1 $\Pi(p;x)$ is a real extended function defined for all $p \gg \bar{0}$ and any x.

II.2 $\Pi(p;x)$ is homogenous of degree one in p.

II.3 $\Pi(p;x)$ is convex in p for every fixed x.

II.4 $\Pi(p;x)$ is concave in x for every fixed p.

II.5 $\Pi(p;x)$ is increasing or decreasing with respect to p, depending on whether the corresponding good is a variable output or input respectively.

II.6 $\Pi(p;x)$ is increasing or decreasing with respect to x depending on whether the corresponding good is a fixed input or output respectively.

The production possibility set T corresponding to Π can be defined as:

$$T \equiv \{(y;x) : p'y \leq \Pi(p;x) \text{ for every } p >> \bar{0}\}.$$

When Π satisfies II.1 to II.6, then T so defined will satisfy I.1 to I.4 and the variable profit function corresponding to T will coincide with Π.

If the variable profit function $\Pi(p;x)$ satisfies (II) and is in addition differentiable with respect to the components of p at $p^* >> \bar{0}$ and x^*, then:

$$\frac{\partial \Pi(p^*;x^*)}{\partial p_i} = y_i(p^*;x^*) \qquad i=1,\ldots I.$$

This result is known as Hotelling's (1932) lemma and is analogous to Shephard's (1953) lemma which applies to cost functions.

Finally, if $\Pi(p;x)$ is differentiable at $p^* >> \bar{0}$ and x^* with respect to the components of x, then:

$$\frac{\partial \Pi(p^*;x^*)}{\partial x_j} = \tilde{w}_j(p^*;x^*),$$

where $\tilde{w}_j$ is the shadow price of fixed quantity x_j.

Upon formulating a functional form for the variable profit function, it is possible to derive the system of demand and supply equations for the variable quantities by applying Hotelling's lemma. In addition we will assume that firms also optimize with respect to the fixed quantities (e.g. fixed factors are mobile between firms) and hence the shadow price of those quantities will be equal to their market price. This assumption is required in order to justify aggregation over firms and industries. We will thus obtain a system of supply or demand equations and of marginal productivity relations which can be estimated simultaneously.

3.3 Further Theoretical Concepts.

In order to describe the estimated technology, familiar concepts such as elasticities of transformation or price elasticities will be used.

For a production function F, the Allen (1938) partial elasticity of substitution between X_i and X_j is defined as:

$$\sigma_{ij} = \frac{\sum\sum F_h X_h \; | \bar{F}_{ij} |}{X_i X_j \; |\bar{F}|}$$

where $F_h = \partial F/\partial X_h$, $\bar{F}$ is the bordered Hessian of F and $\bar{F}_{ij}$ is the cofactor of $\partial^2 F/\partial X_i \partial X_j$ in $|\bar{F}|$.

If the production function is homothetic, Uzawa (1962) has shown that the elasticity of substitution can also be written in terms of the unit cost function C(w) as:

$$\sigma_{ij} = \frac{C \; C_{ij}}{C_i \; C_j}$$

where $C_i = \partial C/\partial w_i$ and $C_{ij} = \partial^2 C/\partial w_i \; w_j$.

Diewert (1974a) extended this concept to the class of variable profit functions by defining:

(i) an elasticity of transformation between variable quantities i and h:

$$\Theta_{ih}(p^*;x^*) \equiv \frac{\Pi(p^*;x^*) \; \partial^2 \; (p^*;x^*)/\partial p_i \partial p_h}{[\partial\Pi(p^*;x^*)/\partial p_i][\partial\Pi(p^*;x^*)/\partial p_h]} \qquad i, h=1, \ldots I$$

Θ_{ih} is thus a normalization of $\partial y_i/\partial p_h$, where Θ_{ih} is chosen invariant to the unit of measurement and $\Theta_{ih} = \Theta_{hi}$.

(ii) an elasticity of complementarity between fixed quantities j and k;

$$\sigma_{jk}(p^*;x^*) \equiv \frac{\Pi(p^*;x^*)\partial^2\Pi(p^*;x^*)/\partial x_j \partial x_k}{[\partial\Pi(p^*;x^*)/\partial x_j][\partial\Pi(p^*;x^*)/\partial x_k]} \quad j, k=1, \ldots J$$

(iii) an elasticity of intensity between variable quantity i and fixed quantity j:

$$\psi_{ij}(p^*;x^*) \equiv \frac{\Pi(p^*;x^*)\ \partial^2\Pi(p^*;x^*)/\partial p_i \partial x_j}{[\partial\Pi(p^*;x^*)/\partial p_i]\ [\partial\Pi(p^*;x^*)/\partial x_j]} \quad \begin{matrix} i=1, \ldots I \\ j=1, \ldots J \end{matrix}$$

The partial price elasticities of the variable quantities can be defined as:

$$\varepsilon_{ih} \equiv \frac{\partial y_i}{\partial p_h}\frac{p_h}{y_i} \qquad i, h=1, \ldots I$$

The inverse partial price elasticity for fixed inputs is:

$$\eta_{jk} \equiv \frac{\partial w_j}{\partial x_k}\frac{x_k}{w_j} \qquad j, k=1, \ldots J$$

and similarly:

$$\xi_{ij} \equiv \frac{\partial y_i}{\partial x_j}\frac{x_j}{y_i} \qquad i = 1, \ldots I \qquad j=1, \ldots J$$

$$\rho_{ji} \equiv \frac{\partial w_j}{\partial p_i}\frac{p_i}{w_j} \qquad i = 1, \ldots I \qquad j=1, \ldots J$$

Finally the following relations hold:[9]

$$\Theta_{ih} = \varepsilon_{ih}/S_h = \varepsilon_{hi}/S_i$$

$$\sigma_{jk} = \eta_{jk}/V_k = \eta_{kj}/V_j$$

$$\psi_{ij} = \xi_{ij}/V_j = \rho_{ji}/S_i$$

where $S_i \equiv p_i y_i/\Pi$ is variable output i's share of national product, and $V_j \equiv x_j \omega_j/\Pi$ is fixed input j's share of national product.

3.4 Two Step Optimization.

In the case where two or more variable quantities are separable from the remaining quantities,[10] the optimization process can be decomposed into two steps as follows. Assume that the transformation function can be written as:

$$t(y_1) = \hat{t}(y_2;x)$$

where y_1 denotes the vector of the variable quantities which is weakly separable from the other goods and y_2 is the vector of the remaining variable quantities. The variable profit function then becomes:

$$\Pi(p;x) = \begin{cases} \max_{y_1,y_2} \{p_1'y_1 + p_2'y_2 : t(y_1) = \hat{t}(y_2;x), p_1, p_2 >> \bar{0}\} \\ -\infty \text{ if no } y_1, y_2 \text{ exist such that } t(y_1) = \hat{t}(y_2;x) \end{cases}$$

The following subfunction can now be defined:

$$R(p_1;z) = \max_{y_1} \{p_1'y_1 : \ z = t(y_1),\ p_1 >> \bar{0}\}$$

z is a scalar (the aggregate of the y_1's), R is the revenue function and if t is homogenous of degree one, we may write:

$$R(p_1;z) = z\, r(p_1).$$

The original profit maximization problem now becomes:

$$\Pi(p;x) = \begin{cases} \max_{z,y_2} \{z\, r(p_1) + p_2'y_2 : z = \hat{t}(y_2;x),\ p_2 >> \bar{0}\} \\ -\infty \text{ if no } z\ y_2, \text{ exist such that } z = \hat{t}(y_2;x). \end{cases}$$

$$= \quad \tilde{\Pi}(r(p_1),\ p_2;x)$$

4. FUNCTIONAL FORM AND ESTIMATION TECHNIQUE.

4.1 The Translog Variable Profit Function.

The translog functional form will be used in this thesis to estimate the variable profit function. The transcendental logarithmic functional form has been proposed by several authors as a production function and has subsequently been suggested as a second order approximation to any twice continuously differentiable production or cost function by Christensen, Jorgenson and Lau (1971). Because of its quadratic character, no a priori restrictions on the value of the various elasticities of transformation are imposed.

A second order approximation at the expansion point of the variable profit function $\Pi = \Pi(p;x)$ can be obtained by the logarithmic Taylor series expansion:

$$\ln \Pi = \ln \Pi(0) + \sum_j \frac{\partial \ln \Pi}{\partial \ln p_i} \ln p_i + \sum_j \frac{\partial \ln \Pi}{\partial \ln x_j} \ln x_j$$

$$+ \frac{1}{2} \sum_i \sum_h \frac{\partial^2 \ln \Pi}{\partial \ln p_i \ \partial \ln p_h} \ln p_i \ \ln p_h + \frac{1}{2} \sum_j \sum_k \frac{\partial^2 \ln \Pi}{\partial \ln x_j \partial \ln x_k} \ln x_j \ln x_k$$

$$\sum_i \sum_j \frac{\partial^2 \ln \Pi}{\partial \ln p_i \ \partial \ln x_j} \ln p_i \ \ln x_j,$$

which can be written more conveniently as:

$$\ln \Pi = \alpha_0 + \sum \alpha_i \ \ln p_i + \frac{1}{2} \sum\sum \gamma_{ih} \ \ln p_i \ \ln p_h$$

$$+ \sum \beta_j \ \ln x_j + \frac{1}{2} \sum\sum \phi_{jk} \ \ln x_j \ \ln x_k$$

$$+ \sum\sum \delta ij \ \ln p_i \ \ln x_j$$

where obviously $\gamma_{ih} = \gamma_{hi}$ and $\phi_{jk} = \phi_{kj}$. If the translog function is considered as a functional form per se, the equalities $\gamma_{ih} = \gamma_{hi}$ and $\phi_{jk} = \phi_{kj}$ are not necessarily satisfied, but may be imposed without any loss of generality.[11]

By definition the variable profit function is linear homogenous in prices; in the translog case, we must therefore have (see Diewert (1974a)):

(i) $\sum_i \alpha_i = 0$ (ii) $\sum_i \gamma_{ih} = 0$ (iii) $\sum_i \delta_{ij} = 0$

In addition, if the variable profit function is also homogenous of degree one in fixed quantities, then we must have:

(i) $\sum_j \beta_j = 0$ (ii) $\sum_j \phi_{jk} = 0$ (iii) $\sum_j \delta_{ij} = 0$

Henceforth linear homogeneity in fixed quantities will be imposed since our data have been constructed on the basis of this assumption.[12]

Assuming that the translog variable profit function satisfies at least locally conditions (II), Hotelling's lemma can be applied:

$$S_i(p^*;x^*) = \frac{p_i^* y_i^*}{\Pi(p^*;x^*)} = \frac{\partial \ln \Pi(p^*;x^*)}{\partial \ln p_i} = \alpha_i + \sum_h \gamma_{ih} \ln p_h + \sum_j \delta_{ij} \ln x_j$$

where, because of the linear homogeneity in prices, $\sum_i S_i = 1$.

The marginal productivity relations are derived similarly as:

$$V_j(p^*;x^*) = \frac{w_j^* x_j^*}{\Pi(p^*;x^*)} = \frac{\partial \ln \Pi(p^*;x^*)}{\partial \ln x_j} = \beta_j + \sum_i \delta_{ij} \ln p_i + \sum_k \phi_{jk} \ln x_k$$

and because of linear homogeneity in fixed quantities, $\sum_j V_j = 1$.

For the translog functional form, the elasticities of transformation, complementarity and intensity are:

$$\theta_{ih} = \frac{\gamma_{ih} + S_i S_h}{S_i S_h}, \quad i \neq h \qquad \theta_{ii} = \frac{\gamma_{ii} + S_i(S_i - 1)}{S_i^2}$$

$$\sigma_{jk} = \frac{\phi_{jk} + V_j V_k}{V_j V_k}, \; j \neq k \qquad \sigma_{kk} = \frac{\phi_{kk} + V_k(V_k - 1)}{V_k^2}$$

$$\psi_{ij} = \frac{\delta_{ij} + S_i V_j}{S_i V_j} .$$

4.2 Regularity Conditions.

The translog variable profit function does not, in general, satisfy regularity conditions (II). Instead it will be necessary to verify that those conditions do indeed hold over the observed range of prices and quantities.

Monotonicity requires:[13]

$$(\text{sign } y_i)\; S_i \geq 0 \qquad i=1, \ldots I$$

$$(\text{sign } x_j)\; V_j \geq 0 \qquad j=1, \ldots J$$

This can easily be verified for each observation. The adding up property of the S shares will guarantee linear homogeneity in prices if symmetry is also imposed. Finally the curvature conditions have to be verified: the variable profit function must be convex in prices and concave in fixed quantities. A necessary and sufficient condition is that the Hessian $\partial^2\Pi/\partial p_i \partial p_h$ is positive semi-definite and the Hessian $\partial^2\Pi/\partial x_j \partial x_k$ is negative semi-definite. Or alternatively the matrix of the elasticities of transformation [γ] has to be positive semi-definite and the matrix of the elasticities of complementarity [ϕ] negative semi-definite. The Hessian $\partial^2\Pi/\partial p_i \partial p_h$ can indeed be written as:

$$H = \Pi \, p' \, C \, p$$

where

$$C = \begin{bmatrix} \gamma_{11} + S_1(S_1 - 1) & \gamma_{12} + S_1 S_2 \cdots & \gamma_{1I} + S_1 S_I \\ \gamma_{21} + S_1 S_2 & \gamma_{22} + S_2(S_2 - 1) \cdots & \gamma_{2I} + S_2 S_I \\ & \vdots & \vdots \\ \gamma_{I1} + S_I S_1 & \gamma_{I2} + S_I S_2 \cdots & \gamma_{II} + S_I(S_I - 1) \end{bmatrix}$$

and C has to be positive semi-definite as well, i.e.

$$y' \, C \, y \geq 0 \quad \text{for any } y \in R^I.$$

If D is a I by I matrix of full rank, there exists an x in R^I for any y such that y = D X and therefore:

$$x' D' \, C \, D \, x \geq 0 \quad \text{for any } x \in R^I.$$

Now if D is defined as:

$$D = \begin{bmatrix} 1/S_1 & 0 \; . \; . \; . & 0 \\ 0 & 1/S_2 \; . \; . & 0 \\ \vdots & \vdots & \vdots \\ 0 & 0 \; . \; . & 1/S_I \end{bmatrix}$$

D is indeed of full rank and $D' \, C \, D = [\Theta]$ is positive semi-definite. A similar proof applies to $[\sigma]$ which is negative semi-definite if and only if the Hessian $\partial^2 \Pi / \partial x_j \partial x_k$ is negative semi-definite. It is convenient to compute the eigenvalues of both matrices and verify that, for each observation, they all are non-negative and non-positive respectively.

Lau (1974a,b) and Jorgenson (1973) suggested a procedure which makes it possible to impose the correct curvature at the expansion point. The Hessian $\partial^2\Pi/\partial p_i \partial p_h$ of the translog profit function at the expansion point can be written as:

$$H = e^{\alpha_o} C$$

At the expansion point:

$$C = \begin{bmatrix} \gamma_{11} + \alpha_1(\alpha_1 - 1) & \gamma_{12} + \alpha_1\alpha_2 & \cdots & \gamma_{1I} + \alpha_1\alpha_I \\ \gamma_{21} + \alpha_2\alpha_1 & \gamma_{22} + \alpha_2(\alpha_2 - 1) & \cdots & \gamma_{2I} + \alpha_2\alpha_I \\ \vdots & \vdots & & \vdots \\ \gamma_{I1} + \alpha_I\alpha_1 & \gamma_{I2} + \alpha_I\alpha_2 & \cdots & \gamma_{II} + \alpha_I(\alpha_I - 1) \end{bmatrix}$$

Since any positive or negative semi-definite matrix is Choleski decomposable, C can be written as:

$$C = T\,D\,T'$$

where T is a unit lower triangular matrix and D is a diagonal matrix. Furthermore for C to be positive (negative) semi-definite, a necessary and sufficient condition is that all diagonal elements of D - the Choleski values - are positive (negative). Writing these elements as $(\pm)\, d_{ii}^2$, it is thus possible to estimate the model (using non linear techniques) imposing the correct curvature conditions at the expansion point.

4.3 Technological Change.

It is desirable to allow technological change to take place and the absence of such changes in the technology is a hypothesis which should be tested. Several authors, in particular Jorgenson (1974), have suggested introducing e^t as an additional fixed input into the profit function. Time is thus treated as an additional fixed input, the rental price of which is zero. Appelbaum and Harris (1974) used t as the extra input. Their treatment is therefore essentially the same as Jorgenson's, but it requires, (using the translog functional form) an arbitrary normalization of the time variable.[14] Instead of using the notion of a missing input, we will allow directly for factor augmenting disembodied technological progress, both at the input level and at the output level.

Let us redefine our variables by specifying an exponential rate of technological change:

$$q_i = p_i \, e^{-\mu_i t} \qquad i = 1, \ldots I \text{ and } \mu_I = 0$$

$$v_j = x_j \, e^{\lambda_j t} \qquad j = 1, \ldots J$$

x_j is thus the observed fixed input quantity while v_j is the augmented quantity. Similarly p_i is the observed price of variable output i while q_i is the price of the augmented output. Only I+J-1 of the coefficients can be independent which requires the normalization of one coefficient. This contrasts with the usual one output model where the normalization is made implicitly on the output.

In terms of its augmented characteristics, the translog variable profit function becomes:

$$\ln \Pi(q;v) = \alpha_o + \sum \alpha_i (\ln p_i - \mu_i t)$$

$$+ \frac{1}{2} \sum\sum \gamma_{ih} (\ln p_i - \mu_i t) (\ln p_h - \mu_h t)$$

$$+ \sum \beta_j (\ln x_j + \lambda_j t) + \frac{1}{2} \sum\sum \phi_{jk} (\ln x_j + \lambda_j t) (\ln x_k + \lambda_k t)$$

$$+ \sum\sum \delta_{ij} (\ln p_i - \mu_i t) (\ln x_j + \lambda_j t) .$$

This can also be written as:

$$\ln \Pi(q;v) = \alpha_o + \sum \alpha_i \ln p_i + \frac{1}{2} \sum\sum \gamma_{ih} \ln p_i \ln p_h$$

$$+ \sum \beta_j \ln x_j + \frac{1}{2} \sum\sum \phi_{jk} \ln x_j \ln x_k$$

$$+ \sum\sum \delta_{ij} \ln p_i \ln x_j + \beta_t t + \sum \delta_{it} \ln p_i t$$

$$+ \sum \phi_{jt} \ln x_j t + \frac{1}{2} \phi_{tt} t^2$$

where $\beta_t = -\sum \alpha_i \mu_i + \sum \beta_j \lambda_j$

$$\delta_{it} = -\sum \gamma_{ih} \mu_h + \sum \delta_{ij} \lambda_j$$

$$\phi_{jt} = -\sum \delta_{ij} \mu_i + \sum \phi_{jk} \lambda_k$$

$$\phi_{tt} = \sum\sum \gamma_{ih} \mu_i \mu_h + \sum\sum \phi_{jk} \lambda_j \lambda_k - 2\sum\sum \delta_{ij} \mu_i \lambda_j .$$

Note that linear homogeneity of the profit function in both prices and fixed input implies that:

(i) $\sum_i \delta_{it} = 0$ for $\sum_i \gamma_{ih} = 0$ and $\sum_i \delta_{ij} = 0$, $\forall h,j$

(ii) $\sum_j \phi_{jt} = 0$ for $\sum_j \delta_{ij} = 0$ and $\sum_j \phi_{jk} = 0$, $\forall j,k$.

δ_{it} and ϕ_{jt} can be rewritten as:

$$\delta_{it} = -\sum_{h=1}^{I-1} \gamma_{ih}(\mu_h - \mu_I) + \sum_{j=1}^{J-1} \delta_{ij}(\lambda_j - \lambda_J)$$

$$\phi_{jt} = -\sum_{i=1}^{I-1} \delta_{ij}(\mu_i - \mu_I) + \sum_{k=1}^{J-1} \phi_{jk}(\lambda_k - \lambda_J)$$

and similarly:

$$\beta_t = -\sum_{i=1}^{I-1} \alpha_i(\mu_i - \mu_I) + \sum\sum_{j=1}^{J-1} \beta_j(\lambda_j - \lambda_J) - \mu_I + \lambda_J$$

$$\phi_{tt} = -\sum\sum_{i=1}^{I-1} \delta_{it}(\mu_i - \mu_I) + \sum_{j=1}^{J-1} \phi_{jt}(\lambda_j - \lambda_J)$$

If one estimates only the δ_{it}'s and the ϕ_{jt}'s, it is only possible to solve for I + J - 2 coefficients of technological change, or alternatively for I - 1 terms $\mu_i - \mu_I$ and J - 1 terms $\lambda_j - \lambda_J$. Estimating β_t would allow to solve for λ_J while the last coefficient has to be normalized. Finally, ϕ_{tt} would have to be constrained. This formulation is thus similar to introducing e^t as a fixed input except for the constraint on ϕ_{tt}.[15]

The share equations now become:

$$S_i = \frac{\partial \ln \Pi}{\ln p_i} = \alpha_i + \sum \gamma_{ih} \ln p_h + \sum \delta_{ij} \ln x_j + \delta_{it} t = \frac{p_i y_i}{\Pi}$$

$$V_j = \frac{\partial \ln \Pi}{\partial \ln x_j} = \beta_j + \sum \delta_{ij} \ln p_i + \sum \phi_{jk} \ln x_k + \phi_{jt} t = \frac{w_j x_j}{\Pi}$$

In addition, we can differentiate Π with respect to t:

$$\frac{\partial \ln \Pi}{\partial t} = \alpha_t + \sum \delta_{it} \ln p_i + \sum \phi_{jt} \ln x_j + \phi_{tt} t$$

where $\frac{\partial \ln \Pi}{\partial t}$ measures the percentage change in profits due to technological change. Alternatively the share equations can be written as:

$$S_i = \frac{\partial \ln \Pi}{\partial \ln q_i} = \frac{q_i s_i}{\Pi} \quad \text{and} \quad V_j = \frac{\partial \ln \Pi}{\partial \ln v_j} = \frac{v_j u_j}{\Pi}$$

where $s_i = y_i\ e^{\mu_i t}$ and $u_j = w_j\ e^{-\lambda_j t}$ are respectively the unobserved shadow variable quantities and fixed quantity prices corresponding to q_i and v_j.

In this context, technological change can be said to be Hicks neutral when:

(i) $\mu_i = \bar{\mu}\ , \forall i$ (ii) $\lambda_j = \bar{\lambda}\ , \forall j$

but it is not necessary that $\bar{\mu} = \bar{\lambda}$. If technological change is Hicks neutral, the δ_{it}'s, ϕ_{jt}'s and ϕ_{tt} are all zero (in addition in the absence of any technological change β_t is zero as well). Moreover if the δ_{it}'s and ϕ_{jt}'s are all zero then technological change, if any, is necessarily Hicks neutral.[16]

Alternatively we could have defined technological change using exponential factors of the type μ_i^t and λ_j^t. Except for β_t and ϕ_{tt}, this is equivalent to the use of time as an additional fixed input, as in Appelbaum and Harris (1974) and therefore requires the arbitrary normalization of t.

4.4 Stochastic Specification and Estimation Technique.

All estimations have been made by computing maximum likelihood estimators using an algorithm which allows for the model to be nonlinear in the parameters.[17] The logarithm of the likelihood function is maximized with respect to all parameters in the system and with respect to the covariance matrix Ω.

Assuming a joint normal distribution of the disturbances, we will use the likelihood ratio test to verify various hypotheses. The likelihood ratio is the ratio of the likelihood maximized under the null hypothesis to the likelihood maximized under the alternative hypothesis. Minus twice the logarithm of this ratio is asymptotically χ^2 distributed, the number of degrees of freedom being equal to the number of additional constraints required by the alternative hypothesis.

It is assumed that Π is an exact representation of the actual technology and that any deviation of the shares S's and V's from the profit maximizing (cost minimizing) shares are random. A vector of random disturbances $e_t' = (e_{1t}, \ldots e_{(I+J)t})$ such that $\sum_{i=1}^{I} e_{it} = 0$ and $\sum_{j=I+1}^{I+J} e_{jt} = 0$ is thus specified. The e's are assumed to be identically distributed normal random vectors with mean vector zero and covariance matrix Ω. The disturbances are thus allowed to be contemporaneously correlated (the covariance between the error term of a variable quantity share equation and the error term of a fixed quantity share equation may be non zero), but they are specified as temporally independent. Since both the S and the V shares sum up to one, Ω will be singular and two equations (one for the variable quantities one for the fixed quantities) may be dropped. The estimation however does not depend on which two equations are dropped.

5. EMPIRICAL RESULTS

5.1 Aggregate Model

The translog variable profit function was estimated with yearly data to describe the Canadian private economy, 1948-1972. The following variables were included in the model:

(i) variable quantities

1. Imports (M)
2. Exports (X)
3. Taxation on intermediate transactions (T)
4. Investment + final stock of inventories (I)
5. Consumption + Government purchases (C)

(ii) fixed quantities

1. Labour services (L)
2. Capital Services + initial stock of inventories (K)

All data are described and reported in the appendix. It may seem unusual to have included taxation on intermediate transactions as a variable input. This is however necessary from an accounting point of view since most intermediate transactions are taxed and thus represent a cost to the private business sector just like any other input. Similarly, the initial stock of inventories enter the productive process along with other inputs and their value is a cost to the industry. They are thus considered as a fixed input and for convenience were aggregated with capital. Final inventories were included since they are an output of the productive process and their value is a revenue to the industry. It is assumed that the quantity of final inventories is a choice variable and that their price is exogenous.

The model was initially estimated after disaggregating imports and exports into four classes each.[18] The results however turned out to be disappointing since the own price elasticities of several variable quantities (exports of raw materials, exports of finished products and, for some observations, imports of raw materials) had the wrong sign. In addition many elasticities were extremely unstable over time. This may be explained by the presence of very small shares: any deviation from the actual shares becomes relatively large and this affects directly the elasticities of transformation and the price elasticities. Finally the difficulty of obtaining convergence in a system of eleven simultaneous equations and the cost of this exercise would have made it very impractical to proceed with a model of this size. We decided therefore to use instead the seven good model (aggregated imports and exports) and, assuming separability of imports and exports, to estimate separately an import cost function and an export revenue function. It is thus assumed that optimization takes place in two steps. In the first step, the optimal import mix and the optimal export mix are determined as a function of the relative prices of the various import or export types. In the second step the optimal quantity of aggregate imports and aggregate exports are determined together with the optimal domestic output mix.

Estimating the seven good model without technical change (Model 1), we dropped the consumption and the capital equations and were left with the following system:

$$\begin{bmatrix} S_1 \\ S_2 \\ S_3 \\ S_4 \\ V_1 \end{bmatrix} = \begin{bmatrix} \alpha_1 & \gamma_{11} & \gamma_{12} & \gamma_{13} & \gamma_{14} & \gamma_{15} & \delta_{11} & \delta_{12} \\ \alpha_2 & \gamma_{12} & \gamma_{22} & \gamma_{23} & \gamma_{24} & \gamma_{25} & \delta_{21} & \delta_{22} \\ \alpha_3 & \gamma_{13} & \gamma_{23} & \gamma_{33} & \gamma_{34} & \gamma_{35} & \delta_{31} & \delta_{32} \\ \alpha_4 & \gamma_{14} & \gamma_{24} & \gamma_{34} & \gamma_{44} & \gamma_{45} & \delta_{41} & \delta_{42} \\ \beta_1 & \delta_{11} & \delta_{21} & \delta_{31} & \delta_{41} & \delta_{51} & \phi_{11} & \phi_{12} \end{bmatrix} \begin{bmatrix} 1 \\ \ln p_1 \\ \ln p_2 \\ \ln p_3 \\ \ln p_4 \\ \ln p_5 \\ \ln x_1 \\ \ln x_2 \end{bmatrix} + \begin{bmatrix} e_1 \\ e_2 \\ e_3 \\ e_4 \\ e_6 \end{bmatrix}$$

There are 40 parameters in the system. Since some of the γ's and δ's appear more than once they have to be restricted to a unique value which imposes 10 "symmetry" constraints. In addition, since the variable profit function is linear homogenous in prices by definition, the share equations are homogenous of degree zero in both prices and quantities. This leads to 10 additional "homogeneity" constraints, leaving us 20 parameters to estimate. In order to allow for the curvature constraints to be imposed at a later stage, the matrix $[\gamma]$ was written as:

$$\gamma = C - B$$

where C has been explained in section 4.3 above and B is of the form:

$$B = \begin{bmatrix} \alpha_1(\alpha_1-1) & \alpha_1\alpha_2 & \cdots & \alpha_1\alpha_I \\ \alpha_2\alpha_1 & \alpha_2(\alpha_2-1) & \cdots & \alpha_2\alpha_I \\ \vdots & \vdots & & \vdots \\ \alpha_I\alpha_1 & \alpha_I\alpha_2 & \cdots & \alpha_I(\alpha_I-1) \end{bmatrix}$$

while, making use of the Choleski decomposition, C is written as:

$$C = TDT' = \begin{bmatrix} 1 & 0 & \cdots & 0 \\ t_{21} & 1 & \cdots & 0 \\ \vdots & \vdots & & \vdots \\ t_{I1} & t_{I2} & & 1 \end{bmatrix} \begin{bmatrix} d_1 & 0 & \cdots & 0 \\ 0 & d_2 & \cdots & 0 \\ \vdots & \vdots & & \vdots \\ 0 & 0 & & d_I \end{bmatrix} \begin{bmatrix} 1 & t_{21} & \cdots & t_{I1} \\ 0 & 1 & \cdots & t_{I2} \\ \vdots & \vdots & & \vdots \\ 0 & 0 & & 1 \end{bmatrix}$$

This transformation does obviously not affect the number of free parameters in the system. Their values are reported in table I, column 1.

We next tested the homogeneity and the symmetry hypotheses. The model was therefore reestimated without imposing the corresponding restrictions. The statistics of the likelihood ratio tests are reported in table III. Either hypothesis, and the joint hypothesis as well, were rejected. Symmetry and homogeneity are however imposed in the remaining part of this thesis as a maintained hypothesis. It may appear surprising to use as a maintained hypothesis a hypothesis which has just been rejected by a test. However it is clear that both symmetry and homogeneity are part of our theoretical framework. Although symmetry could be dropped for instance if we merely wished to have estimates of ordinary price elasticities, it cannot if we want to model substitution possibilities. Moreover if symmetry were dropped, the demand and supply equations would not be integrable, i.e. there would not exist a primitive function from which they can be derived and the model would be based on nearly no theory. Clearly a better theory is desired and our tests call for it, but it would be pointless in the meantime to reject our theory in favour of no theory at all. Finally, it may also be argued that it may be desirable to force the world into an a priori theoretical model in order to partially overcome errors in variables as well as to make abstractions of many of the economy's complexities in order to be able to discuss anything at all.

Calculating the fitted shares, the various elasticities were computed and we found that the own elasticities of transformation of the investment and the consumption variables had consistently the wrong sign. The estimated profit function therefore could not be convex in prices, although it was concave in fixed quantities. This led us to make a non-parametric test on our data and it appeared that, with only very few exceptions, for any year t, our data were consistent with profit maximization for years preceeding t, but not for years subsequent to t.[19] One possible explanation for this would be the presence of technological progress. The model was therefore reestimated allowing the technology to shift over time (model 2). There were this time 25 free parameters, the values of which are reported in column 2 of table I. Table II summarizes the statistics for both model 1 and 2.

Model 1 allows for Hicks neutral technological change only (with the absence of technological change as a special case which cannot be tested for in our framework since β_t is not estimated.) Model 2 allows for technological change of a more general nature, but includes Hicks neutral technological change as a special case (i.e. model 1) which can be tested for. Testing for Hicks neutral technological change in this sense (i.e. the null hypothesis being the presence of unconstrained disembodied technological change), this alternative hypothesis was rejected.[20] In the remaining part of this thesis, the technology is allowed to shift over time in a way to affect the demand and supply functions.

Like model 1, model 2 fulfilled the monotonicity requirements. In addition all own elasticities had the right sign and therefore appeared economically meaningful. After computing the eigenvalues of the $[\gamma]$ and $[\phi]$ matrices, we found however that the variable profit function again was not convex in prices, although as before it was concave in fixed inputs. Recalling that convexity in prices is implied by the assumption of profit maximization, it was desirable to reestimate the model imposing convexity at the expansion point by the Choleski decomposition (model 2C). The values of the coefficients of model 2C are reported in the last column of table I. The statistics of the system are again summarized in table II. Monotonicity was fulfilled again for each observation, and the estimated variable profit function was now convex in prices for the years 1948, 1953-54, 1957-59 and 1961-62.[21] Tables V and VI contain the estimated elasticities of transformation and price elasticities. Finally the values of the technological parameters μ_i and λ_j were calculated. Since the share equations sum up to one, it is not possible to identify all μ's and λ's individually[22] and they are reported in table IV as differences with the coefficients for consumption goods and capital goods respectively.

It is interesting to compare our estimates of import and export price elasticities with those of other authors. Imports seem to be more price elastic (ε_{MM} from -2.7 in 1948 to -2.5 in 1972) than is often thought to be the case. Exports, though less price elastic than imports (ε_{XX} ranging from 2.4 in 1948 to 1.7 in 1972) nevertheless appear to be quite sensitive to price changes as well.[23] This result may be due partly to the fact that in our model domestic output is more disaggregated than in most other empirical studies, although imports and exports are still aggregated.

Looking at the cross elasticities, there is evidence that exports and investment goods are complements in production, meaning that an increase in the price of one output, all other prices and the fixed quantities held constant, leads to an increase in the production of the other output. On the other hand, export and consumption goods, as well as investment goods and consumption goods, are substitutes in production, i.e. an increase in the price of one output would yield a decrease in the production of the other output. Similarly, it appears that both exports and investment goods are intensive in imports, meaning that an increase in the price of either output, other prices and all fixed quantities being held constant, would lead to an increase (in absolute terms) in the quantity of imports. Alternatively, an increase in the price of imports would yield a decrease in the output of either exports or investment goods, but an increase in the output of consumption goods.

Turning towards fixed inputs, capital and labour are obviously substitutes for each other, but interestingly enough, the elasticity of substitution between labour and capital is very close to 1 and is extremely stable over time. Not surprisingly it appears that an increase in either labour or capital would lead to an increase of both consumption goods and investment goods. More surprising is the result that an increase in the capital stock would actually lead to an absolute fall in exports and in imports, or in other words, that either a fall in the price of imports or a raise in the price of exports would actually lower the rate of return to capital. The implication is that an increase in the quantity of labour would yield a more than proportional increase in either imports or exports.[24]

It is tempting to define the relative factor intensity of an output according to the relative effect of a change in the corresponding output price on factor rental prices. That is, variable quantity i will be said to be relatively labour (capital) intensive if an increase in the price of i would lead to a proportionally higher increase in the return to labour (capital) than in the return to capital (labour). By this definition, exports appear to be relatively labour intensive. Similarly imports appear to be relatively capital intensive. To a much smaller extent, consumption goods are found to be relatively capital intensive and investment goods appear to be relatively labour intensive. Recall that we found earlier that investment goods were also intensive in imported goods.

Concerning taxes on intermediate transactions, it appears that these taxes and imports are complements in production. Consumption goods are tax intensive for about half of the observed period; i.e., for 1948 and from 1962 on, but investment goods are not. Exports however appear to be tax intensive, which may seem somwhat surprising since the intermediate products entering the production of exports are exempted from taxes.[25] Taking our results at their face value, a decrease in the rate of taxation on intermediate transactions would lead to increased imports, and to a higher output of exports and consumption goods while output of investment goods would decrease. The rate of return to labour would increase but because of the relative capital intensity of taxation, the rate of return to capital would actually decrease.

With respect to the time coefficients, it appears that, on the input side, technological progress is relatively labour saving. On the output side, technological change is biased, relatively against the output of consumption goods, in favour of investment goods and against imports or exports. That is, compared to the production of consumption goods, technological change is investment good augmenting and imports appear to be more affected by technological progress than exports.

5.2 Import and Export Submodels.

Two separate submodels were estimated, one for imports (translog cost function) and one for exports (translog revenue function). Both imports and exports were disaggregated into four categories:

1. Live animals, food, feed, beverages and tobacco.
2. Crude materials, inedible.
3. Fabricated materials, inedible.
4. End products, inedible.

We have two separate system of four equations and for estimation purposes, the end product equation was dropped in each system. After imposing symmetry and homogeneity, there are 9 parameters to be estimated in either system. Like in the aggregate model, the [γ] matrices of both submodels were Choleski decomposed and our results are presented in table VII in terms of the element of the matrices T and D. We next tested both submodels for symmetry and homogeneity. The results of the tests are reported in table IX. As it turned out the homogeneity hypothesis could not be rejected forthe import submodel although it was for the export case. The symmetry hypothesis however was rejected in the import case, but could not be rejected in the export submodel. In the remaining estimations however, both symmetry and homogeneity will be imposed as part of our maintained hypotheses. From inspection of the own price elasticities of crude materials of both models, it appeared that the curvature conditions were satisfied in neither case. We attempted to allow for Hicks neutral technological change including the cost function (or the revenue function as the case may be), but this led to only little improvement.[26]

We then reestimated both submodels imposing negative and positive semi-definitness by constraining the sign of the elements of D (submodels MC and XC). The corresponding estimates of the parameters and the statistics of the two systems are reported in table VII and in table VIII respectively. Tables X and XI contain the estimated elasticities of transformation and substitution and the price elasticities corresponding to submodels MC and XC. All own elasticities have correct sign for each observation. Both the cost function and the revenue function satisfy the monotonicity conditions over the range of observed prices and quantities. Regarding the curvature conditions we found that the import subsystem is concave for the years 1948-1961, 1966 and 1972. The export submodel satisfies the convexity conditions for the years 1951-62, 1964, 1967-69 and 1972.

For both imports and exports, it appears that most components are substitutes for each others. In either case however, food and fabricated materials, as well as crude materials and end products, are complements in production. In addition, imports of food products and of crude materials are complements as well, but only from 1959 on. The own price elasticities for most components, especially for imports but also for exports of crude materials and of fabricated materials, are quite small. We have to remember, however, that those price elasticities are partial elasticities in the sense that they were estimated holding aggregate imports or exports constant, while in the aggregate model, imports and exports were allowed to vary.

6. CONCLUSIONS

It would appear that this alternative approach to the estimation of import and export functions, proposed in this thesis, is very promising. Not only are the import and export functions derived within a more general and more rigorous theoretical framework, but one obtains a much larger variety of information about imports and exports, namely how they relate to other aggregates of the economy. Thus we found that exports and investment goods were complements in production and that they were both import intensive. We also found that imports were capital intensive and exports labour intensive, to the point actually where an exogenous increase of the capital stock would result in a fall of both imports and exports. A fall in the price of imports would thus lead to an increase in the rental price of labour while it would lower in absolute terms the rental price of capital. The opposite would be true if the price of exports fell. The own price elasticities of imports and exports appear to be somewhat higher than it is usually thought. Disaggregating traded goods, we found evidence of complementarity in production, and this holds both for imports and for exports, between food products and fabricated materials on one hand, and between crude materials and end products on the other hand.

Factor augmenting technological change in a multi-input multi-output framework has been modelled. Hicks neutral technological change was included as a special case which was tested for and rejected. We found that technological change was labour saving and investment goods augmenting and that it affected exports less than the other outputs. The model also allows for the effects of changes in various government policy parameters to be readily calculated, e.g. changes in tariffs or intermediate taxes. Indirect taxes on intermediate products were explicitly dealt with, and we found that a decrease in these taxes would lead to an increase in both imports and exports.

It should be recalled that this model is essentially short-run in nature: optimization is assumed to be instantaneous and prices are taken as exogenous. The main assumption on which the model is based, i.e. perfect competition and profit maximization are of course very restrictive, but are very common both in empirical studies and in the pure theory of international trade.

The further use of subsystems would allow us to disaggregate the model even more and keep its theoretical consistency. A separability assumption is however required each time. In some cases this may not be desirable and it then would be preferable to disaggregate only one or two sectors at a time. Thus it would be of interest to disaggregate somewhat the labour sector or the capital sector and test whether all labour or capital components are separable from the remaining inputs and outputs of the economy, in which case they can be aggregated. If they are not separable, one could determine for instance which imports or exports if increased are most likely to lead to an increase in the demand for a particular type of labour or which capital component, if increased, may lead to a decrease in imports or an increase in exports. In the non separable case, aggregation could then only be carried out without errors if Hicks' Aggregation Theorem applied.

The construction of price and quantity components of Canadian foreign trade has revealed some of the difficulties of building time series on a consistent classification basis. We nevertheless believe that the series which were compiled in this study represent actual trends in Canadian external trade. The price series we constructed at the section level for imports and exports appear to be the only subaggregate series of Canadian foreign trade covering the entire post war period. At a time when there is in Canada a concerted effort to construct time series for various domestic variables, we hope that this study will fill a gap and will be a useful data base for further research in international trade and the testing of neoclassical production theory.

Table I.

Parameter estimates of translog variable profit function for aggregate Canadian private economy 1948-1972 (standard error in parantheses).

Parameter	Model 1	Model 2	Model 2C
α_1	-0.161 (0.003)	-0.154 (0.003)	-0.154 (0.003)
α_2	0.160 (0.004)	0.143 (0.004)	0.144 (0.004)
α_3	-0.041 (0.001)	-0.039 (0.001)	-0.039 (0.001)
α_4	0.342 (0.006)	0.351 (0.004)	0.349 (0.005)
β_1	0.576 (0.003)	0.563 (0.003)	0.565 (0.004)
t_{21}	-0.543 (0.157)	-0.682 (0.164)	-0.774 (0.178)
t_{31}	0.084 (0.037)	0.019 (0.037)	0.019 (0.047)
t_{32}	-1.504(19.756)	5.377(48.657)	-0.390 (0.537)
t_{41}	-0.779 (0.181)	-0.519 (0.147)	-0.493 (0.183)
t_{42}	19.871(270.701)	-5.683(47.231)	0.509 (1.440)
t_{43}	17.308(534.027)	-0.865 (1.360)	2.533(11.270)
d_1	0.454 (0.070)	0.409 (0.066)	0.652 (0.056)
d_2	0.009 (0.121)	-0.013 (0.115)	0.338 (0.195)
d_3	0.015 (0.270)	0.381 (3.359)	0.119 (0.143)
d_4	8.985(255.395)	0.059 (0.126)	-0.00002(25058)
δ_{11}	0.011 (0.022)	-0.132 (0.040)	-0.121 (0.048)
δ_{21}	-0.078 (0.034)	0.228 (0.056)	0.174 (0.070)
δ_{31}	-0.008 (0.006)	-0.057 (0.011)	-0.063 (0.016)
δ_{41}	0.076 (0.038)	-0.040 (0.055)	0.016 (0.083

Table I, continued.

ϕ_{11}	-0.120 (0.015)	0.058 (0.042)	0.013 (2.376)
ϕ_{1t}	-	-0.005 (0.001)	-0.005 (0.001)
ϕ_{2t}	-	0.008 (0.002)	0.007 (0.002)
ϕ_{3t}	-	-0.002 (0.0003)	-0.002 (0.0005)
ϕ_{4t}	-	-0.002 (0.002)	-0.0003(0.003)
ϕ_{6t}	-	0.005 (0.001)	0.004 (0.002)

Note: for model 2C, the values corresponding to d_1, d_2, d_3 and d_4 are estimates for $\pm\sqrt{|d_1|}$.

Table II.

Statistics of the aggregate model.

Equation		Model 1 R^2	Model 1 DW	Model 2 R^2	Model 2 DW	Model 2C R^2	Model 2C DW
Imports	(M)	0.536	1.608	0.648	1.475	0.642	1.462
Exports	(X)	0.408	0.324	0.810	1.398	0.761	1.089
Ind. Taxation	(T)	0.399	0.936	0.618	1.235	0.126	0.738
Investment	(I)	-0.199	0.913	0.775	0.995	0.606	0.618
Labour	(L)	0.833	0.667	0.921	1.535	0.868	0.918

Table III.

Test statistics, aggregate Canadian private economy 1948-1972.

Test	Restrictions	Critical Value (0.01)	χ^2
Homogeneity	10	23.21	115.714
Symmetry (conditional on homog.)	10	23.21	73.986
Homogeneity & Symmetry	20	37.57	189.700
Technological change	5	15.09	91.658
Tech. change, convexity imposed	5	15.09	74.462

Table IV.

Rates of exponential technological change, aggregate Canadian private economy 1948-1972 (Model 2C).

$\mu_M - \mu_C = -0.072$	$\lambda_L - \lambda_K = 0.182$
$\mu_X - \mu_C = -0.132$	
$\mu_T - \mu_C = -0.291$	
$\mu_I - \mu_C = 0.0033$	

Table V.

Elasticities of transformation, complementarity and intensity for selected years 1948-1972, aggregate Canadian private economy (model 2C)

Elasticity	1948	1955	1961	1967	1972
Θ_{MM}	17.230	17.226	17.811	14.035	12.781
Θ_{MX}	13.940	14.132	14.794	10.419	9.116
Θ_{MT}	1.246	1.283	1.296	1.229	1.203
Θ_{MI}	3.533	3.722	3.885	3.420	3.316
Θ_{MC}	-1.036	-0.967	-0.975	-0.710	-0.590
Θ_{XX}	16.158	16.715	17.786	10.659	8.744
Θ_{XT}	7.456	8.516	8.928	6.746	6.009
Θ_{XI}	3.910	4.174	4.382	3.665	3.500

Table V, continued.

Θ_{XC}	-2.105	-2.045	-2.074	-1.500	-1.278
Θ_{TT}	18.336	20.163	20.516	19.173	18.476
Θ_{TI}	-0.293	-0.594	-0.696	-0.511	-0.462
Θ_{TC}	0.058	-0.044	-0.052	0.033	0.090
Θ_{II}	1.413	1.683	1.840	1.768	1.860
Θ_{IC}	-0.890	-0.962	-0.999	-0.997	-1.021
Θ_{CC}	0.753	0.720	0.705	0.718	0.711
Θ_{LL}	-0.991	-0.850	-0.772	-0.674	-0.607
Θ_{LK}	1.001	1.001	1.001	1.001	1.001
Θ_{KK}	-1.011	-1.178	-1.297	-1.485	-1.649
ψ_{ML}	2.528	2.420	2.390	2.120	2.008
ψ_{MK}	-0.544	-0.672	-0.802	-0.662	-0.661
ψ_{XL}	3.306	3.175	3.141	2.620	2.429
ψ_{XK}	-1.329	-1.561	-1.775	-1.404	-1.355
ψ_{TL}	3.692	3.870	3.822	3.413	3.198
ψ_{TK}	-1.720	-2.380	-2.658	-2.581	-2.621
ψ_{IL}	1.082	1.082	1.081	1.075	1.074
ψ_{IK}	0.917	0.904	0.895	0.888	0.878
ψ_{CL}	0.981	0.983	0.984	0.985	0.986
ψ_{CK}	1.019	1.020	1.020	1.022	1.024

Table VI.

ε, η, ξ and ρ elasticities for selected years 1948-1972, aggregate Canadian private economy (model 2C).

Elasticity	1948	1955	1961	1967	1972
ε_{MM}	-2.719	-2.719	-2.750	-2.542	-2.469
ε_{MX}	2.093	2.091	2.130	1.873	1.783
ε_{MT}	-0.058	-0.052	-0.051	-0.053	-0.055
ε_{MI}	1.373	1.346	1.355	1.212	1.151
ε_{MC}	-0.689	-0.666	-0.683	-0.490	-0.411
ε_{XM}	-2.200	-2.231	-2.284	-1.887	-1.761
ε_{XX}	2.426	2.473	2.561	1.916	1.710
ε_{XT}	-0.345	-0.343	-0.351	-0.293	-0.275
ε_{XI}	1.519	1.509	1.528	1.299	1.215
ε_{XC}	-1.401	-1.408	-1.454	-1.035	-0.890
ε_{TM}	-0.197	-0.202	-0.200	-0.223	-0.232
ε_{TX}	1.120	1.260	1.285	1.213	1.175
ε_{TT}	-0.848	-0.813	-0.806	-0.832	-0.845
ε_{TI}	-0.114	-0.215	-0.243	-0.181	-0.161
ε_{TC}	0.039	-0.030	-0.037	0.023	0.063
ε_{IM}	-0.558	-0.587	-0.600	-0.619	-0.641
ε_{IX}	0.587	0.618	0.631	0.659	0.685
ε_{IT}	0.014	0.024	0.027	0.022	0.021
ε_{II}	0.549	0.609	0.642	0.627	0.646
ε_{IC}	-0.592	-0.663	-0.700	-0.688	-0.711
ε_{CM}	0.163	0.153	0.151	0.129	0.114
ε_{CX}	-0.316	-0.303	-0.299	-0.270	-0.250

TABLE VI, continued

ε_{CT}	-0.003	0.002	0.002	-0.001	-0.004
ε_{CI}	-0.346	-0.348	-0.348	-0.353	-0.355
ε_{CC}	0.501	0.496	0.494	0.496	0.495
η_{LL}	-0.498	-0.460	-0.436	-0.403	-0.378
η_{LK}	0.498	0.460	0.436	0.403	0.378
η_{KL}	0.503	0.541	0.565	0.598	0.623
η_{KK}	-0.503	-0.541	-0.565	-0.598	-0.623
ξ_{ML}	1.270	1.309	1.349	1.266	1.250
ξ_{MK}	-0.270	-0.309	-0.349	-0.266	-0.250
ξ_{XL}	1.661	1.717	1.773	1.565	1.512
ξ_{XK}	-0.661	-0.717	-0.773	-0.565	-0.512
ξ_{TL}	1.856	2.093	2.158	2.039	1.990
ξ_{TK}	-0.856	-1.093	-1.158	-1.039	-0.990
ξ_{IL}	0.544	0.585	0.610	0.642	0.668
ξ_{IK}	0.456	0.415	0.390	0.358	0.332
ξ_{CL}	0.493	0.532	0.556	0.588	0.613
ξ_{CK}	0.507	0.468	0.444	0.412	0.387
ρ_{LM}	-0.399	-0.382	-0.369	-0.384	-0.388
ρ_{LX}	0.496	0.470	0.452	0.471	0.475
ρ_{LT}	-0.171	-0.156	-0.150	-0.148	-0.146
ρ_{LI}	0.420	0.391	0.377	0.381	0.373
ρ_{LC}	0.653	0.677	0.690	0.680	0.686
ρ_{KM}	0.086	0.106	0.124	0.120	0.128
ρ_{KX}	-0.200	-0.231	-0.256	-0.252	-0.265
ρ_{KT}	0.080	0.096	0.104	0.112	0.120
ρ_{KI}	0.356	0.327	0.312	0.315	0.305
ρ_{KC}	0.678	0.702	0.715	0.706	0.713

Table VII.

Parameter estimates of translog cost and revenue functions for Canadian foreign trade 1948-1972 (asymptotic standard error in parantheses).

Parameter	Model MC		Model XC	
α_1	0.094	(0.004)	0.181	(0.012)
α_2	0.106	(0.011)	0.206	(0.010)
α_3	0.236	(0.010)	0.430	(0.020)
t_{21}	0.031	(2.269)	-0.662	(0.194)
t_{31}	1.061	(4.080)	0.480	(0.263)
t_{32}	-3.507	(41.130)	-3.582	(36.819)
$\pm\sqrt{d_1}$	0.151	(0.174)	-0.538	(0.056)
$\pm\sqrt{d_2}$	-0.086	(0.446)	-0.106	(0.573)
$\pm\sqrt{d_3}$	0.009	(72.129)	0.031	(24.387)

Table VIII.

Statistics of import and export submodels.

Equation		Imports		Exports	
		R^2	DW	R^2	DW
Food, etc.	(1)	0.207	0.263	0.720	0.647
Crude materials	(2)	0.140	0.093	0.598	0.248
Fabricated materials	(3)	-0.721	0.069	0.221	0.255

Table IX.

Test statistics, Canadian foreign trade 1948-1972.

Test	Restrictions	Critical Value (0.01)	χ^2
Imports			
Homogeneity	3	11.34	9.304
Symmetry (conditional on homog.)	3	11.34	13.100
Homogeneity & Symmetry	6	16.81	22.404
Exports			
Homogeneity	3	11.34	16.704
Symmetry (conditional on homog.)	3	11.34	11.456
Homogeneity & Symmetry	6	16.81	28.160

Table X.

Elasticities of substitution and transformation for selected years 1948-1972, Canadian foreign trade.

Elasticity	1948	1955	1961	1967	1972
$M^{\sigma}11$	-2.876	-2.822	-2.575	-2.497	-2.719
$M^{\sigma}12$	0.216	0.145	-0.070	-0.104	-0.011
$M^{\sigma}13$	-0.915	-0.969	-1.089	-1.123	-1.037
$M^{\sigma}14$	0.906	0.905	0.899	0.897	0.903
$M^{\sigma}22$	-1.489	-1.306	-0.659	-0.594	-0.719
$M^{\sigma}23$	1.004	1.004	1.005	1.005	1.005
$M^{\sigma}24$	-0.114	-0.158	-0.285	-0.294	-0.273
$M^{\sigma}33$	-2.153	-2.151	-2.092	-2.081	-2.134
$M^{\sigma}34$	0.857	0.860	0.868	0.869	0.865
$M^{\sigma}44$	-0.516	-0.495	-0.460	-0.456	-0.461
$X^{\Theta}11$	1.969	5.191	8.805	7.066	9.581
$X^{\Theta}12$	-5.662	-5.143	-5.120	-4.496	-5.288
$X^{\Theta}13$	1.348	1.540	1.780	1.716	1.766
$X^{\Theta}14$	-20.526	-9.896	-7.140	-7.261	-8.388
$X^{\Theta}22$	19.417	5.976	3.240	3.090	3.165
$X^{\Theta}23$	-3.032	-1.667	-1.486	-1.459	-1.340
$X^{\Theta}24$	38.665	9.122	4.917	5.284	5.325
$X^{\Theta}33$	0.742	0.824	1.140	1.154	1.013
$X^{\Theta}34$	-13.851	-4.394	-2.770	-3.214	-2.982
$X^{\Theta}44$	266.995	26.522	8.047	10.389	10.425

Table XI.

Price elasticities for selected years 1948–1972, Canadian foreign trade.

Elasticity	1948	1955	1961	1967	1972
$M^{\varepsilon}11$	-0.305	-0.291	-0.242	-0.230	-0.268
$M^{\varepsilon}12$	0.028	0.018	-0.007	-0.011	-0.001
$M^{\varepsilon}13$	-0.209	-0.222	-0.257	-0.266	-0.240
$M^{\varepsilon}14$	0.486	0.495	0.507	0.507	0.509
$M^{\varepsilon}21$	0.023	0.015	-0.007	-0.010	-0.001
$M^{\varepsilon}22$	-0.191	-0.158	-0.070	-0.062	-0.077
$M^{\varepsilon}23$	0.230	0.230	0.237	0.238	0.232
$M^{\varepsilon}24$	-0.061	-0.086	-0.161	-0.166	-0.154
$M^{\varepsilon}31$	-0.097	-0.100	-0.103	-0.103	-0.102
$M^{\varepsilon}32$	0.129	0.122	0.107	0.105	0.108
$M^{\varepsilon}33$	-0.492	-0.492	-0.494	-0.494	-0.493
$M^{\varepsilon}34$	0.460	0.470	0.490	0.492	0.487
$M^{\varepsilon}41$	0.096	0.093	0.085	0.083	0.089
$M^{\varepsilon}42$	-0.015	-0.019	-0.030	-0.031	-0.029
$M^{\varepsilon}43$	0.196	0.197	0.205	0.206	0.200
$M^{\varepsilon}44$	-0.277	-0.271	-0.259	-0.258	-0.260
$X^{\varepsilon}11$	0.652	1.168	1.595	1.402	1.676
$X^{\varepsilon}12$	-0.587	-0.850	-1.055	-0.942	-1.099
$X^{\varepsilon}13$	0.711	0.770	0.765	0.734	0.800
$X^{\varepsilon}14$	-0.776	-1.088	-1.305	-1.194	-1.377
$X^{\varepsilon}21$	-1.875	-1.157	-0.928	-0.892	-0.925

Table XI, continued.

X^{ε}_{22}	2.012	0.988	0.668	0.647	0.658
X^{ε}_{23}	-1.599	-0.833	-0.639	-0.624	-0.607
X^{ε}_{24}	1.462	1.003	0.899	0.869	0.874
X^{ε}_{31}	0.446	0.347	0.322	0.340	0.309
X^{ε}_{32}	-0.314	0.276	-0.306	-0.306	-0.278
X^{ε}_{33}	0.392	0.412	0.490	0.494	0.459
X^{ε}_{34}	-0.524	-0.483	-0.506	-0.528	-0.490
X^{ε}_{41}	-6.796	-2.227	-1.293	-1.441	-1.467
X^{ε}_{42}	4.006	1.508	1.014	1.107	1.107
X^{ε}_{43}	-7.306	-2.196	-1.191	-1.374	-1.351
X^{ε}_{44}	10.096	2.915	1.471	1.708	1.711

FOOTNOTES

1. These variables vary from one author to another. Prachowny (1969) for instance uses in some trade equations such variables as credit conditions, official international reserves, direct foreign investments, world exports, etc. Ball and Marwah (1962) modified the basic model by adding exogenous variables such as the non wage to wage income ratio or the stocks of non ferrous metals. The use of seasonal dummy variables is also quite frequent, see for instance Rhomberg (1964).
2. See for instance Liu (1954), Prais (1962), or Leamer and Stern (1970).
3. See Allen (1938), p. 508.
4. Kaliski's critique will be discussed algebraically below.
5. Hicks (1946) pp. 308-311.
6. This treatment of imports is analogous to the National Accounting procedure.
7. Although this assumption is very common in the literature, Appelbaum and Kohli (1975) have shown that this does not seem to hold for Canada's exports in her trade with the United States.
8. The assumptions on the production possibility set vary from author to author. See for instance Diewert (1973) or Lau (1974a).
9. The elasticity of transformation can be written as:

$$\Theta_{ih} = \frac{\frac{\partial y_i}{\partial p_h} \frac{p_h}{y_i}}{\frac{y_h \; p_h}{\Pi}} = \frac{\frac{\partial y_h}{\partial p_i} \frac{p_i}{y_h}}{\frac{y_i \; p_i}{\Pi}} = \frac{\varepsilon_{ih}}{S_h} = \frac{\varepsilon_{hi}}{S_i}$$

and similarly for the other elasticities.

10. For a discussion of separability of functions, see Berndt and Christensen (1973) and Blackorby, Primont and Russell (1974).

11. Indeed, the γ_{ih}'s (and ϕ_{jk}'s), $i \neq h$, could not be identified individually. One can only estimate the sums $(\gamma_{ih} + \gamma_{hi})$ and imposing the equality $\gamma_{ih} = \gamma_{hi}$ does not lead therefore to any loss of generality.

12. The input data have been constructed such that $w'x = \Pi$. This restricts the production possibility set to a cone.

13. Monotonicity in prices requires:

$$(\text{sign } y_i) \; \frac{\partial \Pi(p^*;x^*)}{\partial p_i} \geq 0, \quad i = 1, \ldots I$$

Since in the translog case:

$$S_i = \frac{\partial \ln \Pi(p^*;x^*)}{\partial \ln p_i} = \frac{\partial \Pi(p^*;x^*)}{\partial p_i} \; \frac{p_i}{\Pi}$$

and since $p_i y \geq 0$, $\Pi \geq 0$, the monotonicity condition can be written as:

$$(\text{sign } y_i) \; S_i \geq 0 \quad i = 1, \ldots I$$

and similarly for the fixed quantities.

14. With the translog functional form, the time variable is t in Jorgenson's treatment, but is lnt in Appelbaum and Harris. In the first case t is normalized to zero for the base observation and the estimates of the coefficient of all variables except t are independent of the normalization. In the second case t is normalized to one for the base observation. The estimates of all the coefficients are however not independent of the normalization which is chosen. This is so, since by the normalization of t one chooses arbitrarily

the initial value of the time variable which could be regarded as the stock of knowledge. In the first case, this is irrelevant since whatever the normalization is, it only affects the steps of an arithmetic progression, i.e. the slope of a straight line.

15. See Jorgenson (1974).

16. We can write the expressions for the δ_{it}'s and ϕ_{jt}'s using matrix notation as follows:

$$\hat{\delta}_t = \hat{\gamma}\hat{\mu} + \hat{\delta}\hat{\lambda}$$

$$\hat{\phi}_t = \hat{\delta}'\hat{\mu} + \hat{\phi}\hat{\phi}\hat{\lambda}\hat{\lambda}$$

where $\hat{\delta}_t = (\delta_{it}, \delta_{2t}, \ldots \delta_{I-1,t})'$

$$\hat{\phi}_t = (\phi_{it}, \phi_{2t}, \ldots \phi_{J-1,t})'$$

$$\hat{\mu} = (\mu_1 - \mu_I, \mu_2 - \mu_I, \ldots \mu_{I-1} - \mu_I)'$$

$$\hat{\lambda} = (\lambda_1 - \lambda_J, \lambda_2 - \lambda_J, \ldots \lambda_{J-1} - \lambda_J)'$$

and $\hat{\gamma}$, $\hat{\delta}$, $\hat{\delta}'$ and $\hat{\phi}$ are respectively the γ, δ, δ' and ϕ matrices with the last row and last column deleted. This can be rewritten as:

$$\begin{bmatrix} \hat{\delta}_t \\ \hat{\phi}_t \end{bmatrix} = \begin{bmatrix} \hat{\gamma} & \hat{\delta} \\ \hat{\delta}' & \hat{\phi} \end{bmatrix} \begin{bmatrix} \hat{\mu} \\ \hat{\lambda} \end{bmatrix}$$

This is a system of I + J - 2 equations with the same number of variables. In addition all equations are independent, i.e.

$\begin{bmatrix} \hat{\gamma} & \hat{\delta} \\ \hat{\delta}' & \hat{\phi} \end{bmatrix}$ is nonsingular.

The only solution to the homogenous system

$$\bar{0} = \begin{bmatrix} \hat{\gamma} & \hat{\delta} \\ \hat{\delta}' & \hat{\phi} \end{bmatrix} \begin{bmatrix} \hat{\mu} \\ \hat{\lambda} \end{bmatrix}$$

is therefore the trivial solution

$(\hat{\mu}', \hat{\lambda}') = \bar{0}$ QED

17. See Berndt, Hall, Hall and Hausman (1974).

18. For this particular estimation, we used the Chapman and Fair (1972) full information maximum likelihood programme based on Chow and Fair (1971).

19. See Afriat (1972) and Hanoch and Rothschild (1972). The test was made holding capital only fixed. It appeared that given the capital input and the price vector of period t, the output mix of period t indeed yielded a larger variable profit than any output mix of periods before t, but the reverse was in general true for periods subsequent to the reverse was in general true fo subsequent to t.

20. The same test was also made after having imposed convexity in prices. See table III.

21. We also attempted to obtain convexity over the entire range of observed prices and quantities by imposing one or several Choleski values to be greater or equal to some constant. This is equivalent to the imposition of a convexity constraint at the expansion point. Although we obtained the desired result, this procedure may seem somewhat arbitrary. In addition the goodness of fit decreased substantially, resulting in large fluctuations in the estimated elasticities.

22. Recall that one μ_i had to be normalized anyway and also that β_t has not been estimated.

23. Several authors found a (total) price elasticity of imports in the neighbourhood of minus one; see for instance Kemp (1962) and Rhomberg (1964). For the United States, Burgess (1973) found a partial price elasticity of an average of -1.9. Prewar estimates were in general much less than one in absolute value; see for instance Leamer and Stern (1970).

24. This type of phenomenon is well known in the growth literature. In a two factor two good model, this could be pictured by an outward twist of the production possibility frontier as the endowment of one factor is increased, such that at unchanged commodity prices, the output intensive in the other factor actually decreases.

25. This result is surprising at first but may be explained by the large number of variables and by the even larger number of possible interactions present in the model and which make it hardly possible to have any a priori expectations on the sign of the effect of a tax on one of many outputs. For instance, taxes, like imports, appear to be relatively capital intensive, to the point actually where a increase in the stock of capital leads to an absolute decrease in the quantity of both variable inputs; we can also recall that such an increase in the capital stock would decrease output of exports (remember also that exports were imports intensive) and the fact that exports turn out to be tax intensive may then be very incidental, i.e. the fact that taxes and imports are complements or the fact that taxes are relatively capital

intensive may outweigh the fact that intermediate goods entering the production of exports are not taxed.

REFERENCES

Afriat, S.N., 1972, "Efficiency Estimation of Production Function", International Economic Review, 13, 568-598.

Allen, R. G. D., 1938, Mathematical Analysis for Economists, London: Macmillan.

Appelbaum, E. and R. G. Harris, 1974, "Estimating Technology in an Intertemporal Framework: A Neo-Austrian Approach", Working Paper, Department of Economics, University of British Columbia.

Appelbaum, E. and U. R. Kohli, 1975, "Canada-US Trade: Tests for the Small Open Economy Hypothesis", Working Paper, Department of Economics, University of British Columbia.

Ball, R. J. and K. Marwah, 1962, "The US Demand for Imports, 1948-1958", Review of Economics and Statistics, 44, November, 395-401.

Bank of Canada, Bank of Canada Review, various issues.

Berndt, E. R. and L. R. Christensen, 1973, "The Internal Structure of Functional Relationships: Separability, Substitution and Aggregation", Review of Economic Studies, 40, July, 403-410.

Berndt, E. R., B. H. Hall, R. E. Hall and J. A. Hausman, 1974, "Estimation and Inference in Nonlinear Structural Models, Annals of Economic and Social Measurement, 3/4, 653-665.

Blackorby, C., D. Primont and R. R. Russell (1974) "The Theoretical and Empirical Implications of Budgeting Decentralization and Aggregation", Discussion Paper 74-5, Department of Economics, University of California at San Diego.

Burgess, D. F., 1974a, "A Cost Minimization Approach to Import Demand Equations", Review of Economics and Statistics, 56, May, 225-234.

Burgess, D. F., 1974b, "Production Theory and the Derived Demand for Imports", Journal of International Economics, 4, 103-117.

Chapman, D. R. and R. C. Fair, 1972, "Full-Information Maximum Likelihood Program: User's Guide", Research Memorandum no. 137, Econometric Research Program, Princeton University.

Cheng, H. S., 1959, "A Collection of Statistical Estimates of Elasticities and Propensities in International Trade", IMF Staff Papers, 7, August, 107-158.

Chow, G. C. and R. C. Fair, 1971, "Maximum Likelihood Estimation of Linear Equation Systems with Autoregressive Residuals", Research Memorandum no. 118, Econometric Research Program, Princeton University.

Christensen, L. R., D. W. Jorgenson and L. J. Lau, 1971, "Conjugate Duality and the Transcendental Logarithmic Production Function", Econometrica, 39, 255-256.

Christensen, L. R., D. W. Jorgenson and L. J. Lau, 1973, "Transcendental Logarithmic Production Frontiers", Review of Economics and Statistics, 55, 28-45.

Danielson, R. S., 1973, "Input and Output Data for the Canadian Agricultural Sector, 1926-1970", B.A. Thesis, University of British Columbia.

Diewert, W. E. 1972, "Walras' Theory of Capital Formation and the Existence of a Temporary Equilibrium", Discussion Paper 76, Department of Economics, University of British Columbia.

Diewert, W. E., 1973, "Functional Forms for Profit and Transformation Functions", Journal of Economic Theory, 6, 284-316.

Diewert, W. E., 1974a, "Applications of Duality Theory", in Frontiers of Quantitative Economics, Volume II, ed. M. D. Intriligator and D. A. Kendrick, Amsterdam: North-Holland.

Diewert, W. E., 1974b, "Homogenous Weak Separability and Exact Index Numbers", Technical Report no. 122, Institute for Mathematical Studies in the Social Sciences, Stanford.

Diewert, W. E., 1975, "Annual Employment, Industry by Occupation, in Canada 1926-1974 on an Employment Survey Basis and Estimates of Occupational Earnings", Department of Manpower and Immigration, Ottawa.

Dominion Bureau of Statistics, 1950, "Export and Import Price Indexes by Months", D.B.S. Reference Papers.

Fisher, I., 1922, The Making of Index Numbers, Boston: Houghton-Mifflin.

Goldberger, A. S., 1967, "Functional Form and Utility: A Review of Consumer Demand Theory", Social Systems Research Institute, University of Wisconsin.

Gorman, W. M., 1968, "Measuring the Quantities of Fixed Factors", in Value, Capital and Growth: Papers in Honour of Sir John Hicks, ed. J. V. Wolfe, Chicago: Aldine Publishing Co.

Hanoch, G. and M. Rothschild, 1972, "Testing the Assumptions of Production Theory: A Nonparametric Approach", Journal of Political Economy, 80, 256-275.

Harberger, A. C., 1953, "A Structural Approach to the Problem of Import Demand", American Economic Review, Papers and Proceedings, 43, 148-160.

Harberger, A. C., 1957, "Some Evidence on the International Price Mechanism", Journal of Political Economy, 65, 506-521.

Hotelling, H., 1932, "Edgeworth's Taxation Paradox and the Nature of Demand and Supply Functions", Journal of Political Economy, 40, 577-616.

Houthakker, H. S. and S. D. Magee, 1969, "Income and Price Elasticities in World Trade", Review of Economics and Statistics, 51, 111-115.

Jorgenson, D. W., 1973, "Convexity", Unpublished memorandum.

Jorgenson, D. W., 1974, "Production in the Inter-Industry Model", unpublished memorandum.

Junz, H. B. and R. R. Rhomberg, 1973, "Price Competitiveness in Export Trade Among Industrial Countries", American Economic Review, Papers and Proceedings, 63, 412-418.

Kaliski, S. F., 1958, "A Comment on Dr. Zelder's Estimates", Manchester School, 26, 241-246.

Kemp, M. C., 1962, The Demand for Canadian Imports, 1926-1955, Toronto: University of Toronto Press.

Lau, L. J., 1974a, "Applications of Duality Theory: A Comment", in Frontiers of Quantitative Economics, Volume II, ed. M.D. Intriligator and D. A. Kendrick, Amsterdam: North-Holland.

Lau, L. J., 1974b, "Econometrics of Monotonicity, Convexity and Quasi-convexity", Technical Report no. 123, Institute for Mathematical Studies in the Social Sciences, Stanford.

Leamer, E. E. and R. M. Stern, 1970, Quantitative International Economics, Boston: Allyn and Bacon.

Liu, T. C., 1954, "The Elasticity of U.S. Import Demand: A Theoretical and Empirical Reappraisal", IMF Staff Papers, 3, 416-441.

Machlup, F., 1950, "Elasticity Pessimism in International Trade", Economia Internationale, 3, 118.

Morrissett, I., 1953, "Some Recent Uses of Elasticity of Substitution -- A Survey", Econometrica, 21, 41-62.

Neisser, H., 1958, " 'Comment' on 'Some Evidence on the International Price Mechanism' ", Review of Economics and Statistics, 40, 129-139.

Orcutt, G. H., 1950, "Measurement of Price Elasticities in International Trade", Review of Economics and Statistics, 32, 117-132.

Prachowny, M. F. J., 1969, A Structural Model of the US Balance of Payments, Amsterdam: North-Holland.

Prais, S. J., 1962, "Econometric Research in International Trade: A Review", Kyklos, 15, 560-579.

Rhomberg, R. R., 1964, "A Model of the Canadian Economy under Fixed and Fluctuating Exchange Rates", Journal of Political Economy, 72, 1-31.

Samuelson, P. A., 1953-54, "Prices of Factors and Goods in General Equilibrium", Review of Economic Studies, 21, 1-20.

Shephard, R. W., 1953, Cost and Production Functions, Princeton: Princeton University Press.

Slater, D. W., 1957, Canada's Imports, Ottawa: Queen's Printer.

Statistics Canada, Review of Foreign Trade, various issues.

Statistics Canada, Trade of Canada, Volume I: Summary, Volume II: Exports Volume III: Imports, various issues.

Statistics Canada, System of National Accounts - National Income and Expenditure Accounts, various issues.

Theil, H., 1965, "The Information Approach to Demand Analysis", Econometrica, 33, 67-87.

Uzawa, H., 1962, "Production Functions with Constant Elasticities of Substitution", Review of Economic Studies, 29, 291-299.

Woodland, A. D., 1972, "The Construction of Price and Quantity Components of Inputs for Canadian Industries, 1927-1969", Department of Manpower and Immigration, Ottawa.

Working, E. J., 1927, "What Do Statistical 'Demand Curves' Show?", Quarterly Journal of Economics, 41, 212-235.

Zelder, R. E., 1958, "Estimates of Elasticities of Demand for Exports of the United Kingdom and the United States, 1921-1938", Manchester School, 26, 33-47.

APPENDIX

1. Data Description: Domestic Variables

All data are yearly data for 1948 to 1972 and are reported in Table A.I. The labour and capital data were calculated as Divisia quantity indices of the disaggregated series contained in Woodland (1972) and Diewert (1975).

On the variable quantity side, the data for consumption, investment and government purchases were derived from the National Accounts. Investment includes new residential construction, new non-residential construction and new machinery and equipment. Government expenditures were defined as sales from business to government and were aggregated with consumption.

Inventories were considered to be a fixed input to the technology at the beginning of the period and a variable output at the end of the period (see Diewert (1972), Section 6: "Producer Behaviour When Depreciation Rates are Variable").

The cost associated with the initial stock of inventories is calculated as:

$$C_t = p_t q_{t-1}$$

where p_t is the current price of inventories and q_{t-1} the quantity of inventories at the end of period t-1. The revenue correspond to the output of inventories is:

$$R_t = q_t \frac{p_t}{1 + r_t}$$

where r_t is an exogenous interest rate. Thus when at the beginning of the period firms decide upon the volume of their final inventories, they discount the current price of inventories.

The inventory data include both farm and business inventory series and were computed by Denny (1974); farm inventories include grain in commercial channels. The interest rate we used to discount farm inventories is the price of farm mortgage rate contained in Danielson (1973), while for business inventories we used the Government of Canada 1 to 3 year bond yield.

Intermediate transactions enter the model since they are subject to taxation and therefore imply a net cost to the business sector. The revenue of the selling firm is:

$$R = p\ q$$

while for the purchasing firm the cost would be:

$$C = p(1 + \tau)\ q$$

where τ is the tax rate applying to transactions of intermediate goods. The net cost to the business sector is therefore:

$$C - R = p\ \tau\ q = T,$$

T being the tax receipts from intermediate transactions, and the price corresponding to cost T can then be calculated as:

$$p\ \tau = \frac{T}{q}\ .$$

The cost of intermediate transactions was calculated as the total of federal sales taxes, excise taxes and excise duties, all figures being taken from the National Accounts. The quantity of wholesale trade was obtained by deflating the volume of wholesale trade by the wholesale price index for fabricated materials and end products as published by Statistics Canada. The volume itself has been calculated net of sales of drugs, food, coal, farm machinery, industrial equipment and supplies, and newsprint.

2. Construction of Price and Quantity Components of Canadian Foreign Trade: 1948 to 1972

We discuss in this section the construction of disaggregated price and quantity series of Canadian imports and exports, as well as the corresponding series of import duties and re-exports. We further describe the construction of subaggregate series according to a classification of imports and exports into four components. These are the subaggregate series used in this thesis, but alternative aggregation could be carried out.

2.1 Alternative Classifications of Canadian Foreign Trade

The prime source of annual data on Canadian flows of trade is Trade of Canada published by Statistics Canada (Catalogue No. 65-201 to 65-203). It contains, on a commodity basis, the value of imports and exports, duties collected, re-exports and, whenever possible, physical quantities. Until 1960 commodities were classified by groups according to the component material. In 1961 for exports and in 1964 for imports the classification scheme was substantially altered so that Statistics Canada now publishes import and export data by commodity sections. In addition the Review of Foreign Trade (Statistics Canada, 65-205) offered until 1960 four additional classifications: by origin, by degree of manufacture, by purpose and according to the Standard International Trade Classification (SITC).

These series are available from 1926 on except for the last one which was introduced in 1951. Since 1960 finally, Statistics Canada has also published value series according to the stage of fabrication and on the basis of the revised (1961) SITC.

The Bank of Canada, in its monthly review, offers two more principles of classification: exports by commodity type and imports by end-use. Slater (1957), finally, constructed import series for nineteen commodity groups for selected years between 1928 and 1955.

Price and quantity series, however, exist for only some of these classifications. Statistics Canada publishes price and quantity indices (fixed weight Laspeyres and Paasche respectively), at the group level prior to 1960 and at the section level after 1960. In addition, more disaggregated indices were published in the Review of Foreign Trade until 1960. Since 1973 the Bank of Canada publishes price and quantity series which match with the main categories of the import and export classification. Unfortunately these series go back to 1961 only and for some imports, they are not available for 1962 and 1963. The last price series which is available is the one Kemp (1962) constructed for fourteen of Slater's import categories. For most categories Kemp calculated both direct and indirect indices, where the direct prices are based on the wholesale prices of close substitutes and the indirect prices are calculated by correcting import prices for insurance, freight, import duties, excise duties, wholesale mark-ups, etc. These series are available from 1926 to 1955.

In choosing a classification for our purposes, we would like to group import and exports in such a way so as to minimize aggregation errors. Such a notion of homogeneity is, however, very vague and it seems difficlt to decide a priori which classification would be best suited. On the other hand it is important not to disregard the relative difficulty of constructing price and quantity series according to the alternative classifications. This consideration has been primordial in the actual choice of classification.

It looked initially as an attractive possibility to extend Kemp's series from 1955 on. This appeared to be very difficult, however, since only little information is available on how his series were actually constructed, and regarding exports, the series would have had to be built from scratch. In addition, Kemp was mainly interested in obtaining price indices at the consumer level, which does not correspond to our needs, and finally, his import categories do not cover the totality of imports.

The Bank of Canada series is too short so it seemed natural to choose the classification of Statistics Canada. The new classification (by sections) will be used; this will make it possible to extend the series in future years without difficulty.

It will thus be necessary to make the conversion from the classification by groups to the classification by sections for the year 1948 to 1960. This will enable us to calculate Divisia indices at the section level for the whole period. We will now examine the two classifications in some more detail.

2.1.1. Classification by Groups

For both imports and exports, nine groups of commodities are distinguished on the basis of the component material:

Agricultural and vegetable products,

Animals and animal products,

Fibres and textiles,

Wood products and paper,

Iron and steel and products,

Non-ferrous metals and products,

Non-metallic minerals and products,

Chemicals and fertilizers,

Miscellaneous.

Each group is divided into subgroups and may contain several hundreds of different types of commodities. Some of these commodity types may change from year to year, but most changes are relatively unimportant. The price and quantity indices of aggregate imports or exports and of the various groups are described in DBS (1950). They are fixed weight Laspeyres price indices and Paasche quantity indices based on 1948. These indices were calculated on the basis of disaggregated price series defined for commodity subgroups or more generally for individual commodities. Those disaggregated price indices are in general import or export unit prices or sometimes price indices of close Canadian or U.S. substitutes. The price index of each group was then calculated using for weights the 1948 relative value of the particular commodities for which the price indices were defined, rather than the relative value of the whole subgroup. In some instances, small modifications to the trade classification were made (see DBS (1950)). The aggregate import or export price index in turn was calculated by weighting the group indices by the 1948 relative value of the corresponding group. This comes to say that within each group, the prices of all commodities for which an index is not explicitly available are assumed to be the same and equal to the price index calculated for this group.

This can be expressed algebraically using the following notation:

p_{ij}, q_{ij} price and quantity of commodity j of group i for which a price index is available;

p^*_{ik}, q^*_{ik} price and quantity of commodity k of group i for which a price index is not available.

$\tilde{P}_i$, the price index for group i such as it is calculated by Statistics Canada is therefore:

$$\tilde{P}^t_i = \frac{\Sigma\, p^t_{ij}\, q^o_{ij}}{\Sigma\, p^o_{ij}\, q^o_{ij}} = \frac{\Sigma\, p^t_{ij}\, v_{ij}}{\Sigma\, v_{ij}} = \frac{\Sigma\left(\frac{v_{ij}}{\Sigma v_{ij}}\frac{v_i}{v}\right) P^t_{ij}}{v_i/v} = \frac{\Sigma\, w_{ij}\, P^t_{ij}}{w_i}$$

where

$$v_{ij} = p^o_{ij}\, q^o_{ij}$$

$$v_i = \Sigma v_{ij} + \Sigma v^*_{ik}$$

$$v = \Sigma v_i$$

$$w_{ij} = \frac{v_{ij}}{\Sigma v_{ij}}\frac{v_i}{v}$$

$$w_i = \frac{v_i}{v_t}$$

and $$P^t_{ij} = \frac{p^t_{ij}}{p^o_{ij}} \; .$$

On the other hand the "complete" index P^t_i would be:

$$P^t_i = \frac{\Sigma v_{ij}\, P^t_{ij} + \Sigma v^*_{ik}\, P^{*t}_{ik}}{v_i} = \frac{\Sigma U_{ij}\, P^t_{ij} + \Sigma U^*_{ik}\, P^{*t}_{ik}}{w_i}$$

where $$U_{ij} = v_{ij}/v$$

$$U^*_{ik} = v^*_{ik}/v \; .$$

If we now assume that $P^{*t}_{ik} = \bar{P}^t_i = \tilde{P}^t_i$, $\forall k$ one can easily verify that $P^t_i = \tilde{P}^t_i$.

2.1.2. <u>Classification by Sections</u>

Since 1960 imported and exported goods have been classified according to the following sections:

Live animals,

Food, feed, beverages and tobacco,

Crude materials, inedible,

End products, inedible,

Special transactions

Each section again is divided in subgroups and contains hundreds of commodity types. In many cases there is a one to one correspondence between commodity types of the classification by groups and sections. This is in general not true at the subgroup level and obviously not at the group or section level. Regarding price indices, two subperiods have to be distinquished since the 1948 weights continued to be in use until 1967, when they were replaced by 1968 weights.

(i) 1960-1967 subperiod

The commodity base as well as the weights for the aggregate import or export price index remained unchanged from the period 1948 to 1960. The weight of each section in the aggregate index is therefore not equal to its 1948 relative value. Similarly, for the subaggregate indices calculated for each section, the weights attached to each price series do not reflect the relative importance of the corresponding commodity or commodity subgroup within the section. Instead those weights reflect the relative importance of the group to which they belonged under the old classification and the relative value of the other indexed commodities in the same group. The fact that the calculated price indices at the section level are not independent of the classification by groups is unfortunate and it would have been preferable to recompute in 1960 the (1948 or 1960) weights within each section.

(ii) 1967-1972 subperiod

In 1968 a new price index using 1968 weights was defined. The commodity base of this new index is somewhat different from the base of the 1948 index. According to the change in trade composition some series were added and others were discontinued. The 1968 weights were calculated on a similar fashion as the 1948 weights except that they were normalized to add up to unity within each section. Both the aggregate and the subaggregate (section level) series have been constructed back to 1967.

2.2 Disaggregated Price and Quantity Series

2.2.1. Price Series

Ideally we would have liked to obtain disaggregated price series covering the entire period 1948-1972. For some commodities, however, this was not possible since some series may have been discontinued or new ones may have appeared as the relative importance of a particular commodity type decreased or increased over time. In addition the definition of a subgroup or of a commodity type itself may have changed at some time, especially during the 1960 transition. We therefore obtained price series for three subperiods, although for many commodities, these series actually cover the entire period. The fact that some series do not cover the full period is not crucial for this study for the construction of current weight indices will not imply any computational difficulty. The commodities or subgroups for which price series are available and the series themselves are reported in Tables A.VI, A.VII, A.XII, and A.XIII.

Unfortunately it was not possible to obtain all series which have been used by Statistics Canada in computing their aggregate price indices. Because of limited resources we had to restrict ourselves to the major commodities. Thus for the period 1948-1960 we only retained the series which were consistently published in the Review of Foreign Trade (41 for exports, 42 for imports). From 1960 to 1972 the disaggregated series were not published, but they were made available to us by Statistics Canada. For the period 1960 to 1967 we only retained the series which already existed prior to 1960 or which continued from 1968 on. For the period 1967 to 1972 finally our series correspond, for either imports or exports, to the 40 major commodities.

2.2.2. Quantity Series

Value series corresponding to the disaggregated price series were then compiled. In most cases it has been assumed that all commodities within a subgroup were homogenous and had the same price. This procedure may seem preferable to that employed by Statistics Canada which assigns to any price series the weight of the corresponding commodity only and hence assigns the aggregate price of the particular section to all other goods of the subgroup.

All value series were constructed on the basis of the Trade of Canada figures. The code numbers of the commodities entering each series are available in Tables A.VII to A.XI. The quantity series finally were calculated by dividing the value series by the corresponding price series.

2.2.3. Computation of Price Series for Residual Commodities

As mentioned earlier, Statistics Canada has used, in computing price series at the group or section level, some additional disaggregated series which, however, are not available for this study. In order to pick up some of the effect of thos missing prices, price series for residual commodities were computed for each section or group.

We now use the following notation:

p_{ij}, q_{ij} price and quantity of good j of group (section) i for which we have a price series,

$\hat{p}_{ij}, \hat{q}_{ih}$ price and quantity of good h of group (section) i for which we do not have a price series, but for which a price series exists and has been used by Statistics Canada to compute the aggregate indices,

p^*_{ik}, q^*_{ik} price and quantity of good k of group (section) i for which there is no price series.

The aggregate price index has been calculated as

$$\tilde{P}^t_i = \frac{\Sigma v_{ij} P^t_{ij} + \Sigma \hat{v}_{ih} \hat{P}^t_{ih}}{\Sigma v_{ij} + \Sigma \hat{v}_{ih}} = \frac{\Sigma v_{ij} P^t_{ij} + \hat{v}_{ih} P^t_{ih} + \Sigma v^*_{ik} \tilde{P}^t_i}{\Sigma v_{ij} + \Sigma \hat{v}_{ih} + \Sigma v^*_{ik}}$$

However, we do not know $\hat{P}^t_{ik}$, $\forall k$, but we can define an aggregate price index for residual commodities as:

$$\bar{P}^t_i = \frac{\Sigma \hat{v}_{ij} \hat{P}^t_i + \Sigma v^*_{ik} \tilde{P}^t_i}{\Sigma \hat{v}_{ih} + \Sigma v^*_{ik}}$$

and $\bar{P}_i^t$ can then be computed from:

$$\tilde{P}_i^t = \frac{\Sigma v_{ij} P_{ij}^t + (\Sigma \hat{v}_{ih} + \Sigma v_{ik}^*) \bar{P}_i^t}{\Sigma v_{ij} + \Sigma \hat{v}_{ih} + v_{ik}^*} .$$

The weights (1948 or 1968 as the case may be) of Statistics Canada were used to compute these residual price series. These weights, which are reported in Tables A.VIII to A.XI, are not necessarily the same as those we could have calculated from our value series since for some series our commodity base may be somewhat larger.

2.3. Construction of Divisia Price Indices at the Section Level, 1948 to 1972

The disaggregated price and quantity series were used to construct price indices at the section level for the entire period 1948 to 1972. For this purpose imports and exports will be divided into four sections based on the classification of Statistics Canada:

(1,2) Live animals, food, feed, beverages and tobacco,

(3) Crude materials, inedible,

(4) Fabricated materials, inedible,

(5) End products, inedible.

Live animals have thus been added to the food section since live animals is a relatively small category. In addition special transactions were disregarded since no price series corresponding to any commodity in this category is available and since most of these commodities would be excluded from a model of the Canadian private sector.

2.3.1. Reconciliation Between Classification by Groups and by Sections, 1948 to 1960

The next step was to allocate the various commodity types to the different sections for the subperiod 1948 to 1960 in order to convert the classification by groups into the classification by sections. This was done on the basis of the conversion key published in Trade of Canada. This task was relatively straightforward for the individual commodity subgroups, but was considerably more complicated for the residual categories because of the hundreds of commodities involved. In some instances the allocation between sections had to be done at the commodity level in which case constant (1960) coefficients were used.

The value series we obtained at the section level differ only slightly from those compiled by Statistics Canada. It was, however, necessary to reconstruct these series in order to obtain the current weights for each commodity subgroup. Note also that the aggregate import and export values are somewhat less than those published on the basis of the classification by groups since some commodities fall into the special transaction category and are thus excluded from our series.

2.3.2 Computation of Divisia Price Indices at the Section Level and the Aggregate Level

Using our disaggregated price and quantity series, we next computed Divisia indices for each section and for aggregate imports or exports. A discrete approximation to the Divisia price index is (see Theil (1965) and Diewert (1974b)):

$$\ell n\ D^{1,0} = \Sigma\ \tfrac{1}{2}\ \left(\frac{p_i^1\ q_i^1}{\Sigma p_i^1 q_i^1} + \frac{p_i^o\ q_i^o}{\Sigma p_i^o q_i^o} \right)\ \ell n\ \frac{p_i^1}{p_i^o}\ .$$

For period t, the index can be calculated by recurrence like any other current weight index:

$$D^{t,o} = D^{t,t-1}\ .\ D^{t-1,o} = \prod_{i=1}^{t}\ D^{i,i-1}\ .$$

This price index is particularly suited when used to estimate a translog functional form since it has been shown that the Divisia index is exact for a homogenous translog (price) aggregator function (see Diewert (1974b)). We must note, however, that some of our disaggregated series do not cover the entire period. This would imply that the aggregator function is defined on a different space in each subperiod and weak separability can only be conceived within each subperiod.

The Divisia indices for aggregate imports or exports were computed from the disaggregated series directly, rather than from the subaggregate (section level) indices. All price series, normalized for 1961, and the corresponding value series are reported in Tables A.IV and A.V. The quantity indices can be obtained by dividing the value series by the corresponding price series. Those quantity indices, however, would not be exact Divisia indices.

2.3.3 Corrections for Import Duties and Re-exports

If those data are to be used in the framework of production theory, the prices we are interested in are the prices to the producers. It would have therefore been desirable to correct the existing (f.o.b.) prices for transportation, insurance and duties. Unfortunately, it was not possible to find data on transportation or insurance costs, particularly since we would have had to distinguish between Canadian and foreign agents.

Similarly, to be consistent one has to consider either imports net of re-exports, or add re-exports to the export figures. In the absence of any data on imports for home use only, we were left with the second alternative. This treatment of re-exports is particularly justified if there is value added to these commodities while in Canada (e.g., storage or manufacturing costs). We thus compiled import duty and re-export value series for the same commodity groups for which we earlier calculated quantity series (see Tables A.XIV and A.XV).

Import duties affect the price of imports faced by the producers since for a constant quantity, the cost of the imported commodity is increased by the amount of duties paid. If p_i, q_i, and m_i are respectively the price, the quantity and the cost net of duties of imported commodity i, the following relationships hold:

$$m_i = p_i \, q_i$$

and $$m_i + d_i = p_i^* \, q_i$$

where p_i^* is the price of import i corrected for import duties, and

$$p_i^* = \frac{m_i + d_i}{m_i} \; p_i \; .$$

After correcting the disaggregated price series of imports, we computed again the Divisia price indices at the section level and for total imports. These corrected price series and the corresponding value series are shown in Table A.II.

Re-exports on the other hand affect the disaggregated quantity indices only, if we assume that their price is the same as the price of the corresponding domestic exports. If p_i, q_i, and x_i are now the price, quantity and value of export i, we have:

$$x_i = p_i \, q_i$$

and

$$x_i + r_i = p_i \, q_i^*$$

hence

$$q_i^* = \frac{x_i + r_i}{p_i} \; .$$

The price of each export subgroup is thus unaffected. The corresponding weights, however, will be altered and this will affect the aggregate price series. The series corrected for re-exports are reported in Table A.III.

TABLE A.I Domestic Variables: Value and Price Series, 1948-1972
(Value and Quantity Series for Labour and Capital)

Year	Ind. Taxes	Investment	Consumption	Labour	Capital
1948	849000	6379855	11134000	9461236	8229690
1949	802000	6927191	12322000	10124303	8688129
1950	846000	7659285	13610000	10821065	9675240
1951	1122000	9386775	15714000	12170210	11280952
1952	1205000	9628392	17693000	13271248	12253294
1953	1251000	10357196	18675000	14191821	12003278
1954	1199000	10181440	19318000	14499874	11776078
1955	1270000	10711793	20862000	15139396	13254673
1956	1398000	12717352	22876000	16901824	13981761
1957	1437000	13689855	24301000	18299841	14553027
1958	1420000	13550405	25717000	18736274	15612832
1959	1587000	12764817	27313000	19987222	16044746
1960	1649000	13589611	28454000	20960936	16233069
1961	1660000	13833590	29111000	21951281	16518078
1962	1748000	14160194	30877000	23440524	18232864
1963	1855000	15097368	32720000	24984175	19335039
1964	2202000	17375766	35040000	27170571	20626137
1965	2560000	19510448	38180000	29972478	22079498
1966	2788000	22255882	41932000	33498927	24289644
1967	2923000	23101816	45381000	37306179	24941203
1968	2997000	23452309	49563000	40549971	26590807
1969	3182000	26343233	53596000	45411099	28813116
1970	3214000	27626739	57456000	49198473	30297441
1971	3533000	29409101	62530000	53829597	32956260
1972	3970000	32190892	69436000	59628690	36490924
1948	0.796	0.743	0.697	0.838	0.522
1949	0.734	0.780	0.730	0.852	0.537
1950	0.781	0.838	0.758	0.869	0.558
1951	1.051	0.966	0.858	0.882	0.578
1952	1.029	0.931	0.907	0.889	0.630
1953	1.060	0.910	0.903	0.900	0.663
1954	0.991	0.890	0.903	0.891	0.713
1955	0.949	0.906	0.902	0.901	0.750
1956	0.955	0.927	0.919	0.939	0.771
1957	1.032	0.941	0.945	0.964	0.848
1958	0.976	0.973	0.969	0.958	0.915
1959	1.024	0.982	0.979	0.981	0.924
1960	0.988	0.990	0.988	0.992	0.962
1961	1.000	1.000	1.000	1.000	1.000
1962	0.978	1.013	1.019	1.042	1.053
1963	0.977	1.034	1.030	1.073	1.080
1964	1.051	1.053	1.043	1.118	1.126
1965	1.111	1.082	1.072	1.169	1.207
1966	1.128	1.131	1.117	1.195	1.291
1967	1.122	1.163	1.156	1.237	1.386
1968	1.082	1.164	1.206	1.258	1.465
1969	1.101	1.218	1.244	1.308	1.523
1970	1.091	1.254	1.301	1.356	1.610
1971	1.147	1.305	1.343	1.379	1.678
1972	1.225	1.387	1.386	1.421	1.714

TABLE A.II Value and Price Series for Aggregate Imports and By Section (Series Corrected for Import Duties)

Year	Total	Section 1,2	Section 3	Section 4	Section 5
1948	2804038.	342779.	664950.	821570.	974739.
1949	2908845.	367293.	601992.	836274.	1103286.
1950	3349235.	432439.	733879.	915458.	1267459.
1951	4286794.	483406.	893681.	1221883.	1687825.
1952	4186314.	470867.	698642.	1135481.	1881324.
1953	4585753.	474072.	651745.	1236801.	2223135.
1954	4259806.	522875.	587993.	1126383.	2022555.
1955	4932109.	535280.	692126.	1314783.	2389920.
1956	5991302.	598853.	817733.	1677609.	2897107.
1957	5899357.	633401.	823125.	1657005.	2785826.
1958	5461366.	648945.	681959.	1462789.	2667673.
1959	5953018.	657686.	720835.	1546089.	3028408.
1960	5903629.	661102.	739552.	1494444.	3008531.
1961	6199949.	705834.	769122.	1539461.	3185532.
1962	6772798.	747378.	833228.	1664655.	3527537.
1963	7020175.	857547.	903030.	1737935.	3521663.
1964	7915432.	873514.	968536.	1998383.	4074999.
1965	9057694.	859034.	1015155.	2321870.	4861635.
1966	10296754.	900974.	1033192.	2449044.	5913544.
1967	11619102.	988398.	1072494.	2541188.	7017022.
1968	12892804.	1014166.	1136393.	2665161.	8077084.
1969	14847497.	1178955.	1090503.	3170358.	9407681.
1970	14681334.	1229508.	1175265.	3137282.	9139279.
1971	16449797.	1278040.	1326881.	3422447.	10422429.
1972	19698403.	1532277.	1546659.	3911214.	12708253.
1948	0.826	1.030	0.991	0.837	0.736
1949	0.842	1.047	0.998	0.836	0.769
1950	0.904	1.111	1.074	0.891	0.831
1951	1.024	1.257	1.284	1.027	0.903
1952	0.914	1.101	1.080	0.900	0.843
1953	0.905	1.039	1.066	0.903	0.839
1954	0.902	1.096	1.057	0.878	0.839
1955	0.922	1.064	1.062	0.900	0.870
1956	0.948	1.060	1.056	0.920	0.912
1957	0.969	1.102	1.090	0.939	0.929
1958	0.976	1.076	1.057	0.946	0.951
1959	0.964	0.985	1.013	0.940	0.959
1960	0.976	0.978	0.990	0.969	0.976
1961	1.000	1.000	1.000	1.000	1.000
1962	1.050	1.052	1.040	1.046	1.054
1963	1.060	1.147	1.036	1.043	1.055
1964	1.066	1.143	1.031	1.067	1.055
1965	1.057	1.075	1.045	1.067	1.049
1966	1.059	1.071	1.059	1.052	1.057
1967	1.064	1.025	1.052	1.058	1.071
1968	1.085	1.053	1.063	1.079	1.093
1969	1.109	1.099	1.085	1.078	1.123
1970	1.129	1.141	1.099	1.099	1.140
1971	1.145	1.159	1.116	1.101	1.159
1972	1.178	1.228	1.205	1.124	1.185

TABLE A.III Value and Price Series for Aggregate Exports and by Section (Series Corrected for Re-exports)

Year	Total	Section 1,2	Section 3	Section 4	Section 5
1948	3076107.	929368.	319920.	1406335.	420484.
1949	2995031.	981635.	322030.	1321055.	370311.
1950	3130340.	901862.	346178.	1612269.	270031.
1951	3926870.	1120093.	449916.	1996773.	360088.
1952	4318448.	1329162.	486100.	2050503.	452683.
1953	4137165.	1262656.	493508.	1962760.	418241.
1954	3911297.	984778.	507502.	2058789.	360228.
1955	4308977.	905395.	706972.	2377623.	318987.
1956	4806971.	1099985.	900262.	2449096.	357628.
1957	4856935.	968029.	1053460.	2416129.	419317.
1958	4878984.	1136289.	979504.	2258565.	504626.
1959	5124418.	1078168.	1099577.	2476972.	469701.
1960	5367235.	990957.	1131759.	2750666.	493853.
1961	5858353.	1269976.	1204405.	2778403.	605569.
1962	6300764.	1246191.	1370521.	2915721.	768331.
1963	6919939.	1469732.	1435750.	3120547.	893910.
1964	8236376.	1848905.	1622478.	3521383.	1243610.
1965	8704283.	1719563.	1772000.	3752418.	1460302.
1966	10264085.	1976507.	1956833.	4029941.	2300804.
1967	11356978.	1656852.	2115962.	4251423.	3332741.
1968	13580261.	1624958.	2475152.	4915482.	4564669.
1969	14892544.	1485876.	2473726.	5240488.	5692454.
1970	16785422.	1900959.	3093307.	5945885.	5845271.
1971	17788191.	2131414.	3271756.	5916328.	6468693.
1972	20091637.	2381128.	3569552.	6697291.	7443666.
1948	0.800	0.928	0.704	0.798	0.650
1949	0.826	0.975	0.731	0.803	0.696
1950	0.867	0.992	0.787	0.856	0.731
1951	0.977	1.037	0.920	0.999	0.816
1952	0.971	1.008	0.915	1.004	0.822
1953	0.945	0.988	0.887	0.968	0.818
1954	0.923	0.938	0.868	0.957	0.813
1955	0.949	0.937	0.906	0.993	0.830
1956	0.981	0.934	0.956	1.035	0.875
1957	0.972	0.918	0.953	1.016	0.909
1958	0.964	0.927	0.934	0.999	0.928
1959	0.980	0.953	0.946	1.011	0.948
1960	0.991	0.964	0.983	1.009	0.970
1961	1.000	1.000	1.000	1.000	1.000
1962	1.034	1.082	1.041	1.014	1.020
1963	1.039	1.072	1.066	1.016	1.026
1964	1.057	1.094	1.075	1.037	1.036
1965	1.066	1.075	1.102	1.052	1.046
1966	1.100	1.119	1.153	1.081	1.063
1967	1.117	1.159	1.175	1.096	1.061
1968	1.149	1.132	1.203	1.163	1.080
1969	1.176	1.121	1.227	1.209	1.100
1970	1.202	1.084	1.280	1.240	1.127
1971	1.204	1.109	1.253	1.225	1.150
1972	1.244	1.192	1.273	1.280	1.171

TABLE A.IV Value and Price Series for Aggregate Imports and by Section

Year	Total	Section 1,2	Section 3	Section 4	Section 5
1948	2587822.	305577.	650890.	753266.	878089.
1949	2687671.	326251.	591735.	765942.	1003743.
1950	3100827.	394989.	723682.	839927.	1142229.
1951	3954690.	437579.	882200.	1120985.	1513926.
1952	3845349.	418301.	688970.	1043170.	1694908.
1953	4190350.	416683.	642171.	1122805.	2008691.
1954	3889915.	468710.	579935.	1023909.	1817361.
1955	4505323.	475854.	683690.	1197282.	2148497.
1956	5473001.	536016.	807625.	1540327.	2589033.
1957	5399069.	568188.	813889.	1515484.	2501508.
1958	4971984.	574252.	674692.	1322748	2400292.
1959	5429420.	582963.	713762.	1400003.	2732692.
1960	5389102.	588515.	732542.	1348466.	2719579.
1961	5667054.	628804.	762797.	1388181.	2887272.
1962	6130274.	664421.	826464.	1488781.	3150608.
1963	6419852.	780150.	896296.	1571009.	3172397.
1964	7269572.	794720.	960662.	1812988.	3701202.
1965	8366668.	769692.	1006274.	2114423.	4476279.
1966	9544408.	804651.	1023212.	2233137.	5483408.
1967	10805934.	883491.	1062268.	2310208.	6549967.
1968	12099071.	918187.	1126744.	2434586.	7619554.
1969	13938292.	1062662.	1085460.	2905331.	8884839.
1970	13790274.	1115552.	1171572.	2885422.	8617728.
1971	15450951.	1156851.	1321725.	3140164.	9832211.
1972	18466946.	1400491.	1539784.	3578991.	11947680.

Year	Total	Section 1,2	Section 3	Section 4	Section 5
1948	0.819	1.009	0.987	0.844	0.722
1949	0.837	1.030	0.995	0.843	0.759
1950	0.900	1.124	1.076	0.898	0.814
1951	1.018	1.266	1.288	1.033	0.880
1952	0.909	1.091	1.082	0.910	0.826
1953	0.899	1.016	1.067	0.905	0.828
1954	0.897	1.093	1.057	0.880	0.826
1955	0.916	1.054	1.063	0.904	0.856
1956	0.942	1.060	1.056	0.932	0.893
1957	0.966	1.106	1.091	0.948	0.914
1958	0.970	1.069	1.057	0.948	0.939
1959	0.959	0.975	1.014	0.941	0.950
1960	0.972	0.973	0.990	0.968	0.969
1961	1.000	1.000	1.000	1.000	1.000
1962	1.040	1.048	1.040	1.037	1.039
1963	1.059	1.176	1.037	1.044	1.045
1964	1.068	1.171	1.032	1.071	1.054
1965	1.067	1.084	1.046	1.075	1.062
1966	1.073	1.080	1.059	1.063	1.076
1967	1.080	1.036	1.052	1.066	1.095
1968	1.108	1.075	1.064	1.092	1.125
1969	1.134	1.116	1.089	1.094	1.157
1970	1.155	1.169	1.105	1.118	1.175
1971	1.169	1.187	1.120	1.119	1.191
1972	1.202	1.272	1.210	1.141	1.214

TABLE A.V Value and Price Series For Aggregate Exports and by Section

Year	Total	Section 1,2	Section 3	Section 4	Section 5
1948	3042581.	927404.	314346.	1400578.	400253.
1949	2966539.	980190.	316180.	1315911.	354258.
1950	3092377.	899873.	338716.	1605960.	247828.
1951	3878880.	1117915	440337.	1986866.	333762.
1952	4264678.	1324634.	476953.	2042468.	420623.
1953	4083276.	1260162.	484749.	1954534.	383831.
1954	8347035.	981925.	498399.	2050130.	316581.
1955	4241183.	900822.	697442.	2368036.	274883.
1956	4737122.	1096419.	890948.	2439434.	310321.
1957	4766183.	964766.	1041168.	2403659.	356590.
1958	4778239.	1133127.	965707.	2244330.	435075.
1959	5010222.	1074622.	1081786.	2463222.	390592.
1960	5241615.	987016.	1112653.	2733618.	408328.
1961	5743082.	1264704.	1195442.	2777345.	505591.
1962	6163673	1240189.	1361595.	3907126.	654763.
1963	6773815.	1461828.	1425951.	3106898.	779138.
1964	8068047.	1840400.	1616145.	3502496.	1109006.
1965	8501566.	1708951.	1763701.	3728769.	1300145.
1966	10045312.	1966295.	1947625.	4012068.	2119324.
1967	11098204.	1644608.	2108298.	4229365.	3115933.
1968	13232262.	1613122.	2467578.	4855098.	4296464.
1969	14468431.	1464211.	2463323.	5162695.	5378202.
1970	16369868.	1868453.	3084013.	5866452.	5550950.
1971	17366053.	2112352.	3263710.	5796816.	6183175.
1972	19618867.	22355083.	3559586.	6568031	7136167.
1948	0.801	0.928	0.703	0.798	0.649
1949	0.828	0.976	0.731	0.803	0.695
1950	0.868	0.992	0.786	0.856	0.730
1951	0.977	1.037	0.919	0.999	0.814
1952	0.973	1.008	0.916	1.004	0.821
1953	0.946	0.988	0.887	0.968	0.817
1954	0.924	0.938	0.867	0.957	0.812
1955	0.949	0.937	0.906	0.993	0.828
1956	0.982	0.934	0.957	1.035	0.873
1957	0.972	0.918	0.953	1.016	0.907
1958	0.964	0.927	0.935	0.999	0.926
1959	0.979	0.952	0.946	1.011	0.948
1960	0.991	0.964	0.983	1.009	0.970
1961	1.000	1.000	1.000	1.000	1.000
1962	1.034	1.083	1.041	1.014	1.019
1963	1.039	1.073	1.066	1.016	1.025
1964	1.057	1.095	1.075	1.037	1.035
1965	1.066	1.076	1.102	1.052	1.044
1966	1.100	1.120	1.153	1.081	1.061
1967	1.117	1.161	1.175	1.096	1.058
1968	1.149	1.133	1.203	1.163	1.078
1969	1.176	1.123	1.227	1.210	1.097
1970	1.200	1.084	1.280	1.239	1.123
1971	1.202	1.109	1.253	1.224	1.145
1972	1.241	1.190	1.273	1.279	1.167

TABLE A.VI Summary Table of Disaggregated Import Series

Series	Subperiod 1	2	3	Series	Subperiod 1	2	3
Section 1,2							
Bananas	x			Tea	x	x	x
Citrus Fruits	x			Whisky	x		
Fruits, Dried	x			Fresh Fruits		x	x
Nuts	x			Indian Corn		x	x
Vegetables*	x	x	x	Meat			x
Sugar	x	x	x	Ind. Chemicals 12	x		
Cocoa Beans	x	x	x	Live Animals		x	x
Coffee	x	x	x				
Section 3							
Soyabeans	x	x	x	Iron Ore*	x	x	x
Furs, Undressed	x	x		Coal, Anthr.	x	x	
Cotton, Raw	x	x	x	Coal, Bitum*	x	x	x
Wool, Raw*	x	x	x	Petroleum	x	x	x
Wool, Tops	x	x	x	Rubber 3*	x	x	x
Sisal	x			Hides		x	x
Synthetic 3	x	x		Bauxite, Alum.		x	x
Paperboard 3	x			Copper Ores		x	x
Section 4							
Vegetable Oils*	x	x		Fertilizers A	x		
Cotton, Fabrics*	x	x	x	Fertilizers B		x	
Jute*	x	x	x	Paint 4	x		
Worsteds	x	x	x	Ind. Chemicals 4*	x	x	x

TABLE A.VI (Continued)

Section 4

Synth. Fabrics 4	x			Rubber 4*	x	
Paperboard 4*	x	x		Coated Fabrics		x
Rolling Mill Prod.*	x	x	x	Veneers		x
Tin, Blocks	x	x	x	Heavy Fuels		x
Bricks	x			Inorg. Chemicals		x
Glass*	x	x		Org. Chemicals		x
Gasoline*	x	x	x			

Section 5

Newspapers	x			Chinaware	x	
Paperboard 5	x			Paint 5	x	
Farm Machinery	x	x	x	Ind. Chemicals 5	x	
Machinery*	x	x		Cons. Goods, Misc.	x	
Automobiles*	x	x	x	Rubber 5	x	
Electric. Apparatus*	x	x	x	Drilling Machinery		x

The x indicates that the particular series is available for the corresponding subperiod.

The * indicates that the pre- and post-1960 subseries are not entirely consistent due to changes in classification.

TABLE A.VII Summary Table of Disaggregated Export Series

Series	Subperiod 1	Subperiod 2	Subperiod 3	Series	Subperiod 1	Subperiod 2	Subperiod 3
Section 1,2							
Wheat	x	x	x	Cattle, Dairy	x		
Barley	x	x	x	Cattle, Slaughter	x		
Whisky	x	x	x	Milk	x	x	
Wheat Flower	x	x	x	Eggs in the Shell	x	x	
Oats	x	x		Cheese		x	x
Tobacco	x	x	x	Fish & Fish Prod. 12*	x	x	x
Beef & Veal	x	x	x	Live Animals		x	x
Section 3							
Fish & Fish Prod. 3	x			Nickel 3	x		x
Leather 3	x			Zinc 3	x		
Furs, Undressed	x	x	x	Silver 3	x		
Hides	x	x	x	Platinum*	x		x
Pulpwood	x	x	x	Asbestos A	x		
Iron Ore	x	x	x	Asbestos B		x	x
Copper 3	x			Coal	x	x	
Lead 3	x			Petroleum			x
Aluminum 3	x			Natural Gas			x
Section 4							
Fish & Fish Prod. 4	x			Lead 4	x		
Leather A	x			Aluminum 4*	x	x	x
Leather B		x		Nickel 4	x	x	x
Newsprint	x	x	x	Zinc 4	x	x	x
Wood Pulp	x	x	x	Silver 4	x		
Planks	x	x	x	Abrasives*	x	x	x
Shingles	x	x		Fertilizers	x	x	

TABLE A.VII (Continued)

Section 4						
Plywood	x	x		Rolling Mill Prod.	x	x
Pig Iron	x	x	x	Electricity	x	x
Copper 4	x	x	x	Chemicals		x
Section 5						
Farm Machinery*	x	x	x	Cons. Goods, Misc.	x	x
Machinery*	x	x	x	Rubber	x	x
Automobiles*	x	x	x			

An x indicates that the particular series is available for the corresponding subperiod.

The * indicates that the pre- and post-1960 subseries are not entirely consistent due to changes in classification.

TABLE A.VIII Disaggregated Import Series, 1948-1960
Code Numbers and 1948 Weights

Series	Weight (%)	Code Number
Bananas	0.93	3
Citrus Fruits	0.91	6, 9, 10, 13
Fruits, Dried	0.51	31, 32, 34, 36-42
Nuts	1.17	81-108
Vegetables	0.32	111-128, 135, 136
Soyabeans	0.50	162
Sugar	3.36	262, 263
Cocoa	0.80	271
Coffee	1.25	283, 284
Tea	0.86	319/321-336
Whisky	0.44	1515
Vegetable Oils	0.51	1601-1628, 231-236
Furs, Undressed	1.18	2155-2169
Cotton, Raw	3.39	3001
Cotton, Fabrics	1.33	3026-3050
Jute	1.04	3134
Wool, Raw	1.35	3261-3264
Wool, Tops	1.43	3266, 3268, 3269
Worsteds	1.91	3288
Sisal	0.68	3413
Synth. Fabrics 3	1.08	3365-3367
Synth. Fabrics 4	-	3371-3373
Newspapers	1.13	4266, 4267, 4310
Paperboard 3	1.20	4209
Paperboard 4	-	4159-4260÷Paper 3 & 5
Paperboard 5	-	4179, 4188, 4202, 4204, 4211, 4215, 4216, 4220, 4229-4231, 4235, 4238, 4241-4246, 4253-4260

TABLE A.VIII (Continued)

Iron Ore	0.59	5001
Rolling Mill Prod.	1.41	5070-5177
Farm Machinery	5.33	5290-5363
Machinery	8.26	5441-5599
Automobiles	5.80	5242, 5245, 5252, 5641-5650, 5661, 5672
Tin, Blocks	0.51	6101
Electric App.	3.18	6139-6325
Bricks	0.46	7021-7034
Chinaware	0.58	7046
Coal Anthr.	2.65	7061-7063
Coal Bitum.	6.00	7064
Glass	0.53	7090-7100
Petroleum	9.03	7153
Gasoline	2.18	7161, 7162, 7164, 7165, 7169, 7171-7175
Fertilizers	0.58	8149-8167
Paint 4	1.07	8171-8216%8211
PaintC5 [illegible] als 2	-	8211
Ind. Chemicals 2	0.92	8305
Ind. Chemicals 4	-	8001-8038, 3251-8380%8305, 8010, 8024
Ind. Chemicals 5	-	8010, 8024
Cons. Goods, Misc.	2.15	9001-9025, 9050-9092, 9117-9121, 9181-9185, 9250, 9261, 9275
Rubber 3	1.51	1678, 1680, 1683, 1687
Rubber 4	-	1678-1732%Rubber 3 & 5
Rubber 5	-	1702, 1703, 1705-1707, 1710, 1712, 1714-1719, 1721, 1723, 1725, 1731, 1732

TABLE A.VIII (Continued)

<u>Groups</u>

Agricultural & Animal	16.48
Textiles	13.30
Wood	2.80
Iron	29.67
Non-Ferrous	5.91
Non-Metallic	22.99
Chemicals	4.49
Miscellaneous	4.37

<u>Residual Series</u>

Agricultural & Animal 1,2	residual series of group 1 and 2
Agricultural & Animal 3	1571-1573, 1576-1579, 1646-1669, 1744-1766 (%1758, 1759), 1811, 1813, 1816, 1825, 1827, 1833, 1836, 1841, 1843, 2051, 2052, 2081, 2086, 2073, 2093, 2152, 2174, 2191-2193, 2200-2206, 2219, 2283, 2307, 2321, 2336, 2339, 2343, 2344
Agricultural & Animal 4	1580, 1581, 1584, 1824, 1832, 1835, 1840, 1846 2053, 2054, 2084, 2085, 2172, 2173, 2175, 2181, 2210, 2211, 2213, 2215-2218, 2220, 2221, 2224-2226, 2294, 2295, 2297, 2299, 2239, 2241, 2243, 2244, 2288, 2289, 2293, 2302, 2304, 2308, 2320, 2331-2333, 2338
Agricultural & Animal 5	2083, 2195, 2232-2238, 2245, 2246, 2300, 2303
Textiles 3	3002, 3111-3113, 3201, 3202, 3265, 3267, 3270, 3411, 3412, 3414, 3421, 3423, 3451-3453
Textiles 4	3004-3009, 3011-3023, 3051-3055, 3083, 3085, 3086, 3092, 3097, 3114, 3115, 3121-3126, 3132, 3135-3139, 3174, 3179, 3180, 3213, 3216, 3224, 3228-3230, 3273-3277, 3281-3284, 3286, 3287, 3289, 3291-3293, 3343, 3345 (0.5), 3360-3362, 3364, 3368, 3369, 3390, 3391, 3401, 3420, 3422, 3428, 3454, 3461, 3463-3465, 3472-3474, 3476, 3478-3481, 3483-3486, 3488, 3489, 3501, 3524, 3548, 3551, 3553, 3559-3561, 3563, 3564, 3567, 3568, 3570, 3574, 3576

TABLE A.VIII (Continued)

Textiles 5	3062-3064, 3066-3074, 3082, 3084, 3087, 3088, 3091, 3094-3096, 3098, 3100, 3162, 3171-3173, 3175-3178, 3244, 3246-3248, 3251, 3252, 3301-3310, 3320-3329, 3342, 3344, 3345 (0.5), 3376, 3378-3380, 3383-3388, 3392, 3393, 3424, 3425, 3429, 3460, 3475, 3487, 3510-3512, 3514-3522, 3550, 3552, 3554, 3557, 3566, 3573
Wood 3	4002, 4003, 4021, 4024, 4026, 4081, 4083, 4085
Wood 4	4011, 4022, 4025, 4032-4034, 4041-4043, 4045-4059, 4067, 4069, 4071, 4073-4079, 4084, 4094, 4097, 4099, 4101-4105, 4112, 4114, 4118, 4119, 4130, 4132-4136, 4142 (0.5), 4143, 4148, 4150, 4153, 4155, 4157
Wood 5	4091, 4120, 4125, 4141, 4142 (0.5), 4144-4146, 4151, 4152, 4154, 4156, 4158, 4260, 4262, 4263, 4265, 4268, 4269, 4271, 4272, 4290-4296, 4301-4303, 4305-4309, 4311
Iron 3	5031, 5032, 5033
Iron 4	5010-5015, 5018-5023, 5025, 5027, 5029, 5044-5052, 5054, 5055, 5058, 5059, 5181, 5182, 5185-5193, 5195-5199, 5200, 5201, 5203-5211, 5213-5221, 5223-5225, 5231, 5233-5236, 5381, 5391, 5393-5395, 5411-5413, 5422, 5423, 5594, 5691, 5694, 5700, [illegible], 5708, 5709, 5713, 5714 (0.36), 5729, 5894
Iron 5	5240-5244, 5246, 5248, 5251, 5253-5260, 5265-5268, 5275, 5280, 5283, 5371-5378, 5400-5404, 5421, 5425, 5426, 5600-5607, 5621-5632, 5651-5658, 5660, 5663, 5664, 5674, 5680-5683, 5685-5687, 5689, 5690, 5692, 5693, 5695-5699, 5701-5703, 5706, 5714 (0.64), 5715-5731, 5733-5740, 5892-5893
Non-Ferrous 3	6001-6003, 6005, 6022, 6110, 6208, 6210, 6215-6217, 6257
Non-Ferrous 4	6004, 6006, 6007, 6009-6013, 6014 (0.72), 6015, 6023-6025, 6031, 6033, 6034, 6035 (0.67), 6042-6044, 6046-6048, 6050-6052, 6070-6075, 6082 (0.5), 6084, 6085, 6087, 6088, 6091, 6102, 6112, 6113, 6115, 6116 (0.6), 6117, 6119-6121, 6123-6126, 6211, 6212, 6218-6220, 6229, 6235, 6238-6241, 6247-6253, 6258, 6259

TABLE A.VIII (Continued)

Non-Ferrous 5	6014 (0.28), 6026, 6030, 6032, 6035 (0.33), 6037, 6049, 6061-6063, 6065, 6068, 6077, 6082 (0.5), 6086, 6093, 6094, 6103, 6116 (0.4), 6127-6136, 6138, 6181-6183, 6191-6197, 6199, 6200, 6201, 6221-6223, 6225-6228, 6230, 6233, 6234, 6236, 6237, 6260
Non-Metallic 1, 2	7296
Non-Metallic 3	7011-7016, 7019, 7060, 7061, 7066, 7067, 7131, 7154, 7158, 7192, 7193, 7200, 7210, 7215, 7221, 7231, 7233, 7256-7258, 7263-7266, 7268, 7272, 7273, 7280, 7281, 7289, 7290, 7297-7299, 7301 (0.25), 7302, 7304
Non-Metallic 4	7001-7005, 7017, 7018, 7053, 7055, 7056, 7070-7074, 7077, 7081, 7084, 7086, 7111-7113, 7119-7123, 7127-7129, 7132, 7133, 7138, 7139, 7141, 7143, 7151, 7156, 7163, 7166-7168, 7181-7183, 7185-7187, 7191, 7194-7196, 7199, 7202, 7203, 7216, 7218, 7223-7227, 7232, 7234, 7235, 7241, 7243, 7261, 7269, 7271, 7274, 7275, 7282-7284, 7286, 7288, 7291, 7292, 7295, 7300, 7301 (0.75), 7303, 7305
Non-Metallic 5	7043, 7045, 7047, 7048, 7051, 7052, 7079, 7080, 7082, 7083, 7085, 7087-7089, 7114 7124-7126, 7184, 7254, 7270, 7284
Chemicals 2	8423, 8433
Chemicals 3	8115
Chemicals 4	8046, 8069-8073, 8078, 8091, 8092, 8094, 8095, 8104-8106, 8109, 8111, 8113, 8114, 8116-8119, 8121, 8131-8134, 8136-8138, 8388, 8389, 8391, 8394-8399, 8400-8406, 8408, 8410-8412, 8414, 8415 (0.85), 8416, 8417, 8422, 8425, 8428-8431, 8434, 8435, 8437, 8500, 8530, 8550, 8570, 8600, 8630, 8650, 8670, 8700 (0.4), 8720, 8750, 8770, 8800, 8830, 8850, 8870, 8900, 8930, 8950 (0.4)
Chemicals 5	8052-8054, 8056, 8059, 8074-8076, 8079, 8081-8086, 8135, 8221, 8222, 8224, 8232, 8234-8236, 8238, 8392, 8393, 8407, 8413, 8415 (0.15), 8432, 8700 (0.6), 8950 (0.6)
Miscellaneous 1, 2	9103

TABLE A.VIII (Continued)

Miscellaneous 3	9269
Miscellaneous 4	9135, 9187, 9199, 9209, 9215, 9249, 9253, 9262
Miscellaneous 5	9110, 9111, 9114-9118, 9120-9124, 9127-9130, 9132-9134, 9136-9150, 9152, 9153, 9155-9157, 9160-9164, 9166, 9168, 9169, 9171-9175, 9181-9184, 9197, 9202, 9204, 9207, 9208, 9212, 9237-9240, 9242-9244, 9246, 9247, 9252, 9254-9260, 9263, 9265-9267, 9270, 9271, 9273

TABLE A.IX Disaggregated Export Series, 1948-1960
Code Numbers and 1948 Weights

Series	Weight (%)	Code Number
Wheat	10.12	430
Barley	1.13	340
Whisky	1.13	1030
Wheat Flower	5.21	500
Oats	0.93	380
Tobacco	0.30	1500, 1510, 1520, 1530, 1540
Beef	1.52	2605
Cattle, Slaughter	2.31	2045, 2050, 2055
Cattle, Dairy	0.49	2010, 2035, 2040
Milk	0.35	2715, 2720, 2725, 2730
Eggs	1.01	2820
Fish 2	1.91	2115-2405*/Fish 3 & 4
Fish 3	-	2392, 2394, 2395
Fish 4	-	2398, 2400, 2405
Leather 3	0.32	2557
Leather 4	-	2535, 2540, 2545, 2550, 2551, 2555, 2560
Furs	0.76	2420-2470
Hides	0.35	2505
Newsprint	13.85	4830
Wood Pulp	7.50	4630, 4635, 4645, 4650, 4655, 4660, 4670-4672, 4680, 4685, 4690
Planks	6.74	4240, 4250, 4260, 4270, 4280, 4290, 4300, 4310, 4320, 4330, 4340
Pulpwood	1.58	4530, 4540, 4550, 4555
Shingles	0.80	4430
Plywood	0.43	4455, 4457
Iron Ore	0.48	5010
Farm Machinery	4.71	5290-5470
Machinery	0.63	5580-5710

TABLE A.IX (Continued)

Pig Iron	0.32	5055
Automobiles	3.51	5770, 5780, 5790, 5800, 5810, 5820
Copper 3	2.63	6130, 6150
Copper 4	-	6160, 6170
Lead 3	1.20	6220, 6230
Lead 4	-	6240
Aluminum 3	3.25	6010
Aluminum 4	-	6020, 6025
Nickel 3	2.58	6260, 6270
Nickel 4	-	6280
Zinc 3	1.44	6370, 6390
Zinc 4	-	6380
Silver 3	0.23	6330
Silver 4	-	6340
Platinum	0.58	6310, 6320
Asbestos	1.92	7010, 7020, 7030
Abrasives	0.64	7360
Coal	0.53	7110, 7120
Fertilizers	1.19	8160, 8180, 8190

<u>Groups</u>

Agricultural & Animal	33.99
Textiles	1.48
Wood	31.01
Iron	11.80
Non-Ferrous	12.87
Non-Metallic	3.09
Chemicals	2.60
Miscellaneous	3.16

<u>Residual Series</u>

Agricultural & Animal 1,2	Residuals, agricultural and animal
Agricultural & Animal 3	345, 1080, 1160, 1170, 1190, 1200, 1360-1470, (÷1460), 1600, 1680, 1690, 1700, 2100, 2110, 2112, 2485-2490, 2500-2520(÷2505), 2705, 2812, 2813, 2825, 2835

TABLE A.IX (Continued)

Agricultural and Animal 4	610, 1110-1140, 1210, 1220, 1270, 1280, 1290, 1300, 1305, 1340, 1720, 1730, 2472, 2475, 2565, 2580, 2750, 2754, 2756, 2759, 2768, 2769, 2773-2775, 2780, 2790, 2805-2807, 2830
Agricultural and Animal 5	1230, 1240, 1260, 1311, 1315, 1317, 1319, 1321, 1325, 1330, 2480, 2570, 2574, 2575, 2577, 2585, 2590, 2593, 2553, 2561, 2563, 2565, 2566, 2810
Textiles 3	3010, 3020, 3080, 3090, 3095, 3160, 3170, 3180, 3183, 3185, 3187, 3320
Textiles 4	3015, 3030, 3035, 3040, 3070, 3100, 3140, 3186, 3200, 3250, 3261, 3262, 3300, 3330, 3335, 3337, 3340, 3350, 3355, 3360, 3370, 3413, 3435, 3437, 3450, 3455, 3460
Textiles 5	3042, 3044, 3047, 3050, 3060, 3062, 3064, 3066, 3068, 3130, 3190, 3202, 3205, 3207, 3210, 3225, 3230, 3270, 3280, 3290, 3380, 3385, 3390, 3400, 3405, 3407, 3409, 3415, 3420, 3430
Wood 3	4010, 4015-4080, 4090, 4100, 4110, 4120, 4130, 4220, 4425, 4470, 4500, 4510, 4570, 4910, 4920
Wood 4	4140, 4150, 4160, 4200, 4205, 4350, 4360, 4370, 4380, 4400, 4410, 4420, 4440, 4450, 4460, 4465, 4560, 4620, 4720, 4740, 4760, 4770, 4780, 4790, 4800, 4810, 4835, 4840, 4850, 4860, 4880, 4890, 4900, 4925, 4930, 4940, 4951
Wood 5	4600, 4605, 4610, 4705, 4710, 4730, 4750, 4772, 4775, 4865, 4870, 4945, 4947, 4957, 4960, 4970, 4980, 4990
Iron 3	5070
Iron 4	5015, 5020, 5030, 5040, 5050, 5057, 5060, 5080, 5090, 5100, 5110, 5120, 5130, 5140 5150, 5160, 5165, 5170, 5180, 5190, 5195, 5200, 5210, 5220, 5240, 5510, 5515, 5520, 5530, 5540, 5545, 5550, 5570, 5905, 5920, 5960
Iron 5	5230, 5260, 5270, 5490, 5500, 5560, 5720, 5725, 5730, 5740, 5745, 5750, 5755, 5757, 5760, 5830, 5840, 5850, 5851, 5855, 5859, 5860, 5870, 5875, 5877, 5880, 5890, 5900, 5910, 5925, 5930, 5935, 3940, 5945, 5950, 5955, 5965, 5970
Non-Ferrous 3	6080, 6300, 6560, 6570, 6573, 6575, 6580, 6620, 6630

TABLE A.IX (Continued)

Non-Ferrous 4	6027, 6040, 6050, 6090, 6095, 6100, 6105, 6110, 6175, 6180, 6190, 6200, 6210, 6245, 6250, 6350, 6400, 6590, 6600, 6605, 6610, 6615, 6640, 6642, 6645, 6650, 6655, 6660, 6670, 6680
Non-Ferrous 5	6030, 6410, 6420, 6431, 6432, 6440, 6450, 6460, 6470, 6475, 6480, 6483, 6485, 6490, 6511, 6512, 6515, 6520, 6525, 6530, 6550
Non-Metallic 3	7220, 7240, 7280, 7350, 7375, 7410, 7420, 7450, 7520, 7530, 7535, 7540, 7545, 7547, 7550, 7560, 7570, 7580, 7620, 7630, 7640, 7660, 7690
Non-Metallic 4	7035, 7037, 7040, 7050, 7060, 7065, 7100, 7130, 7140, 7150, 7160, 7170, 7180, 7190, 7210, 7230, 7245, 7250, 7260, 7290, 7300, 7310, 7315, 7320, 7330, 7370, 7380, 7390, 7430, 7480, 7490, 7500, 7510, 7610, 7615
Non-Metallic 5	7080, 7183, 7185, 7187
Chemicals 1, 2	8080, 8380
Chemicals 4	8020, 8030, 8050, 8060, 8090, 8100, 8120, 8130, 8140, 8220, 8225, 8230, 8240, 8250, 8260, 8270, 8280, 8320, 8330, 8340, 8350, 8355, 8360, 8385, 8387, 8390, 8400, 8410, 8440, 8444, 8455, 8457, 8465, 8470, 8471-8473, 8475, 8481, 8490
Chemicals 5	8103, 8105, 8108, 8110, 8285, 8290, 8295, 8297, 8300, 8305, 8310, 8445, 8460
Miscellaneous 1,2	9260
Miscellaneous 3	9510, 9520
Miscellaneous 4	9500
Miscellaneous 5	9020, 9030, 9035, 9040, 9050, 9055, 9060, 9100, 9110, 9120, 9130, 9140, 9150, 9160, 9170, 9175, 9177, 9180, 9190, 9200, 9210, 9220, 9230, 9235, 9240, 9250, 9280, 9290, 9300, 9310, 9320, 9330, 9335, 9341, 9342, 9345, 9350, 9355, 9360, 9380, 9390, 9400, 9410, 9415, 9417, 9425, 9430, 9440, 9460, 9480, 9535, 9555, 9540, 9557

TABLE A.X Disaggregated Import Series, 1960-1972.
Code Numbers, 1948 and 1968 Weights

Series	Weights (%)		Code Numbers
	1948	1968	
Vegetables	0.32	8.96	9103-9199
Sugar	2.78	8.37	10115, 10119
Cocoa	0.80	2.19	11110
Coffee	1.25	12.99	11210
Tea	0.86	4.17	11310
Fresh Fruits	1.84	18.72	7103-7189
Indian Corn	0.85	7.22	6129
Meat	-	7.07	1104-1399
Live Animals	0.07	100.00	110-999
Soyabeans	0.50	3.27	21260
Furs	1.18	-	20220-20289
Cotton, Raw	3.39	5.25	24410
Wool, Raw	1.35	0.81	24209, 24219
Wool, Tops	1.43	1.75	24259, 24268
Synthetics 3	0.74	-	24617-24699
Iron Ore	0.59	5.11	25120-25199
Coal Anthr.	2.65	-	26105-26115
Coal Bitum.	6.00	16.23	26149
Petroleum	9.03	39.16	26410
Rubber 3	1.44	1.72	21610-21649
Hides	0.17	0.90	20110
Bauxite	0.64	8.61	25210-25299
Copper Ores	-	5.02	25339, 25399
Vegetable Oils	0.81	-	39308-39399
Cotton, Fabrics	1.27	4.97	37302-37398
Jute	1.04	1.07	37404-37449
Worsteds	1.91	1.30	37203-37259
Paperboard 4	1.20	-	35181-35999
Rolling Mill	1.41	7.01	44403-44690, 44739-44799
Tin, Blocks	0.51	1.31	45608

TABLE A.X (Continued)

Glass	0.53	-	47303-47318
Gasoline	1.91	1.39	43109-43149
Fertilizers	0.36	-	41623-41699
Ind. Chemicals 4	0.92	18.08	42907-42999
Coated, Fabrics	-	1.23	38702-38795
Veneers	-	1.48	33507-33599/33707-33899
Heavy Fuels	-	4.78	43259
Inorg. Chemicals	-	0.86	40000-40599
Org. Chemicals	-	1.29	40600-41399
Farm Machinery	5.33	0.84	54000-55199
Machinery	8.26	-	50000-52999
Automobiles	5.80	50.21	58000-58999
Electric	3.18	6.45	63419-63999, 65506-65599, 68000-68995
Drilling Machinery	-	3.91	52101-52199
Section 2	10.78	100.00	1104-18399
Section 3	32.82	100.00	20110-29199
Section 4	26.79	100.00	30110-49704
Section 5	29.54	100.00	50119-96199

TABLE A.XI Disaggregated Export Series, 1960-1972 . Code Numbers, 1948 and 1968 Weights

Series	Weights (%) 1948	1968	Code Numbers
Wheat	10.12	51.72	6161-6169
Barley	1.13	3.26	6119
Whisky	1.13	12.87	17340
Wheat Flower	5.21	4.55	6267, 6269
Oats	0.93	-	6131, 6133, 6139
Tobacco	0.30	4.36	18005-18399
Beef	1.52	1.25	1109/1104, 1105, 1107, 1108
Milk	0.35	-	5150-5199
Eggs	1.01	-	5319/5935
Cheese	0.50	1.27	5130, 5139/5114, 5149
Fish	1.91	11.79	3106-4999
Live Animals	2.80	100.00	110-999
Furs	0.76	1.16	20203-20289
Hides	0.35	0.76	20110
Pulpwood	1.58	0.96	23624-23699
Iron Ores	0.48	20.35	25104-25119
Nickel 3	-	11.88	25520, 25530, 25540
Platinum	0.58	1.74	25629, 25639
Asbestos	1.20	5.99	27110-27140
Petroleum	-	20.90	26410
Natural Gas	-	7.20	26431
Coal	0.53	-	26169, 26189
Leather	0.26	-	30012-30099
Newsprint	13.85	25.91	35109
Woodpulp	7.50	15.72	34019-34099
Planks	6.74	14.66	33106-33195
Shingles	0.80	-	33403-33405
Plywood	0.43	-	33544-33579

TABLE A.XI (Continued)

Pig Iron	0.32	0.71	44219
Copper	1.85	7.56	45204-45214
Aluminum	3.08	10.87	45109-45149
Nickel	1.56	6.15	45415-45499
Zinc	1.28	1.97	45708
Abrasives	0.64	0.89	47619-47699
Fertilizers	1.19	-	41644-41699
Rolling Mill	0.58	2.29	44430-44599
Electricitiy	0.15	0.37	49075/49697/49704
Chemicals	-	5.13	40003-41499
Farm Machinery	4.71	4.07	54109-55199
Machinery	0.63	10.28	50019-53010
Automobiles	3.51	76.34	58019-58099/58110-58999
Cons. Goods	2.36	1.50	78009-78099/78149-78999 and 63035-63060/63070-63079/63720-63799
Rubber	0.65	0.33	62005-62039/62105-62549
Section 2	28.97	100.00	1104-18399
Section 3	8.55	100.00	20110-29199
Section 4	45.43	100.00	30010-49704
Section 5	14.25	100.00	50239-96099

TABLE A.XII DISAGGREGATED VALUE AND PRICE SERIES, IMPORTS 1948-1972
1. SUBPERIOD 1948-1960

YEAR	PRICE	QUANTITY	PRICE	QUANTITY
	BANANAS		CITRUS FRUITS	
1948	1.000	17199.000	1.000	18837.000
1949	1.189	14326.325	1.430	15571.329
1950	1.280	15189.062	1.613	15208.927
1951	1.246	15728.732	1.475	18101.017
1952	1.189	17610.597	1.315	20313.308
1953	1.218	18752.053	1.234	21479.741
1954	1.246	18470.305	1.473	21230.143
1955	1.250	18447.200	1.434	20852.859
1956	1.219	19214.110	1.601	20359.775
1957	1.227	19880.196	1.607	20450.529
1958	1.171	20215.201	2.125	16968.471
1959	1.152	21167.535	1.679	21033.949
1960	1.034	23643.133	1.841	19841.391
	FRUITS, DRIED		NUTS	
1948	1.000	10373.000	1.000	31027.000
1949	1.051	9172.217	1.056	21957.386
1950	1.151	10319.722	.784	28536.990
1951	1.302	9794.931	.838	27183.771
1952	1.155	11213.853	.826	25518.160
1953	1.206	10436.982	.815	24600.000
1954	1.247	10469.928	.833	27132.053
1955	1.263	11154.394	.768	24410.156
1956	1.265	9773.913	.767	27288.136
1957	1.324	10032.477	.738	29323.848
1958	1.559	10688.262	.750	25757.333
1959	1.569	10982.154	.664	30509.036
1960	1.567	10341.417	.763	28714.286
	VEGETABLES		SUGAR	
1948	1.000	6845.000	1.000	63061.000
1949	.941	19617.428	1.049	63037.178
1950	.772	30128.238	1.194	64663.317
1951	1.066	24666.979	1.397	55189.692
1952	1.175	32314.043	.990	60147.475
1953	.769	38036.411	.822	57774.939
1954	.772	45090.674	.777	66305.019
1955	.903	45545.958	.765	68381.699
1956	.900	53142.222	.769	72598.179
1957	.934	47297.645	1.105	68445.249
1958	1.006	46392.644	.792	73962.121
1959	.925	50449.730	.737	77082.768
1960	.947	55192.186	.737	68761.194

TABLE A.XII (CONTINUED)

	COCOA		COFFEE	
1948	1.000	14790.000	1.000	23426.000
1949	.660	15421.212	1.074	26614.525
1950	.714	15009.804	1.884	22114.650
1951	.963	9867.082	2.052	23605.263
1952	.886	10787.810	1.948	26065.195
1953	.797	12328.733	2.007	28697.060
1954	1.379	11323.423	2.521	25471.638
1955	1.106	10473.779	2.056	27728.599
1956	.708	10566.384	2.142	29251.634
1957	.617	11306.321	2.004	29500.998
1958	1.121	9161.463	1.749	31590.623
1959	.919	10515.778	1.404	35844.729
1960	.713	12767.181	1.345	35177.695

	TEA		WHISKY	
1948	1.000	17520.000	1.000	8093.000
1949	1.014	20835.306	1.004	10750.996
1950	1.056	26802.083	.995	9240.201
1951	1.003	20783.649	.964	10220.954
1952	.829	22541.616	.941	11965.994
1953	.866	22789.838	.951	10597.266
1954	1.041	22652.257	.968	9252.066
1955	1.184	21607.264	.962	9402.287
1956	1.085	22727.189	.984	9148.374
1957	1.042	23214.012	.942	10063.694
1958	1.023	22307.918	.928	9952.586
1959	1.009	22789.891	.907	8745.314
1960	1.072	21903.918	.905	8459.669

	IND. CHEMICALS 12		AGR.+ANIM. 12	
1948	1.000	2.000	1.000	93003.000
1949	.971	8.239	.948	102533.755
1950	1.146	41.885	1.006	124746.521
1951	1.218	25.452	1.188	137117.003
1952	1.103	14.506	.979	151273.749
1953	1.109	15.329	.940	170206.383
1954	1.109	19.838	.961	186418.314
1955	1.124	4.448	.922	208823.210
1956	1.150	7.826	.937	254394.877
1957	1.143	4.374	.954	267832.285
1958	1.160	12.931	.924	297311.688
1959	1.148	11.324	.860	337416.279
1960	1.165	6.009	.852	349253.521

TABLE A.XII (CONTINUED)

	NON-METALLIC 12		CHEMICALS 12	
1948	1.000	+0.0	1.000	1344.000
1949	1.009	+0.0	1.005	1574.129
1950	1.034	+0.0	1.019	774.289
1951	1.084	.923	1.195	573.222
1952	1.011	2.967	1.108	514.440
1953	1.050	1.905	1.113	486.972
1954	1.038	7.707	1.092	617.216
1955	1.016	19.685	1.109	527.502
1956	1.014	27.613	1.120	483.036
1957	1.073	33.551	1.106	510.850
1958	1.060	32.075	1.125	480.000
1959	1.027	61.344	1.104	563.406
1960	.986	56.795	1.112	612.410

	MISCELLANEOUS 12		SOYABEANS	
1948	1.000	57.000	1.000	4937.000
1949	.994	62.374	.747	7314.592
1950	1.196	72.742	.888	13670.045
1951	1.577	65.314	1.033	15912.875
1952	1.214	114.498	.877	15997.719
1953	1.117	152.193	.828	15646.135
1954	1.062	207.156	.895	23461.453
1955	1.158	215.889	.716	27178.771
1956	1.153	262.793	.727	33530.949
1957	1.111	284.428	.669	35466.368
1958	1.063	383.819	.633	37033.175
1959	1.135	444.053	.625	44892.800
1960	1.219	508.614	.622	51774.920

	FURS		COTTON, RAW	
1948	1.000	21980.000	1.000	55546.000
1949	.746	21841.823	.970	67707.216
1950	.753	24916.335	1.176	75221.939
1951	.868	20141.705	1.395	67609.319
1952	.669	29563.528	1.207	54644.573
1953	.674	24489.614	1.052	52750.951
1954	.610	24516.393	1.046	50134.799
1955	.808	24882.426	1.052	58014.259
1956	.781	24623.560	.927	63374.326
1957	.750	27910.667	.869	56947.066
1958	.692	29815.029	.885	51317.514
1959	.680	30702.941	.830	51902.410
1960	.714	26701.681	.770	56320.779

TABLE A.XII (CONTINUED)

	WOOL, RAW		WOOL, TOPS	
1948	1.000	23636.000	1.000	23471.000
1949	1.044	18054.598	1.082	16421.442
1950	1.366	19623.719	1.284	21474.299
1951	3.237	16793.636	2.149	18022.336
1952	1.302	13864.823	1.037	9954.677
1953	1.476	15128.726	1.149	17158.399
1954	1.536	9582.682	1.119	11800.715
1955	1.427	12880.168	.978	14520.450
1956	1.379	14828.861	.948	14343.882
1957	1.465	10935.836	1.104	13884.964
1958	1.188	8773.569	.873	13209.622
1959	.967	12064.116	.843	15664.294
1960	1.133	11172.992	.873	15150.057

	SISAL		SYNTHETICS 3	
1948	1.000	11043.000	1.000	3414.000
1949	1.095	5779.909	.994	3722.334
1950	.957	8606.061	1.011	2722.057
1951	1.493	12393.168	1.264	8077.532
1952	1.403	12132.573	1.117	3773.500
1953	.763	6904.325	.999	4059.059
1954	.642	8646.417	1.000	3553.000
1955	.587	9921.635	.987	6915.907
1956	.606	10028.053	.967	7504.654
1957	.519	11423.892	.961	9952.133
1958	.498	9397.590	1.001	4427.572
1959	.544	11454.044	1.004	5826.693
1960	.683	8929.722	1.032	5354.651

	PAPERBOARD 3		IRON ORE	
1948	1.000	1189.000	1.000	15507.000
1949	1.043	513.902	1.327	9085.908
1950	1.120	1387.500	1.498	11215.621
1951	1.142	2904.553	1.640	13823.780
1952	1.042	826.296	1.670	15879.641
1953	1.034	933.269	1.898	14854.584
1954	1.031	1081.474	1.885	10830.769
1955	1.053	1697.056	1.926	16387.850
1956	1.127	1908.607	2.036	19018.664
1957	1.132	1132.509	2.087	17435.074
1958	1.158	1447.323	2.136	13544.944
1959	1.147	1401.046	2.069	13112.131
1960	1.177	1027.188	2.062	23457.808

TABLE A.XII (CONTINUED)

	COAL, ANTH.		COAL, BITUM.	
1948	1.000	56292.000	1.000	127673.000
1949	1.072	42535.448	1.032	90557.171
1950	1.169	46420.017	1.047	113455.587
1951	1.237	41421.180	1.004	114815.737
1952	1.185	41713.080	.949	104922.023
1953	1.260	31808.730	.939	100830.671
1954	1.124	29487.544	.893	78885.778
1955	1.076	27996.283	.880	84605.682
1956	1.114	26836.625	.968	99706.612
1957	1.214	20234.761	1.045	86786.603
1958	1.155	16527.273	1.051	63812.559
1959	1.084	16122.694	1.039	62670.837
1960	1.029	12833.819	1.020	60608.824

	PETROLEUM		RUBBER 3	
1948	1.000	191980.000	1.000	18404.000
1949	1.006	188234.592	.858	17427.739
1950	1.002	200105.788	1.585	19591.167
1951	1.090	211959.633	2.973	20448.369
1952	1.002	206425.150	1.661	15402.769
1953	1.030	201928.155	1.208	18408.940
1954	1.061	200278.982	1.085	18543.779
1955	1.042	220230.326	1.710	21250.292
1956	1.001	270611.389	1.632	19742.647
1957	1.074	284503.724	1.472	18295.516
1958	1.036	264428.571	1.220	16136.885
1959	.949	292407.798	1.595	19361.129
1960	.878	318987.472	1.849	15027.582

	AGR.+ANIM. 3		TEXTILES 3	
1948	1.000	22130.000	1.000	11664.000
1949	.948	31814.346	1.007	12873.883
1950	1.006	34584.493	1.091	15582.035
1951	1.188	33440.236	1.558	16297.176
1952	.979	23707.865	1.070	14140.187
1953	.940	24806.383	1.001	13577.423
1954	.961	21891.779	.998	12113.226
1955	.922	28866.594	.953	14444.911
1956	.937	36758.805	.893	15631.579
1957	.954	33068.134	.908	14386.564
1958	.924	33134.199	.869	12948.216
1959	.860	41298.837	.831	13575.211
1960	.852	39334.507	.856	12674.065

TABLE A.XII (CONTINUED)

	WOOD 3		IRON 3	
1948	1.000	3742.000	1.000	10454.000
1949	1.059	3093.484	1.065	7433.803
1950	1.118	3311.270	1.168	4621.575
1951	1.199	5522.102	1.234	3123.987
1952	1.139	4303.775	1.179	5801.527
1953	1.161	5422.911	1.225	2839.184
1954	1.160	5739.655	1.236	1656.958
1955	1.178	8182.513	1.298	11060.092
1956	1.225	12091.429	1.403	25872.416
1957	1.242	9869.565	1.477	13133.378
1958	1.353	7493.718	1.513	5782.551
1959	1.361	8671.565	1.519	15670.178
1960	1.383	10930.586	1.532	12139.687

	NON-FERROUS 3		NON-METALLIC 3	
1948	1.000	21792.000	1.000	25733.000
1949	1.064	21482.143	1.009	24071.358
1950	1.088	25306.985	1.034	26361.702
1951	1.223	33863.451	1.084	28100.554
1952	1.200	38929.167	1.011	33435.213
1953	1.190	24780.672	1.050	33743.810
1954	1.202	22062.396	1.038	27245.665
1955	1.256	28893.312	1.016	32830.709
1956	1.345	35953.160	1.014	38964.497
1957	1.289	52195.500	1.073	40757.689
1958	1.289	30908.456	1.060	40574.528
1959	1.321	35728.236	1.027	34376.826
1960	1.363	40862.069	.986	34421.907

	CHEMICALS 3		MISCELLANEOUS 3	
1948	1.000	33.000	1.000	270.000
1949	1.005	41.791	.994	189.135
1950	1.019	27.478	1.196	229.933
1951	1.195	41.841	1.577	196.576
1952	1.108	41.516	1.214	119.440
1953	1.113	23.360	1.117	68.935
1954	1.092	71.429	1.062	62.147
1955	1.109	10.821	1.158	72.539
1956	1.120	9.821	1.153	95.403
1957	1.106	16.275	1.111	169.217
1958	1.125	7.111	1.063	114.770
1959	1.104	19.928	1.135	144.493
1960	1.112	6.295	1.219	175.554

TABLE A.XII (CONTINUED)

	VEGET. OILS		COTTON, FABRICS	
1948	1.000	20912.000	1.000	52819.000
1949	.951	25037.855	.818	64383.863
1950	.865	39593.064	.872	52638.761
1951	1.126	34591.474	.964	57037.344
1952	.736	30539.402	.810	65738.272
1953	.714	36504.202	.726	77005.510
1954	.670	39501.493	.661	69609.682
1955	.631	40405.705	.711	75105.485
1956	.722	36663.435	.709	87630.465
1957	.679	38329.897	.690	94273.913
1958	.601	50497.504	.639	103549.296
1959	.574	50770.035	.645	108617.054
1960	.605	44968.595	.675	111333.333

	JUTE		WORSTEDS	
1948	1.000	17203.000	1.000	31239.000
1949	.933	12056.806	1.094	30968.007
1950	.940	15606.383	.949	26080.084
1951	1.411	12749.823	1.217	25690.222
1952	.848	17627.358	1.014	24092.702
1953	.609	18522.167	.989	31772.497
1954	.596	16719.799	1.023	22471.163
1955	.563	20174.067	.940	22227.660
1956	.523	21007.648	.826	31474.576
1957	.550	19543.636	.826	30104.116
1958	.543	20373.849	.972	22985.597
1959	.563	21488.455	.917	23654.308
1960	.623	18727.127	.949	22782.929

	SYNTHETICS 4		PAPERBOARD 4	
1948	1.000	13870.000	1.000	12443.000
1949	.994	14197.183	1.043	14934.803
1950	1.011	7391.691	1.120	15316.071
1951	1.264	8348.101	1.142	21556.042
1952	1.117	16005.372	1.042	20993.282
1953	.999	19906.907	1.034	28067.698
1954	1.000	19237.000	1.031	31002.910
1955	.987	22710.233	1.053	36479.582
1956	.967	24374.354	1.127	39951.198
1957	.961	26365.245	1.132	40763.251
1958	1.001	26868.132	1.158	42133.851
1959	1.004	27815.737	1.147	44163.034
1960	1.032	26603.682	1.177	43022.090

TABLE A.XII (CONTINUED)

	ROLLING MILL		TIN, BLOCKS	
1948	1.000	83929.000	1.000	7898.000
1949	1.077	91079.851	.967	8130.300
1950	1.198	78162.771	.970	10656.701
1951	1.393	124283.561	1.443	13566.875
1952	1.254	114141.148	1.222	8670.213
1953	1.274	97969.388	1.017	8125.860
1954	1.274	76580.063	.884	8418.552
1955	1.383	93766.450	.930	9477.419
1956	1.488	157734.543	.988	8293.522
1957	1.581	138575.585	.936	9122.863
1958	1.603	92009.357	.929	7599.569
1959	1.567	87639.438	1.000	9182.000
1960	1.641	82119.439	.998	8274.549

	BRICKS		GLASS	
1948	1.000	9660.000	1.000	11232.000
1949	1.045	9822.967	1.051	9717.412
1950	1.151	9868.810	1.202	9411.814
1951	1.214	13817.957	1.376	9183.140
1952	1.126	13983.126	1.282	7522.621
1953	1.179	13910.941	1.343	11008.191
1954	1.221	10389.844	1.390	8802.878
1955	1.293	13293.117	1.434	12675.732
1956	1.369	15915.997	1.496	14470.588
1957	1.390	13900.719	1.492	11489.276
1958	1.432	11097.067	1.509	13356.528
1959	1.451	13128.877	1.487	17406.859
1960	1.483	12720.162	1.480	13700.000

	GAS		FERTILIZERS	
1948	1.000	87562.000	1.000	6298.000
1949	.933	71176.849	1.024	7585.937
1950	1.043	83490.892	1.081	8133.210
1951	1.048	89193.702	1.053	9719.848
1952	.985	108986.802	1.053	9938.272
1953	1.056	109932.765	1.076	11142.193
1954	.880	121817.045	1.098	10837.887
1955	.888	129427.928	1.126	11274.423
1956	.914	130574.398	1.171	11321.947
1957	.943	122452.810	1.186	11489.882
1958	.909	105936.194	1.155	11233.766
1959	.875	126202.286	1.153	11102.342
1960	.986	85733.266	1.166	12199.828

TABLE A.XII (CONTINUED)

	PAINT 4		IND. CHEMICALS 4	
1948	1.000	14051.000	1.000	23827.000
1949	.982	13900.204	.971	23884.655
1950	.953	18824.764	1.146	25612.565
1951	1.057	19459.792	1.218	29010.673
1952	.989	17001.011	1.103	29399.819
1953	.978	21069.530	1.109	35436.429
1954	.983	19805.697	1.109	37963.931
1955	1.005	22547.264	1.124	43121.886
1956	1.039	23889.317	1.150	44049.565
1957	1.058	21158.790	1.143	32757.655
1958	1.098	18704.007	1.160	27989.655
1959	1.080	20859.259	1.148	29154.181
1960	1.097	18797.630	1.165	29449.785

	RUBBER 4		AGR.+ANIM. 4	
1948	1.000	10246.000	1.000	24004.000
1949	.858	13335.664	.948	18159.283
1950	1.585	9151.420	1.006	22842.942
1951	2.973	5936.091	1.188	23112.795
1952	1.661	9532.210	.979	19241.062
1953	1.208	14784.768	.940	23331.915
1954	1.085	15573.272	.961	21496.358
1955	1.710	14356.140	.922	27415.401
1956	1.632	16825.368	.937	26728.922
1957	1.472	20098.505	.954	27538.784
1958	1.220	23028.689	.924	29097.403
1959	1.595	24914.107	.860	33505.814
1960	1.849	18315.306	.852	32393.192

	TEXTILES 4		WOOD 4	
1948	1.000	67269.000	1.000	19791.000
1949	1.007	57757.696	1.059	22871.577
1950	1.091	54120.073	1.118	24833.631
1951	1.558	48387.035	1.199	33018.349
1952	1.070	60871.028	1.139	33820.896
1953	1.001	77464.535	1.161	34878.553
1954	.998	66599.198	1.160	35464.655
1955	.953	81901.364	1.178	44487.267
1956	.893	98410.974	1.225	52604.898
1957	.908	94438.326	1.242	45900.161
1958	.869	97729.574	1.353	44327.421
1959	.831	112341.757	1.361	59924.320
1960	.856	110825.935	1.383	48015.184

TABLE A.XII (CONTINUED)

	IRON 4		NON-FERROUS 4	
1948	1.000	64775.000	1.000	42226.000
1949	1.065	73819.718	1.064	43482.143
1950	1.168	69580.479	1.088	55088.235
1951	1.234	99597.245	1.223	57501.226
1952	1.179	116492.791	1.200	56699.167
1953	1.225	106245.714	1.190	71430.252
1954	1.236	104155.340	1.202	62091.514
1955	1.298	102442.219	1.256	67915.605
1956	1.403	163323.592	1.345	96031.970
1957	1.477	170681.110	1.289	86730.023
1958	1.513	120940.516	1.289	76568.658
1959	1.519	105578.012	1.321	72695.685
1960	1.532	96535.901	1.363	72460.015

	NON-METALLIC 4		CHEMICALS 4	
1948	1.000	69640.000	1.000	59471.000
1949	1.009	67250.743	1.005	68970.149
1950	1.034	70115.087	1.019	82476.938
1951	1.084	92074.723	1.195	86010.879
1952	1.011	89537.092	1.108	93059.567
1953	1.050	94071.429	1.113	107230.009
1954	1.038	85733.141	1.092	104014.652
1955	1.016	106023.622	1.109	126864.743
1956	1.014	121274.162	1.120	141807.143
1957	1.073	110723.206	1.106	158327.306
1958	1.060	95317.925	1.125	155394.667
1959	1.027	104535.540	1.104	183290.761
1960	.986	110324.544	1.112	192208.633

	MISCELLANEOUS 4		NEWSPAPERS	
1948	1.000	2901.000	1.000	16413.000
1949	.994	4127.767	1.068	17013.109
1950	1.196	3239.967	1.107	19131.888
1951	1.577	3168.675	1.192	22832.215
1952	1.214	3952.224	1.305	23471.264
1953	1.117	5259.624	1.342	26964.978
1954	1.062	5249.529	1.365	26980.220
1955	1.158	4942.142	1.384	26899.566
1956	1.153	5895.056	1.389	26596.112
1957	1.111	7085.509	1.441	27623.178
1958	1.063	6442.145	1.714	23025.671
1959	1.135	7206.167	1.750	23749.714
1960	1.219	5724.364	1.779	23223.721

TABLE A.XII (CONTINUED)

	PAPERBOARD 5		FARM MACHINERY	
1948	1.000	3580.000	1.000	139992.000
1949	1.043	3791.946	1.080	164084.259
1950	1.120	4219.643	1.166	138629.503
1951	1.142	6039.405	1.231	158474.411
1952	1.042	6895.393	1.166	169181.818
1953	1.034	8917.795	1.178	177540.747
1954	1.031	10163.919	1.168	122571.918
1955	1.053	11861.349	1.183	150673.711
1956	1.127	13346.051	1.224	189663.399
1957	1.132	13094.523	1.245	162433.735
1958	1.158	13184.801	1.315	150792.395
1959	1.147	13959.024	1.346	203433.135
1960	1.177	14497.026	1.383	165335.503

	MACHINERY		AUTOMOBILES	
1948	1.000	217090.000	1.000	151318.000
1949	1.057	204650.899	1.059	177588.291
1950	1.136	199162.852	1.138	242960.457
1951	1.208	272136.589	1.148	267135.017
1952	1.144	315532.343	1.142	257826.620
1953	1.166	344644.940	1.149	315170.583
1954	1.183	321402.367	1.134	256967.372
1955	1.230	362500.000	1.180	348041.525
1956	1.317	477236.902	1.240	417063.710
1957	1.368	461695.175	1.266	354827.804
1958	1.418	375822.285	1.324	341771.903
1959	1.428	409828.431	1.345	426736.059
1960	1.465	395761.775	1.340	446061.940

	ELECTRIC		CHINA	
1948	1.000	62127.000	1.000	12489.000
1949	1.047	66668.577	1.092	12242.674
1950	1.046	78933.078	.990	12800.000
1951	1.153	104163.920	1.086	13979.742
1952	1.213	115059.357	1.052	11827.947
1953	1.239	160028.249	1.059	12147.309
1954	1.259	164844.321	1.076	11948.885
1955	1.283	176706.937	1.130	11774.336
1956	1.349	190727.947	1.181	11756.986
1957	1.421	175459.536	1.150	11220.000
1958	1.471	163230.455	1.204	11776.578
1959	1.468	183516.349	1.228	11299.674
1960	1.484	175520.889	1.269	10479.905

TABLE A.XII (CONTINUED)

	PAINT 5		IND. CHEMICALS 5	
1948	1.000	226.000	1.000	72.000
1949	.982	220.978	.971	71.061
1950	.953	284.365	1.146	114.311
1951	1.057	276.254	1.218	160.099
1952	.989	404.449	1.103	274.705
1953	.978	606.339	1.109	542.831
1954	.983	661.241	1.109	445.446
1955	1.005	572.139	1.124	645.018
1956	1.039	650.626	1.150	401.739
1957	1.058	675.803	1.143	326.334
1958	1.098	720.401	1.160	379.310
1959	1.080	977.778	1.148	438.153
1960	1.097	992.707	1.165	536.481

	CONS. GOODS		RUBBER 5	
1948	1.000	24693.000	1.000	2956.000
1949	.986	31573.022	.858	3059.441
1950	1.033	42444.337	1.585	1969.716
1951	1.103	61165.005	2.973	2047.763
1952	1.020	82076.471	1.661	6452.739
1953	1.013	104630.800	1.208	8668.046
1954	.995	92129.648	1.085	8038.710
1955	.993	103124.874	1.710	8244.444
1956	.988	113500.000	1.632	10650.735
1957	.976	108473.361	1.472	10118.886
1958	.986	112784.990	1.220	14363.934
1959	.971	121338.826	1.595	14121.630
1960	.992	108308.468	1.849	12473.229

	AGR.+ANIM. 5		TEXTILES 5	
1948	1.000	4878.000	1.000	39445.000
1949	.948	5196.203	1.007	37416.087
1950	1.006	5743.539	1.091	38350.137
1951	1.188	5773.569	1.558	33268.293
1952	.979	6835.546	1.070	49631.776
1953	.940	9892.553	1.001	70553.447
1954	.961	8388.137	.998	67232.465
1955	.922	9050.976	.953	79187.828
1956	.937	9784.418	.893	96008.959
1957	.954	10125.786	.908	96373.348
1958	.924	12049.784	.869	101527.043
1959	.860	15519.767	.831	124801.444
1960	.852	15852.113	.856	122080.607

TABLE A.XII (CONTINUED)

	WOOD 5		IRON 5	
1948	1.000	16572.000	1.000	99190.000
1949	1.059	19444.759	1.065	106359.624
1950	1.118	21723.614	1.168	101661.815
1951	1.199	24011.676	1.234	145219.611
1952	1.139	26847.234	1.179	203661.578
1953	1.161	33390.181	1.225	221869.388
1954	1.160	32601.724	1.236	209506.472
1955	1.178	37347.199	1.298	202302.773
1956	1.225	40649.796	1.403	224271.561
1957	1.242	43935.588	1.477	217345.972
1958	1.353	44562.454	1.513	198483.146
1959	1.361	50756.796	1.519	204371.955
1960	1.383	53779.465	1.532	189637.728

	NON-FERROUS 5		NON-METALLIC 5	
1948	1.000	21757.000	1.000	13921.000
1949	1.064	26210.526	1.009	14383.548
1950	1.088	32286.765	1.034	15473.888
1951	1.223	32228.945	1.084	17202.030
1952	1.200	26620.833	1.011	16354.105
1953	1.190	36546.218	1.050	20366.667
1954	1.202	34094.842	1.038	20108.863
1955	1.256	33139.331	1.016	24536.417
1956	1.345	36037.175	1.014	29092.702
1957	1.289	37155.159	1.073	27429.637
1958	1.289	36031.808	1.060	30329.245
1959	1.321	37403.482	1.027	32673.807
1960	1.363	35157.740	.986	34708.925

	CHEMICALS 5		MISCELLANEOUS 5	
1948	1.000	13056.000	1.000	38314.000
1949	1.005	14743.284	.994	49421.529
1950	1.019	16512.267	1.196	42423.913
1951	1.195	18106.276	1.577	59362.080
1952	1.108	21264.440	1.214	127460.461
1953	1.113	25887.691	1.117	158630.260
1954	1.092	28784.799	1.062	158308.851
1955	1.109	30730.388	1.158	185767.703
1956	1.120	35113.393	1.153	156753.686
1957	1.106	39403.255	1.111	167502.250
1958	1.125	42457.778	1.063	179937.912
1959	1.104	48568.841	1.135	161901.322
1960	1.112	47978.417	1.219	189198.523

TABLE A.XII (CONTINUED)
2. SUBPERIOD 1960-1968

YEAR	PRICE	QUANTITY	PRICE	QUANTITY
	FRESH FRUITS		VEGETABLES	
1960	1.433	64914.166	.947	52545.935
1961	1.547	63329.670	.944	50850.636
1962	1.649	60335.355	1.313	46391.470
1963	1.916	53576.722	1.066	51106.942
1964	1.873	61129.738	1.078	55756.030
1965	1.759	67785.105	1.313	51513.328
1966	1.697	71630.524	1.369	54712.199
1967	1.673	77245.666	1.216	63045.230
	SUGAR, RAW		COCOA BEANS	
1960	.737	68761.194	.713	12767.181
1961	.690	76418.841	.590	13254.237
1962	.676	84210.059	.590	13589.831
1963	1.532	82725.196	.637	12610.675
1964	1.314	77525.875	.666	14779.279
1965	.589	93606.112	.493	19267.748
1966	.522	85963.602	.592	13929.054
1967	.565	84203.540	.700	14708.571
	COFFEE		TEA	
1960	1.345	35177.695	1.072	21903.918
1961	1.322	39473.525	1.056	22565.341
1962	1.281	43446.526	1.070	20776.636
1963	1.296	45452.932	1.098	22653.005
1964	1.704	43992.371	1.148	22097.561
1965	1.625	44387.077	1.130	22079.646
1966	1.581	41035.421	1.036	21697.876
1967	1.468	47461.172	1.012	22844.862
	INDIAN CORN		LIVE ANIMALS	
1960	.661	26639.939	.571	13416.813
1961	.684	40062.865	.623	11709.470
1962	.719	60504.868	.696	11304.598
1963	.795	40586.164	.696	13897.989
1964	.801	37483.146	.629	27224.165
1965	.819	33930.403	.671	16096.870
1966	.865	36478.613	.757	17054.161
1967	1.197	35212.197	.757	28923.382

TABLE A.XII (CONTINUED)

	RES. SECTION 12		SOYABEANS	
1960	1.006	281933.400	.622	51774.920
1961	1.056	295047.348	.771	39249.027
1962	1.077	287664.810	.786	47506.361
1963	1.081	335365.402	.849	48402.827
1964	1.074	336059.590	.847	62454.545
1965	1.081	353856.614	.854	54247.073
1966	1.090	388306.422	.970	54059.794
1967	1.005	460586.070	.873	55054.983

	FURS		HIDES	
1960	.714	26701.681	.591	6245.347
1961	.727	24990.371	.649	10468.413
1962	.747	24566.265	.667	9361.319
1963	.998	21180.361	.483	9134.576
1964	.944	20943.856	.461	10336.226
1965	.922	22481.562	.556	9875.899
1966	1.059	19233.239	.834	12360.911
1967	.807	21840.149	.627	11834.131

	COTTON, RAW		WOOL, RAW	
1960	.770	56320.779	1.133	9862.312
1961	.800	59141.250	1.054	11346.300
1962	.866	62740.185	1.119	10862.377
1963	.845	60618.935	1.243	9428.801
1964	.836	71843.301	1.549	10947.063
1965	.851	75266.745	1.238	11240.711
1966	.790	57751.899	1.205	11317.842
1967	.793	74871.375	1.096	9899.635

	WOOL, TOPS		SYNTHETICS	
1960	.873	15150.057	1.032	5354.651
1961	.896	16529.018	1.043	6446.788
1962	.963	18470.405	1.064	7806.391
1963	1.090	22691.743	1.064	6582.707
1964	1.164	21382.302	1.089	11187.328
1965	1.007	23604.767	1.100	20809.091
1966	1.015	21154.680	1.118	16147.585
1967	.978	19385.481	1.102	18647.005

TABLE A.XII (CONTINUED)

	IRON ORE		BAUXITE+ALUM.	
1960	2.062	32477.207	1.117	40514.772
1961	2.143	27613.626	1.231	47221.771
1962	2.123	32474.329	1.445	43098.270
1963	2.165	39868.360	1.145	58645.415
1964	2.111	44872.099	1.152	61131.944
1965	2.117	45659.424	1.186	58913.153
1966	2.136	36036.985	1.205	63587.552
1967	2.141	22425.969	1.231	60590.577

	COAL, ANTH.		COAL, BITUM.	
1960	1.029	12833.819	1.020	61997.059
1961	1.089	10046.832	1.055	56848.341
1962	1.141	8883.436	1.077	59119.777
1963	1.225	8204.082	1.079	63269.694
1964	1.281	6227.166	1.077	72610.956
1965	1.218	6317.734	1.462	80861.149
1966	1.157	5831.461	1.669	80310.965
1967	1.174	5183.986	1.759	79056.282

	PETROLEUM		RUBBER	
1960	.878	318987.472	1.849	14861.547
1961	.862	337784.223	1.344	13622.024
1962	.894	341049.217	1.371	16100.656
1963	.894	374453.020	1.323	16204.082
1964	.878	365190.205	1.242	18276.167
1965	.854	365642.857	1.113	19576.819
1966	.807	370509.294	1.172	21244.027
1967	.819	433963.370	.989	19677.452

	RES. SECTION 3		VEGET. OILS	
1960	.961	125640.999	.605	33540.496
1961	.969	133197.110	.711	38151.899
1962	.981	142658.512	.743	33188.425
1963	.988	148775.304	.722	34199.446
1964	.994	175526.157	.647	36282.844
1965	.985	185386.802	.728	40989.011
1966	.993	224599.194	.691	51729.378
1967	.988	239681.174	.633	45211.690

TABLE A.XII (CONTINUED)

	COTTON, FABR.		JUTE, FABR.	
1960	.675	108862.222	.623	20158.909
1961	.726	102243.802	.808	19818.069
1962	.770	89992.208	.788	24958.122
1963	.747	86950.469	.801	26590.512
1964	.748	100025.401	.923	21100.758
1965	.644	108959.627	1.055	20475.829
1966	.628	128609.873	1.150	21952.174
1967	.601	125420.965	1.036	23637.066

	WORSTEDS		PAPERBOARD	
1960	.949	22782.929	1.177	37818.182
1961	.983	24596.134	1.207	39753.107
1962	.969	27589.267	1.282	38562.402
1963	.949	24417.281	1.284	38326.324
1964	1.083	24117.267	1.283	42097.428
1965	1.128	23945.035	1.286	45360.031
1966	1.134	21708.113	1.318	47067.527
1967	1.160	22474.138	1.619	39862.878

	ROLLING MILL		TIN, BLOCKS	
1960	1.641	82119.439	.998	8274.549
1961	1.654	67659.613	1.149	7739.774
1962	1.741	64036.186	1.243	4991.150
1963	1.780	76803.933	1.269	9208.038
1964	1.787	119578.623	1.651	10640.824
1965	1.708	167900.468	1.979	10956.038
1966	1.683	123428.996	1.808	9338.496
1967	1.696	119508.255	1.662	9989.170

	GLASS		GASOLINE	
1960	1.480	13612.838	.986	15000.000
1961	1.527	14890.635	1.034	9925.532
1962	1.609	18550.031	.939	8495.208
1963	1.634	17892.289	1.184	8353.885
1964	1.711	20146.698	.687	13577.875
1965	1.696	20973.467	.762	12633.858
1966	1.676	21986.277	1.082	9973.198
1967	1.748	18418.764	1.136	15235.035

TABLE A.XII (CONTINUED)

	FERTILIZERS		CHEMICALS, IND.	
1960	1.019	14187.439	1.165	8707.296
1961	1.075	15381.395	1.198	9106.845
1962	1.169	13230.111	1.195	8478.661
1963	1.158	11575.130	1.192	9545.302
1964	1.175	13235.745	1.188	44500.000
1965	1.217	12749.384	1.180	51688.983
1966	1.219	13141.099	1.231	53635.256
1967	1.219	11347.006	1.252	58719.649

	RES. SECTION 4		FARM MACHINERY	
1960	1.340	716311.940	1.383	153472.885
1961	1.374	740469.432	1.476	144608.401
1962	1.422	786130.098	1.586	147754.098
1963	1.433	820221.912	1.625	184488.000
1964	1.480	859200.000	1.651	200191.399
1965	1.498	986184.913	1.680	210938.690
1966	1.474	1119694.030	1.728	239344.329
1967	1.472	1178651.495	1.785	234421.289

	MACHINERY		AUTOMOBILES	
1960	1.465	381155.631	1.340	434628.358
1961	1.535	360715.961	1.394	378868.723
1962	1.630	389156.442	1.467	425743.695
1963	1.647	418285.367	1.473	453925.322
1964	1.667	528133.773	1.479	552956.051
1965	1.686	603626.335	1.483	758449.764
1966	1.735	669207.493	1.481	1067288.994
1967	1.781	645581.134	1.498	1447505.340

	ELECTRIC		RES. SECTION 5	
1960	1.484	157024.259	1.375	829308.364
1961	1.522	161544.021	1.398	962888.412
1962	1.577	189440.076	1.424	954095.506
1963	1.567	179148.692	1.430	863167.832
1964	1.557	203793.192	1.443	939126.126
1965	1.549	238100.065	1.457	1105415.237
1966	1.568	300562.500	1.471	1262276.683
1967	1.615	338734.365	1.490	1521024.161

TABLE A.XII (CONTINUED)
3. SUBPERIOD 1968-1972

YEAR	PRICE	QUANTITY	PRICE	QUANTITY
	FRESH FRUITS		FRESH VEGETABLES	
1967	.902	143272.727	.917	83601.963
1968	1.000	141293.000	1.000	86590.000
1969	.922	161867.679	1.031	87922.405
1970	1.008	151630.952	.996	95935.743
1971	1.037	160121.504	1.181	85342.083
1972	1.139	158932.397	1.160	98662.931
	RAW SUGAR		COCOA	
1967	.992	47958.669	.863	11930.475
1968	1.000	46411.000	1.000	12156.000
1969	1.376	51080.669	1.252	9160.543
1970	1.665	51216.216	1.242	11602.254
1971	2.000	48505.000	.951	11760.252
1972	2.661	49051.484	.846	14355.792
	COFFEE		TEA	
1967	1.003	69464.606	1.091	21190.651
1968	1.000	72037.000	1.000	23124.000
1969	.992	70431.452	.989	21712.841
1970	1.256	64878.981	1.030	19574.757
1971	1.130	72998.230	1.021	22731.636
1972	1.194	68293.132	1.052	22865.970
	INDIAN CORN		MEAT	
1967	1.130	37300.000	1.028	48156.615
1968	1.000	40037.000	1.000	56591.000
1969	1.089	34355.372	.957	112452.456
1970	1.159	24746.333	1.002	103915.170
1971	1.186	11701.518	1.111	79422.142
1972	1.077	23256.267	1.131	124832.891
	LIVE ANIMALS		RES. SECTION 12	
1967	.951	23023.134	.957	431958.203
1968	1.000	15554.000	1.000	424394.000
1969	.992	18861.895	1.059	458860.246
1970	.985	30916.751	1.059	474564.684
1971	.979	40148.110	1.024	522171.875
1972	.948	47159.283	1.092	591401.099

TABLE A.XII (CONTINUED)

	SOYABEANS		HIDES	
1967	1.053	45643.875	1.099	6751.592
1968	1.000	31071.000	1.000	8549.000
1969	.972	42139.918	1.236	8358.414
1970	1.021	46000.979	1.082	7818.854
1971	1.123	41530.721	1.131	8063.660
1972	1.218	32108.374	1.986	7821.249

	COTTON, RAW		WOOL, RAW	
1967	.891	66636.364	1.189	9125.315
1968	1.000	49918.000	1.000	9837.000
1969	.911	51257.958	1.078	8355.288
1970	.846	44455.083	.980	6387.755
1971	.874	52542.334	.851	5075.206
1972	1.058	49482.987	1.094	5534.735

	WOOL, TOPS		IRON ORE	
1967	1.147	16529.207	1.127	42603.372
1968	1.000	17959.000	1.000	48661.000
1969	1.009	17128.840	1.070	44398.131
1970	.957	13964.472	1.169	46500.428
1971	.828	12873.188	1.133	44947.043
1972	.997	14117.352	1.061	50038.643

	BAUXITE + ALUMIN.		COPPER ORE	
1967	.958	77856.994	.895	30589.944
1968	1.000	83668.000	1.000	61345.000
1969	1.015	101420.690	1.036	9407.336
1970	1.010	98603.960	.903	9578.073
1971	1.009	95913.776	.793	23665.826
1972	.978	78285.276	.706	20104.816

	COAL, BITUM.		PETROLEUM	
1967	.958	145156.576	.995	357202.010
1968	1.000	154391.000	1.000	372586.000
1969	.997	108042.126	.971	405203.913
1970	1.218	118224.959	.952	436093.487
1971	1.268	113192.429	1.057	511933.775
1972	1.416	120533.898	1.154	589898.614

TABLE A.XII (CONTINUED)

	RUBBER		RES. SECTION 3	
1967	1.143	17026.247	.981	258600.408
1968	1.000	17043.000	1.000	271716.000
1969	1.410	18856.028	1.105	247267.873
1970	1.236	18891.586	1.118	280684.258
1971	.975	18938.462	1.009	332497.522
1972	.880	21771.591	1.082	368053.604

	COTTON, FABR.		JUTE, FABR.	
1967	.968	77869.835	1.096	22343.066
1968	1.000	56743.000	1.000	21346.000
1969	1.003	61859.422	1.133	22823.477
1970	.992	57442.540	1.154	20866.551
1971	.997	73266.800	1.218	17072.250
1972	1.076	97508.364	1.383	16181.490

	WORSTEDS		COATED FABRICS	
1967	1.066	24455.910	.994	26043.260
1968	1.000	25111.000	1.000	35123.000
1969	1.026	24858.674	.935	43534.759
1970	.976	22086.066	1.065	42461.033
1971	.906	15975.717	1.136	44065.141
1972	.922	18138.829	1.150	51373.913

	VENEERS		ROLLING MILL	
1967	.966	30652.174	1.113	182107.817
1968	1.000	33190.000	1.000	184309.000
1969	.967	50354.705	.997	277087.262
1970	.928	40600.216	1.102	206261.343
1971	.848	56323.113	1.125	249856.889
1972	.833	89993.998	1.183	257818.259

	TIN, BLOCKS		GASOLINE	
1967	1.054	15751.423	.963	17971.963
1968	1.000	14892.000	1.000	16767.000
1969	1.048	17123.092	1.093	23560.842
1970	1.157	17414.002	1.028	19535.992
1971	1.057	17384.106	1.000	18322.000
1972	1.071	20116.713	1.029	12594.752

TABLE A.XII (CONTINUED)

	HEAVY FUELS		CHEMICALS, IND.	
1967	1.021	62002.938	1.034	71099.613
1968	1.000	54539.000	1.000	78554.000
1969	.979	55990.807	.990	95366.667
1970	.979	58637.385	.980	96560.204
1971	1.354	50180.207	.955	107147.644
1972	1.354	44968.242	.929	130617.869

	CHEMICALS, INORG.		CHEMICALS, ORG.	
1967	1.013	63993.090	1.073	108110.904
1968	1.000	67710.000	1.000	129036.000
1969	.920	84490.217	.967	142742.503
1970	.947	148177.402	.952	140278.361
1971	.927	100310.680	.835	164523.353
1972	.943	101358.431	.840	199707.143

	RES. SECTION 4		FARM MACHINERY	
1967	.946	1664408.034	.965	433618.653
1968	1.000	1717266.000	1.000	353192.000
1969	1.008	2001567.460	1.037	338594.986
1970	1.026	1955623.782	1.069	287391.955
1971	1.028	2155260.700	1.098	350504.554
1972	1.046	2405214.149	1.138	431059.754

	DRILLING MACHINERY		AUTOMOBILES	
1967	.961	221206.035	.971	2233123.584
1968	1.000	231741.000	1.000	3000856.000
1969	1.027	293267.770	1.030	3465883.495
1970	1.042	257561.420	1.033	3147661.181
1971	1.046	280972.275	1.049	3918050.524
1972	1.046	354387.189	1.084	4551929.889

	ELECTRICAL		RES. SECTION 5	
1967	.986	554823.529	.975	3285668.718
1968	1.000	592100.000	1.000	3441665.000
1969	1.013	709233.959	1.030	3829335.922
1970	1.010	699683.168	1.059	3856386.213
1971	1.005	933017.910	1.077	3812202.414
1972	.997	1066104.313	1.089	4673321.396

TABLE A.XIII DISAGGREGATED VALUE AND PRICE SERIES,
EXPORTS 1948-1972
1. SUBPERIOD 1948-1960

YEAR	PRICE	QUANTITY	PRICE	QUANTITY
	WHEAT		BARLEY	
1948	1.000	243023.000	1.000	26947.000
1949	1.156	376434.256	1.028	24778.210
1950	1.117	291507.610	1.091	21486.709
1951	1.084	406866.236	.937	62776.948
1952	1.078	576337.662	.993	146710.977
1953	1.095	518636.530	.874	156440.503
1954	1.006	373100.398	.811	110188.656
1955	.994	340257.545	.839	91133.492
1956	.944	543518.008	.818	116108.802
1957	.916	415300.218	.769	87804.941
1958	.916	486984.716	.734	106427.793
1959	.939	470532.481	.741	89487.179
1960	.944	434801.907	.755	68133.775
	WHISKY		WHEAT FLOWER	
1948	1.000	26957.000	1.000	125151.000
1949	1.088	30057.904	.996	98085.341
1950	1.215	34306.173	.920	101998.913
1951	1.211	44623.452	.933	122030.011
1952	1.189	45629.941	.866	134012.702
1953	1.189	53058.032	.907	112635.061
1954	1.204	49132.890	.864	101885.417
1955	1.199	50760.634	.857	86863.477
1956	1.192	57600.671	.824	86831.311
1957	1.210	55366.942	.795	76949.686
1958	1.172	59962.457	.781	88857.875
1959	1.212	64572.607	.758	85624.011
1960	1.221	64881.245	.766	81251.958
	OATS		TOBACCO	
1948	1.000	22560.000	1.000	8099.000
1949	.921	20122.693	1.077	8000.929
1950	1.030	16088.350	.965	10934.715
1951	1.021	52790.402	1.101	14907.357
1952	.947	72059.134	1.130	19664.602
1953	.844	71567.536	1.081	14507.863
1954	.907	35796.031	1.110	16293.694
1955	1.037	11504.339	1.110	23916.216
1956	.983	9477.111	1.145	15126.638
1957	.839	26686.532	1.157	18932.584
1958	.862	15099.768	1.234	15036.467
1959	.911	8035.126	1.250	20112.000
1960	1.012	5717.391	1.367	18527.432

TABLE A.XIII (CONTINUED)

	BEEF+VEAL MEAT		CATTLE, SLAUGHTER	
1948	1.000	36594.000	1.000	47226.000
1949	1.027	29823.759	1.039	44413.859
1950	1.368	25013.889	1.226	50314.845
1951	1.832	27819.323	1.761	25164.111
1952	1.523	19910.046	1.429	1114.066
1953	1.219	7602.133	1.256	4074.045
1954	.819	5540.904	1.085	8493.088
1955	1.050	2591.429	1.112	3526.978
1956	.954	3819.706	.963	654.206
1957	.946	14118.393	.939	44385.517
1958	1.261	16007.137	1.109	75834.986
1959	1.357	6793.662	1.269	31839.243
1960	1.287	5487.179	1.150	23106.957

	CATTLE, DAIRY		MILK	
1948	1.000	26674.000	1.000	15190.000
1949	1.039	14728.585	.917	12223.555
1950	1.230	14178.862	.871	10529.277
1951	1.667	11248.350	.974	9252.567
1952	1.516	1771.768	.929	14248.654
1953	1.073	9300.093	.903	11763.012
1954	.973	7591.984	.966	7889.234
1955	.990	9561.616	.997	8069.208
1956	1.022	10624.266	1.000	8952.000
1957	1.075	8735.814	1.000	7571.000
1958	1.289	10139.643	1.037	10791.707
1959	1.494	7742.303	1.026	17236.842
1960	1.440	7913.889	1.029	16942.663

	EGGS		FISH 2	
1948	1.000	24318.000	1.000	84465.000
1949	1.040	14967.308	.925	100409.730
1950	.908	3959.251	1.009	110669.970
1951	1.040	3293.269	1.060	109996.226
1952	.870	6025.287	1.030	109343.689
1953	.982	3710.794	1.043	105710.451
1954	.914	3411.379	1.050	122670.476
1955	.886	1889.391	1.080	115006.481
1956	.936	1873.932	1.229	104848.657
1957	.699	4640.916	1.219	106050.861
1958	.727	7030.261	1.237	122132.579
1959	.571	8649.737	1.258	113645.469
1960	.673	4114.413	1.339	99732.636

TABLE A.XIII (CONTINUED)

	AGR.+ANIM. 12		CHEMICALS 12	
1948	1.000	239698.000	1.000	493.000
1949	1.006	149275.348	1.022	103.718
1950	1.015	147968.473	.983	190.234
1951	1.120	120833.036	1.137	1267.370
1952	1.082	120767.098	1.119	459.339
1953	1.021	160961.802	1.108	872.744
1954	.977	153577.277	1.088	8048.713
1955	.938	157886.994	1.101	12924.614
1956	.976	160351.434	1.119	9211.796
1957	1.026	124101.365	1.137	11008.795
1958	.992	143745.968	1.148	9016.551
1959	1.022	148090.998	1.167	10904.027
1960	1.018	150318.271	1.159	643.658

	MISCELLANEOUS 12		FISH 3	
1948	1.000	9.000	1.000	65.000
1949	1.037	4.822	.925	195.676
1950	1.120	18.750	1.009	536.174
1951	1.323	6.047	1.060	280.189
1952	1.297	+0.0	1.030	156.311
1953	1.236	+0.0	1.043	119.847
1954	1.235	+0.0	1.050	293.333
1955	1.252	.799	1.080	158.333
1956	1.266	6.319	1.229	191.212
1957	1.289	3.103	1.219	97.621
1958	1.288	2.329	1.237	56.589
1959	1.289	2.327	1.258	172.496
1960	1.339	2.987	1.339	192.681

	LEATHER 3		FURS	
1948	1.000	139.000	1.000	23262.000
1949	.941	108.395	.725	31080.000
1950	1.181	80.440	.917	25945.474
1951	1.438	113.352	1.084	26121.771
1952	1.138	164.323	.774	30370.801
1953	1.281	125.683	.741	28434.548
1954	1.209	72.787	.745	30868.456
1955	1.222	115.385	.871	32476.464
1956	1.284	152.648	.783	33068.966
1957	1.263	131.433	.725	35784.828
1958	1.322	44.629	.775	30092.903
1959	1.538	46.814	.811	29750.925
1960	1.331	45.079	.822	28176.399

TABLE A.XIII (CONTINUED)

	HIDES		PULPWOOD	
1948	1.000	8411.000	1.000	43573.000
1949	1.000	9303.000	1.031	30375.364
1950	1.152	6993.056	1.049	33143.947
1951	1.531	4874.592	1.222	55730.769
1952	.761	2549.277	1.325	48920.755
1953	.735	3809.524	1.310	35006.870
1954	.587	9056.218	1.260	36322.222
1955	.539	9406.308	1.265	38462.451
1956	.612	7341.503	1.204	41357.143
1957	.598	11015.050	1.267	38247.040
1958	.570	11601.754	1.266	27373.618
1959	.934	8972.163	1.218	24414.614
1960	.734	14476.839	1.224	25478.758

	IRON ORE		COPPER 3	
1948	1.000	5301.000	1.000	11020.000
1949	1.144	12340.035	1.002	15935.130
1950	1.212	10981.848	1.048	15090.649
1951	1.192	15600.671	1.301	11752.498
1952	1.156	19319.204	1.445	11047.059
1953	1.294	23835.394	1.428	22882.353
1954	1.283	30957.911	1.386	22163.059
1955	1.358	73500.736	1.709	23789.936
1956	1.442	100168.516	1.961	21663.947
1957	1.488	102339.382	1.341	22762.118
1958	1.473	73098.439	1.182	15165.821
1959	1.452	108687.328	1.391	14397.556
1960	1.567	99216.337	1.426	22171.108

	LEAD 3		ALUMINUM 3	
1948	1.000	1563.000	1.000	5142.000
1949	1.018	5068.762	1.044	1057.471
1950	.893	6566.629	1.054	1274.194
1951	1.146	6253.927	1.148	1087.108
1952	1.017	7926.254	1.251	521.183
1953	.713	20840.112	1.264	3011.076
1954	.709	20771.509	1.308	2973.242
1955	.761	19862.024	1.413	2945.506
1956	.858	15820.513	1.618	1600.124
1957	.713	14774.194	1.645	2035.258
1958	.535	20041.121	1.562	2104.994
1959	.527	19518.027	1.512	3227.513
1960	.533	18921.201	1.582	5719.975

TABLE A.XIII (CONTINUED)

	NICKEL 3		ZINC 3	
1948	1.000	29341.000	1.000	5651.000
1949	1.297	32728.604	1.036	12757.722
1950	1.545	30893.851	1.141	15878.177
1951	1.860	32843.548	1.556	18152.314
1952	1.902	37492.114	1.532	22828.982
1953	2.000	35821.000	.912	25524.123
1954	2.047	36309.233	.801	23975.031
1955	2.205	36463.946	.926	25323.974
1956	2.248	39085.409	1.067	25302.718
1957	2.482	40448.832	.916	23406.114
1958	2.467	38019.457	.746	29432.976
1959	2.368	39539.274	.806	26743.176
1960	2.298	47301.567	.911	18858.397

	SILVER 3		PLATINUM	
1948	1.000	2434.000	1.000	16832.000
1949	1.000	3005.000	1.045	17268.900
1950	1.074	2554.004	.919	23084.875
1951	1.222	1685.761	1.098	27649.362
1952	1.117	2533.572	1.021	29997.062
1953	1.117	4129.812	1.038	25327.553
1954	1.109	6276.826	.971	28465.499
1955	1.157	4198.790	.936	28114.316
1956	1.183	4962.806	1.183	30140.321
1957	1.187	4164.280	1.037	26828.351
1958	1.174	3640.545	.782	19217.391
1959	1.217	5102.712	.771	16282.750
1960	1.222	6755.319	.910	17697.802

	ASBESTOS		COAL	
1948	1.000	41399.000	1.000	11556.000
1949	1.160	31839.655	1.042	3420.345
1950	1.257	49922.037	1.037	3083.896
1951	1.429	56216.235	1.075	3252.093
1952	1.543	56066.105	1.248	2567.308
1953	1.566	53622.605	1.289	1551.590
1954	1.542	53544.747	1.288	1332.298
1955	1.545	61361.812	1.283	3796.571
1956	1.636	61060.513	1.268	3714.511
1957	1.658	64570.567	1.321	2542.014
1958	1.704	53254.108	1.332	2183.183
1959	1.713	64466.433	1.370	2614.599
1960	1.706	70406.213	1.377	4930.283

TABLE A.XIII (CONTINUED)

	AGR.+ANIM. 3		TEXTILES 3	
1948	1.000	61444.000	1.000	5915.000
1949	1.006	59167.992	1.034	5589.942
1950	1.015	38813.793	1.128	6394.504
1951	1.120	35411.607	1.398	5645.923
1952	1.082	35010.166	1.200	4577.500
1953	1.021	35814.887	1.141	5077.125
1954	.977	43506.653	1.086	5193.370
1955	.938	66505.330	1.064	6552.632
1956	.976	82461.066	1.087	6238.270
1957	1.026	107637.427	1.124	7105.872
1958	.992	96210.685	1.080	4595.370
1959	1.022	87068.493	1.078	5577.922
1960	1.018	94990.177	1.105	4677.828

	WOOD 3		IRON 3	
1948	1.000	22786.000	1.000	187.000
1949	.981	19399.592	1.096	920.620
1950	1.059	15050.992	1.114	1825.853
1951	1.229	17529.699	1.249	1293.835
1952	1.236	27430.421	1.336	3133.982
1953	1.197	17298.246	1.378	11521.771
1954	1.172	15327.645	1.335	11886.142
1955	1.194	16820.771	1.368	15304.094
1956	1.228	16678.339	1.455	20912.027
1957	1.232	17315.747	1.535	18644.951
1958	1.223	14183.974	1.568	7904.337
1959	1.228	15208.469	1.612	7928.660
1960	1.214	16259.473	1.608	8504.353

	NON-FERROUS 3		NON-METALLIC 3	
1948	1.000	9662.000	1.000	8312.000
1949	.892	6902.466	1.124	6542.705
1950	1.175	5297.021	1.206	6741.294
1951	1.348	4316.024	1.317	8249.051
1952	1.393	9705.671	1.432	10006.285
1953	1.364	15462.610	1.494	13473.226
1954	1.362	13997.063	1.502	13932.756
1955	1.475	35334.237	1.499	38260.841
1956	1.605	48353.894	1.561	83011.531
1957	1.541	99513.952	1.594	110172.522
1958	1.494	192726.238	1.653	68726.558
1959	1.527	211666.012	1.651	77243.489
1960	1.688	162848.341	1.653	92943.739

TABLE A.XIII (CONTINUED)

	MISCELLANEOUS 3		FISH 4	
1948	1.000	351.000	1.000	498.000
1949	1.037	315.333	.925	744.865
1950	1.120	392.857	1.009	506.442
1951	1.323	541.194	1.060	538.679
1952	1.297	431.766	1.030	524.272
1953	1.236	478.155	1.043	721.956
1954	1.235	396.761	1.050	740.952
1955	1.252	658.147	1.080	842.593
1956	1.266	706.161	1.229	678.600
1957	1.289	659.426	1.219	770.304
1958	1.288	767.857	1.237	1007.276
1959	1.289	843.289	1.258	821.145
1960	1.339	143.391	1.339	622.853

	LEATHER 4		NEWSPRINT	
1948	1.000	9102.000	1.000	383123.000
1949	.941	4905.420	1.041	416793.468
1950	1.181	5029.636	1.111	437215.122
1951	1.438	4764.951	1.185	452634.599
1952	1.138	3750.439	1.253	472298.484
1953	1.281	5175.644	1.300	476179.231
1954	1.209	5738.627	1.300	488976.923
1955	1.222	6412.439	1.305	510250.575
1956	1.284	6769.470	1.341	528251.305
1957	1.263	7603.325	1.368	523019.006
1958	1.322	7863.843	1.370	503802.190
1959	1.538	7104.681	1.379	523764.322
1960	1.331	6665.665	1.381	548826.937

	WOOD PULP		PLANKS	
1948	1.000	211564.000	1.000	196023.000
1949	.911	187349.067	.936	171388.889
1950	.930	224253.763	1.036	280740.347
1951	1.356	269272.124	1.166	267751.286
1952	1.245	234428.112	1.136	260518.486
1953	1.039	239340.712	1.077	261934.076
1954	1.007	269531.281	1.038	312836.224
1955	1.016	292622.047	1.074	358764.432
1956	1.045	291422.010	1.067	305946.579
1957	1.049	278747.378	1.004	280558.765
1958	1.056	270311.553	.973	300116.136
1959	1.054	295306.452	.995	324493.467
1960	1.016	320001.969	.974	355544.148

TABLE A.XIII (CONTINUED)

	SHINGLES		PLYWOOD	
1948	1.000	22155.000	1.000	11928.000
1949	.819	20263.736	.936	5306.624
1950	1.170	27459.829	1.105	6200.905
1951	1.115	24443.946	1.254	8213.716
1952	.995	19945.729	1.254	8236.045
1953	1.062	19557.439	1.228	6529.316
1954	1.104	21779.891	1.105	9486.878
1955	1.225	23541.224	1.167	13944.302
1956	1.300	18670.769	1.096	12471.715
1957	1.170	16368.376	.956	12345.188
1958	1.131	17297.082	.930	10416.129
1959	1.253	16823.623	.958	15122.129
1960	1.131	18235.190	.844	18563.981

	PIG IRON		COPPER 4	
1948	1.000	29.000	1.000	64187.000
1949	.987	555.218	1.002	67950.100
1950	.973	8589.928	1.048	64099.237
1951	1.246	9874.799	1.301	51038.432
1952	1.155	16595.671	1.445	58714.879
1953	1.114	15245.961	1.428	59295.518
1954	1.120	8948.214	1.386	69708.514
1955	1.181	11238.781	1.709	72128.145
1956	1.241	11375.504	1.961	77370.219
1957	1.297	25503.470	1.341	87042.506
1958	1.340	13626.866	1.182	99064.298
1959	1.248	20209.135	1.391	99784.328
1960	1.216	19555.921	1.426	126098.177

	LEAD 4		ALUMINUM 4	
1948	1.000	32759.000	1.000	87596.000
1949	1.018	36075.639	1.044	86137.931
1950	.893	36104.143	1.054	96644.213
1951	1.146	33266.143	1.148	104185.540
1952	1.017	40919.371	1.251	123463.629
1953	.713	32224.404	1.264	134155.854
1954	.709	36393.512	1.308	136470.183
1955	.761	29011.827	1.413	146361.642
1956	.858	25002.331	1.618	143521.632
1957	.713	26454.418	1.645	137409.119
1958	.535	28742.056	1.562	140303.457
1959	.527	28810.247	1.512	149341.270
1960	.533	29939.962	1.582	163783.186

TABLE A.XIII (CONTINUED)

	NICKEL 4		ZINC 4	
1948	1.000	44461.000	1.000	36686.000
1949	1.297	38453.354	1.036	41006.757
1950	1.545	37261.489	1.141	35577.564
1951	1.860	40645.699	1.556	35619.537
1952	1.902	41888.538	1.532	40019.582
1953	2.000	45450.500	.912	37601.974
1954	2.047	52676.600	.801	48923.845
1955	2.205	61118.367	.926	50871.490
1956	2.248	60073.399	1.067	44060.918
1957	2.482	59572.925	.916	47468.341
1958	2.467	48149.980	.746	44809.651
1959	2.368	56261.402	.806	41851.117
1960	2.298	62031.767	.911	50883.644

	SILVER 4		ABRASIVES	
1948	1.000	4026.000	1.000	13381.000
1949	1.000	4568.000	1.084	10577.491
1950	1.074	6218.808	1.179	12525.021
1951	1.222	11800.327	1.182	18085.448
1952	1.117	11296.329	1.245	14217.671
1953	1.117	10950.761	1.455	19914.777
1954	1.109	10813.345	1.559	17461.193
1955	1.157	12519.447	1.539	17506.173
1956	1.183	10837.701	1.578	17990.494
1957	1.187	9849.200	1.641	20664.839
1958	1.174	12163.543	1.766	12863.533
1959	1.217	11101.890	1.691	16402.720
1960	1.222	9259.411	1.723	18419.037

	FERTILIZERS		AGR.+ANIM. 4	
1948	1.000	36374.000	1.000	20351.000
1949	1.081	36433.858	1.006	18724.652
1950	1.112	34958.633	1.015	10379.310
1951	1.203	29704.073	1.120	13514.286
1952	1.281	33015.613	1.082	10082.255
1953	1.246	34215.891	1.021	10257.591
1954	1.223	34621.423	.977	9423.746
1955	1.204	46757.475	.938	15229.211
1956	1.163	42313.844	.976	19140.369
1957	1.128	43402.482	1.026	17385.965
1958	1.141	40732.691	.992	14575.605
1959	1.125	43370.667	1.022	16666.341
1960	1.146	45678.883	1.018	15054.028

TABLE A.XIII (CONTINUED)

	TEXTILES 4		WOOD 4	
1948	1.000	22585.000	1.000	53442.000
1949	1.034	14340.426	.981	33586.137
1950	1.128	15340.426	1.059	31237.016
1951	1.398	16792.561	1.229	40559.805
1952	1.200	15260.833	1.236	41330.906
1953	1.141	12918.493	1.197	37559.733
1954	1.086	11009.208	1.172	36840.444
1955	1.064	11195.489	1.194	44530.988
1956	1.087	10526.219	1.228	48881.922
1957	1.124	13887.011	1.232	47622.565
1958	1.080	11793.519	1.223	48026.165
1959	1.078	14222.635	1.228	55775.244
1960	1.105	25919.457	1.214	55470.346

	IRON 4		NON-FERROUS 4	
1948	1.000	61654.000	1.000	26040.000
1949	1.096	47822.080	.892	18628.924
1950	1.114	43585.278	1.175	17466.383
1951	1.249	47820.657	1.348	22216.617
1952	1.336	50848.054	1.393	42380.474
1953	1.378	40616.110	1.364	22393.695
1954	1.335	14198.502	1.362	20937.592
1955	1.368	47445.175	1.475	24147.797
1956	1.455	44381.443	1.605	27257.944
1957	1.535	51579.805	1.541	24689.163
1958	1.568	36500.638	1.494	16280.455
1959	1.612	60403.226	1.527	18455.141
1960	1.608	81036.070	1.688	19881.517

	NON-METALLIC 4		CHEMICALS 4	
1948	1.000	19390.000	1.000	38848.000
1949	1.124	12058.719	1.022	26381.605
1950	1.206	11645.108	.983	58104.781
1951	1.317	10923.311	1.137	78043.975
1952	1.432	14694.134	1.119	68558.534
1953	1.494	7854.083	1.108	79914.260
1954	1.502	8366.178	1.088	96284.007
1955	1.499	14376.251	1.101	98643.052
1956	1.561	18401.666	1.119	105646.113
1957	1.594	22927.227	1.137	111637.643
1958	1.653	11862.674	1.148	113691.638
1959	1.651	14392.489	1.167	114111.397
1960	1.653	15788.264	1.159	154019.845

TABLE A.XIII (CONTINUED)

	MISCELLANEOUS 4		FARM MACHINERY	
1948	1.000	4376.000	1.000	73760.000
1949	1.037	4671.167	1.110	83357.658
1950	1.120	5448.214	1.158	75829.879
1951	1.323	6000.000	1.312	81126.524
1952	1.297	7074.788	1.368	77052.632
1953	1.236	6751.618	1.381	53813.179
1954	1.235	6009.717	1.387	55350.397
1955	1.252	8479.233	1.394	54526.542
1956	1.266	12002.370	1.468	45964.578
1957	1.289	14869.666	1.569	44407.903
1958	1.288	9767.081	1.659	58827.004
1959	1.289	10826.222	1.743	65803.213
1960	1.339	11595.220	1.767	48345.218

	MACHINERY		AUTOMOBILES	
1948	1.000	40539.000	1.000	55086.000
1949	1.069	29784.846	1.178	32943.973
1950	1.136	22573.944	1.168	34441.781
1951	1.208	33336.921	1.246	63504.013
1952	1.144	41414.336	1.256	88387.739
1953	1.161	33262.705	1.265	59539.921
1954	1.183	32267.117	1.258	21544.515
1955	1.230	29096.748	1.273	31247.447
1956	1.317	35785.877	1.360	31241.176
1957	1.368	41796.053	1.444	27753.463
1958	1.418	33061.354	1.523	23636.244
1959	1.428	33895.658	1.549	22790.833
1960	1.465	45784.300	1.565	33133.546

	AGR.+ANIM. 5		TEXTILES 5	
1948	1.000	28449.000	1.000	17054.000
1949	1.006	15472.167	1.034	4457.447
1950	1.015	13933.005	1.128	4482.270
1951	1.120	24391.071	1.398	3926.323
1952	1.082	16566.543	1.200	3242.500
1953	1.021	9704.212	1.141	3330.412
1954	.977	12319.345	1.086	3105.893
1955	.938	10976.546	1.064	3695.489
1956	.976	9840.164	1.087	3997.240
1957	1.026	9505.848	1.124	3173.488
1958	.992	8724.798	1.080	2740.741
1959	1.022	11948.141	1.078	3387.755
1960	1.018	9157.171	1.105	4895.023

TABLE A.XIII (CONTINUED)

	WOOD 5		IRON 5	
1948	1.000	9080.000	1.000	44909.000
1949	.981	5588.175	1.096	56206.204
1950	1.059	4748.820	1.114	22594.255
1951	1.229	6772.172	1.249	19391.513
1952	1.236	5826.861	1.336	22098.802
1953	1.197	4405.180	1.378	36656.749
1954	1.172	4357.509	1.335	55492.135
1955	1.194	4528.476	1.368	35290.205
1956	1.228	5577.362	1.455	33122.337
1957	1.232	5788.961	1.535	38274.919
1958	1.223	5175.797	1.568	35968.750
1959	1.228	5777.687	1.612	44514.268
1960	1.214	6597.199	1.608	48282.338

	NON-FERROUS 5		NON-METALLIC 5	
1948	1.000	18548.000	1.000	877.000
1949	.892	14822.870	1.124	745.552
1950	1.175	9842.553	1.206	633.499
1951	1.348	14148.368	1.317	814.730
1952	1.393	25303.661	1.432	480.447
1953	1.364	28397.361	1.494	388.889
1954	1.362	17651.248	1.502	383.489
1955	1.475	14722.034	1.499	453.636
1956	1.605	14209.969	1.561	512.492
1957	1.541	17316.677	1.594	501.255
1958	1.494	17565.596	1.653	464.005
1959	1.527	22259.987	1.651	723.198
1960	1.688	29303.318	1.653	724.138

	CHEMICALS 5		MISCELLANEOUS 5	
1948	1.000	4125.000	1.000	107826.000
1949	1.022	4153.620	1.037	82468.660
1950	.983	4422.177	1.120	25064.286
1951	1.137	5082.674	1.323	12587.302
1952	1.119	4504.915	1.297	44181.187
1953	1.108	5180.505	1.236	65558.252
1954	1.088	4997.243	1.235	40391.093
1955	1.101	3973.660	1.252	22862.620
1956	1.119	4572.833	1.266	43848.341
1957	1.137	6065.084	1.289	59020.171
1958	1.148	8454.704	1.288	111445.652
1959	1.167	6035.990	1.289	42860.357
1960	1.159	5249.353	1.339	34989.544

TABLE A.XIII (CONTINUED)
2. SUBPERIOD 1960-1968

YEAR	PRICE	QUANTITY	PRICE	QUANTITY
	WHEAT		BARLEY	
1960	.944	434801.907	.755	68133.775
1961	1.011	655975.272	.727	67353.508
1962	1.134	530439.153	.979	30568.948
1963	1.117	704390.331	.867	28286.044
1964	1.145	893900.437	.853	60086.753
1965	1.073	783014.911	.916	47684.498
1966	1.106	959014.467	.958	46927.975
1967	1.184	626586.149	.930	78074.194
	WHISKY		WHEAT FLOWER	
1960	1.221	64881.245	.766	81251.958
1961	1.214	66224.876	.787	77606.099
1962	1.250	67908.000	.854	66795.082
1963	1.215	74176.955	.874	71643.021
1964	1.200	85683.333	.870	115235.632
1965	1.174	99644.804	.948	69941.983
1966	1.204	105903.654	.944	87750.000
1967	1.171	120848.847	.957	63386.625
	OATS		TOBACCO	
1960	1.012	5717.391	1.367	18716.167
1961	1.062	2592.279	1.417	19777.699
1962	.935	7484.492	1.433	24551.291
1963	.924	24165.584	1.557	18973.025
1964	.921	13849.077	1.550	24751.613
1965	.978	19107.362	1.667	21213.557
1966	.982	13610.998	1.920	20834.896
1967	.917	7284.624	2.187	22805.213
	BEEF		MILK	
1960	1.287	5487.179	1.029	16942.663
1961	1.166	8734.134	1.006	16109.344
1962	1.360	6032.353	1.054	12061.670
1963	1.415	5318.728	1.006	13583.499
1964	1.291	9418.280	1.000	33942.000
1965	1.255	23458.964	1.097	21139.471
1966	1.494	17637.216	1.146	12663.176
1967	1.633	8799.755	1.069	18442.470

TABLE A.XIII (CONTINUED)

EGGS

1960	.673	4114.413
1961	.731	2768.810
1962	.743	452.221
1963	.770	496.104
1964	.735	808.163
1965	1.033	137.464
1966	1.045	127.273
1967	.941	44.633

FISH

1960	1.339	96638.536
1961	1.379	98267.585
1962	1.439	101715.080
1963	1.460	109473.973
1964	1.582	117813.527
1965	1.736	113265.553
1966	1.779	113799.325
1967	1.845	117203.794

CHEESE

1960	1.135	5721.586
1961	1.135	5589.427
1962	1.074	8278.399
1963	1.151	7855.778
1964	1.192	9364.094
1965	1.209	9657.568
1966	1.300	10902.308
1967	1.314	8528.919

LIVE ANIMALS

1960	1.251	32804.157
1961	1.175	56937.021
1962	1.306	52108.729
1963	1.280	32789.844
1964	1.281	26943.013
1965	1.155	68513.420
1966	1.314	59362.253
1967	1.473	28725.730

RES. SECTION 12

1960	1.034	144194.391
1961	1.068	134013.109
1962	1.027	175335.930
1963	1.023	208671.554
1964	1.020	228120.588
1965	1.035	239176.812
1966	1.091	239538.038
1967	1.042	256720.729

FURS

1960	.822	28176.399
1961	.663	36122.172
1962	.699	36546.495
1963	.786	41165.394
1964	.763	39748.362
1965	.736	41175.272
1966	.845	38563.314
1967	.647	46669.243

HIDES

1960	.734	14476.839
1961	.777	13637.066
1962	.828	11099.034
1963	.630	12625.397
1964	.601	15898.502
1965	.684	22302.632
1966	.955	28698.429
1967	.718	26479.109

PULPWOOD

1960	1.224	25478.758
1961	1.215	27827.984
1962	1.182	30230.118
1963	1.182	30444.162
1964	1.128	32645.390
1965	1.197	34101.086
1966	1.184	34606.419
1967	1.231	31128.351

TABLE A.XIII (CONTINUED)

	IRON ORE		PLATINUM	
1960	1.567	99216.337	.910	17658.242
1961	1.656	86090.580	.962	27363.825
1962	1.700	129718.824	1.016	23724.409
1963	1.869	144970.037	.999	23264.264
1964	1.852	192228.402	1.089	19733.701
1965	1.854	194616.505	1.172	26085.324
1966	1.952	189041.496	1.232	22560.065
1967	1.985	192978.841	1.338	23193.572

	ASBESTOS		COAL	
1960	1.738	69109.896	1.377	4930.283
1961	1.747	75180.882	1.417	6027.523
1962	1.753	77374.786	1.608	5342.040
1963	1.728	80698.495	1.745	5682.521
1964	1.705	91323.167	1.792	6732.701
1965	1.751	90609.366	1.787	7153.330
1966	1.779	102576.728	1.691	8027.794
1967	1.826	94412.377	1.598	9706.508

	RES. SECTION 3		LEATHER	
1960	1.637	458811.851	1.373	6476.329
1961	1.666	491184.874	1.373	7981.792
1962	1.751	515290.120	1.351	8350.111
1963	1.771	511633.540	1.242	7623.188
1964	1.804	551092.018	1.225	7903.673
1965	1.863	598223.833	.796	10982.412
1966	1.943	645288.729	.846	11698.582
1967	2.000	709384.000	.771	12019.455

	NEWSPRINT		WOOD PULP	
1960	1.381	548826.937	1.016	320001.969
1961	1.375	553682.182	.978	354459.100
1962	1.381	545300.507	.978	378222.904
1963	1.381	550318.610	.958	423060.543
1964	1.381	604377.987	.983	468824.008
1965	1.366	636592.972	.999	493994.995
1966	1.397	693073.729	.982	529600.815
1967	1.445	661080.277	.987	550590.679

TABLE A.XIII (CONTINUED)

	LUMBER		SHINGLES	
1960	.974	355544.148	1.131	18235.190
1961	.929	381987.083	1.063	19233.302
1962	.926	428452.484	1.131	20903.625
1963	.945	478819.048	1.244	24370.579
1964	.964	495172.199	1.316	24275.076
1965	.982	498914.460	1.256	23200.637
1966	1.023	467305.963	1.236	21286.408
1967	1.040	489822.115	1.239	21292.978

	PLYWOOD		PIG IRON	
1960	.844	18563.981	1.216	19555.921
1961	.813	19725.707	1.222	23787.234
1962	.792	29416.667	1.277	19552.858
1963	.899	31632.925	1.271	19135.327
1964	.781	48463.508	1.232	23856.331
1965	.792	47361.111	1.209	24385.443
1966	.771	53849.546	1.314	20590.563
1967	.729	65183.813	1.243	20419.952

	ROLLING MILL		COPPER	
1960	1.640	40875.000	1.426	126098.177
1961	1.640	29050.610	1.400	123874.286
1962	1.636	35603.912	1.500	102792.000
1963	1.629	45529.159	1.458	105821.674
1964	1.629	52950.890	1.528	113829.188
1965	1.686	55921.708	1.709	103056.758
1966	1.702	55881.904	2.318	96664.366
1967	1.683	64490.196	2.297	132079.234

	ALUMINUM		NICKEL	
1960	1.582	164558.786	2.298	62031.767
1961	1.638	147634.310	2.484	77152.576
1962	1.663	171108.839	2.715	70554.696
1963	1.660	182367.470	2.485	70570.624
1964	1.756	181057.517	2.401	82109.538
1965	1.750	206265.714	2.386	87118.189
1966	1.744	213460.436	2.472	85935.680
1967	1.783	223729.669	2.731	83960.820

TABLE A.XIII (CONTINUED)

	ZINC		ABRASIVES	
1960	.911	50883.644	1.723	18821.242
1961	.813	51706.027	1.836	16015.251
1962	.781	52209.987	1.780	16905.056
1963	.824	50564.320	1.720	16061.628
1964	1.025	60220.488	1.766	16865.232
1965	1.062	66839.925	1.805	18972.853
1966	1.031	64805.044	1.800	21646.111
1967	.949	75348.788	1.825	18914.521

	FERTILIZERS		ELECTRICITY	
1960	1.146	45678.883	1.173	13236.147
1961	1.145	46531.004	1.353	11673.319
1962	1.163	51466.036	1.640	10065.854
1963	1.148	64876.307	1.640	9730.488
1964	1.164	73973.368	1.713	10509.632
1965	1.199	93212.677	1.713	9043.783
1966	1.237	112783.347	1.713	9450.088
1967	1.263	122424.386	1.727	9430.805

	RES. SECTION 4		FARM MACHINERY	
1960	1.079	401476.367	1.767	50705.150
1961	1.056	419454.545	1.826	46849.398
1962	1.060	441934.906	1.877	48736.281
1963	1.110	477754.955	1.918	59730.970
1964	1.149	565616.188	1.959	71808.065
1965	1.190	587523.529	1.996	81127.756
1966	1.196	648474.916	2.056	88763.132
1967	1.187	670296.546	2.118	91736.544

	MACHINERY		AUTOMOBILES	
1960	1.465	37004.096	1.565	43087.540
1961	1.536	42508.464	1.607	28943.995
1962	1.631	52126.303	1.685	33873.591
1963	1.647	65019.429	1.663	52702.946
1964	1.667	81361.728	1.669	106282.804
1965	1.686	95177.936	1.643	216661.595
1966	1.735	120845.533	1.664	597112.981
1967	1.781	136753.509	1.622	1072232.429

TABLE A.XIII (CONTINUED)

	CONS. GOODS		RUBBER	
1960	1.222	5574.468	1.802	3249.723
1961	1.227	7094.540	1.631	3151.441
1962	1.234	10669.368	1.566	4872.286
1963	1.248	16892.628	1.660	6653.012
1964	1.262	22726.624	1.709	4834.406
1965	1.277	25252.937	1.823	4097.641
1966	1.311	37577.422	1.791	5405.918
1967	1.368	39742.690	2.049	7917.521

	RES. SECTION 5	
1960	1.618	115760.816
1961	1.667	176600.480
1962	1.675	239041.194
1963	1.681	260390.244
1964	1.695	364823.009
1965	1.720	338401.744
1966	1.743	387044.177
1967	1.768	491134.050

TABLE A.XIII (CONTINUED)
3. SUBPERIOD 1968-1972

YEAR	PRICE	QUANTITY	PRICE	QUANTITY
	WHEAT		BARLEY	
1967	1.050	706550.476	1.047	69349.570
1968	1.000	684469.000	1.000	40043.000
1969	.955	494978.010	.795	38272.956
1970	.866	793801.386	.769	173573.472
1971	.878	948930.524	.830	235256.627
1972	.899	1031266.963	.830	261392.771
	WHISKY		WHEAT FLOWER	
1967	1.002	141231.537	.959	63254.432
1968	1.000	158253.000	1.000	57940.000
1969	.980	192932.653	1.002	51992.016
1970	.916	199934.498	.975	59164.103
1971	.893	207123.180	.883	58028.313
1972	.867	241738.178	.850	51381.176
	TOBACCO		BEEF	
1967	.966	51630.435	1.009	14248.761
1968	1.000	57467.000	1.000	23735.000
1969	.983	63942.014	1.128	23378.546
1970	.957	58981.191	1.182	41002.538
1971	.940	61148.936	1.190	39506.723
1972	.887	66710.259	1.322	29881.241
	FISH		CHEESE	
1967	.950	227622.105	1.090	10281.651
1968	1.000	234533.000	1.000	16236.000
1969	1.079	237417.053	.991	14292.634
1970	1.187	207313.395	1.069	15142.189
1971	1.271	209397.325	1.524	12408.136
1972	1.501	207584.277	1.910	7810.995
	LIVE ANIMALS		RES. SECTION 12	
1967	.925	45743.784	1.071	274447.246
1968	1.000	59365.000	1.000	281081.000
1969	1.164	46738.832	.982	311550.916
1970	1.195	57044.351	.949	391329.821
1971	1.196	56305.184	.971	402512.873
1972	1.427	60337.071	1.168	382258.562

TABLE A.XIII (CONTINUED)

	FURS		HIDES	
1967	.946	31918.605	1.193	15936.295
1968	1.000	33223.000	1.000	16133.000
1969	1.075	30576.744	1.313	13912.414
1970	.853	32375.147	1.227	13132.029
1971	.827	27465.538	1.096	12876.825
1972	1.079	28104.727	2.185	16378.947

	PULPWOOD		IRON ORE	
1967	.978	39180.982	1.007	380400.199
1968	1.000	36595.000	1.000	443202.000
1969	.990	32797.980	.960	336770.833
1970	1.039	36142.445	.992	479579.637
1971	1.070	33605.607	.986	419200.811
1972	1.096	24230.839	.962	366611.227

	NICKEL		PLATINUM	
1967	.924	220758.658	.959	32359.750
1968	1.000	261030.000	1.000	40131.000
1969	1.066	211361.163	1.073	28773.532
1970	1.366	272029.283	1.128	40565.603
1971	1.368	297788.743	1.024	38078.125
1972	1.359	282423.841	1.004	35912.351

	ASBESTOS		PETROLEUM	
1967	.976	176636.270	.993	400679.758
1968	1.000	192896.000	1.000	446413.000
1969	1.037	208558.341	.996	527891.566
1970	1.081	210220.167	1.007	644563.059
1971	1.092	207682.234	1.090	722382.569
1972	1.110	211854.955	1.105	911769.231

	NATURAL GAS		RES. SECTION 3	
1967	.953	129762.854	.969	731433.437
1968	1.000	153752.000	1.000	844203.000
1969	1.023	172226.784	1.037	850518.804
1970	1.043	197495.686	1.055	973770.616
1971	1.082	231718.115	.935	1140450.267
1972	1.187	258502.949	.935	1224448.128

TABLE A.XIII (CONTINUED)

	NEWSPRINT		WOOD PULP	
1967	.967	987860.393	1.016	534875.000
1968	1.000	989831.000	1.000	627874.000
1969	1.033	1089835.431	1.035	728007.729
1970	1.036	1071807.915	1.126	697359.680
1971	1.050	1032836.190	1.115	715822.422
1972	1.079	1073169.601	1.068	767909.176

	LUMBER		PIG IRON	
1967	.853	597203.986	1.005	25255.721
1968	1.000	656301.000	1.000	26967.000
1969	1.124	623310.498	.976	36695.697
1970	1.000	663775.000	1.031	34258.002
1971	1.091	760298.808	1.123	29178.094
1972	1.326	885552.036	1.103	34740.707

	ROLLING MILL		COPPER	
1967	.982	110526.477	.955	317681.675
1968	1.000	137410.000	1.000	335675.000
1969	1.087	98168.353	1.045	243683.254
1970	1.054	188703.036	1.271	332437.451
1971	1.145	152691.703	.967	361348.501
1972	1.096	166109.489	.942	389226.115

	ALUMINUM		NICKEL	
1967	1.009	395351.833	.922	248695.228
1968	1.000	445128.000	1.000	245434.000
1969	1.054	450427.894	1.117	202443.151
1970	1.083	423487.535	1.477	293983.751
1971	.991	453590.313	1.339	238613.891
1972	.948	404832.278	1.342	232228.763

	ZINC		ABRASIVES	
1967	1.015	70449.261	.940	36722.340
1968	1.000	75411.000	1.000	38465.000
1969	1.025	72746.341	1.054	43278.937
1970	1.060	82906.604	1.099	41653.321
1971	1.056	73997.159	1.096	34893.248
1972	1.292	97070.433	1.094	41335.466

TABLE A.XIII (CONTINUED)

	CHEMICALS		ELECTRICITY	
1967	1.069	112638.915	1.014	16062.130
1968	1.000	132764.000	1.000	14321.000
1969	.988	154488.866	1.127	16412.600
1970	.968	191172.521	1.716	20043.124
1971	1.032	174042.636	2.014	23976.167
1972	1.011	189661.721	1.762	38562.997

	RES. SECTION 4		FARM MACHINERY	
1967	.882	1035171.202	.970	200307.216
1968	1.000	1129517.000	1.000	168549.000
1969	.983	1214079.349	1.034	174564.797
1970	.955	1470531.937	1.064	154498.120
1971	.958	1476399.791	1.103	158615.594
1972	1.028	1656538.911	1.148	189059.233

	MACHINERY		AUTOMOBILES	
1967	.973	250316.547	.979	1776466.803
1968	1.000	295347.000	1.000	2690832.000
1969	1.029	358531.584	1.012	3519307.312
1970	1.068	386232.210	1.033	3387039.690
1971	1.097	389439.380	1.052	3964847.909
1972	1.115	405018.834	1.071	4405584.500

	CONS. GOODS		RUBBER	
1967	.972	55934.156	.993	16347.432
1968	1.000	73557.000	1.000	11800.000
1969	1.030	96584.466	1.041	9787.704
1970	1.058	101853.497	1.045	19033.493
1971	1.079	106757.183	1.019	17377.821
1972	1.107	110512.195	1.012	23922.925

	RES. SECTION 5	
1967	.993	874436.052
1968	1.000	1056379.000
1969	1.025	1129329.756
1970	1.056	1276141.098
1971	1.079	1192852.641
1972	1.098	1459565.574

TABLE A.XIV IMPORT DUTIES, DISAGGREGATED SERIES, 1948-1972
1. SUBPERIOD 1948-1960

	BANANAS	CITRUS	D FRUITS	NUTS
1948	2277000	94000	1011000	371000
1949	2079000	126000	956000	539000
1950	1831000	152000	675000	556000
1951	1612000	165000	959000	387000
1952	1733000	216000	882000	386000
1953	1794000	217000	854000	388000
1954	1650000	18000	774000	349000
1955	1574000	30000	776000	321000
1956	1728000	9000	739000	366000
1957	1590000	7000	822000	387000
1958	1617000	9000	594000	384000
1959	1694000	10000	491000	373000
1960	1893000	7000	675000	409000

	VEGETABLES	SUGAR	COCOA	COFFEE
1948	646000	5392000	495000	1619000
1949	1716000	5391000	540000	1932000
1950	2410000	4309000	562000	1462000
1951	2926000	4062000	305000	1578000
1952	3711000	7913000	272000	1728000
1953	3796000	6597000	296000	1889000
1954	4524000	5884000	269000	1489000
1955	4389000	6348000	229000	1717000
1956	4770000	6479000	234000	1697000
1957	4899000	6071000	284000	1719000
1958	5241000	8898000	221000	1816000
1959	5439000	6550000	247000	1953000
1960	5365000	5330000	264000	1805000

	TEA	WHISKY	CHEM.IND.2	AG.+AN.2
1948	8000	6256000	0	18962000
1949	35000	7395000	1000	20257000
1950	18000	5138000	1000	20261000
1951	18000	7683000	1000	26036000
1952	19000	11713000	1000	23904000
1953	18000	11123000	2000	30303000
1954	30000	8722000	3000	30341000
1955	22000	9643000	0	34251000
1956	24000	8803000	1000	37848000
1957	31000	7771000	1000	41478000
1958	28000	12740000	2000	42985000
1959	47000	12567000	2000	45184000
1960	38000	12401000	0	44238000

TABLE A.XIV (CONTINUED)

	N.METAL.2	CHEM.2	MISC.2	SOYABEANS
1948	0	50000	20000	0
1949	0	53000	21000	0
1950	0	53000	21000	0
1951	0	68000	27000	0
1952	0	63000	25000	0
1953	0	80000	32000	0
1954	0	80000	32000	0
1955	0	90000	36000	0
1956	0	99000	40000	0
1957	0	109000	44000	0
1958	0	113000	45000	0
1959	0	119000	47000	0
1960	0	116000	46000	0

	FURS	COTTON R.	WOOL R.	WOOL T.
1948	0	0	90000	46000
1949	0	0	92000	51000
1950	0	0	148000	33000
1951	0	0	19000	53000
1952	0	0	4000	11000
1953	0	0	1000	43000
1954	0	0	0	28000
1955	0	0	0	3000
1956	0	0	0	1000
1957	0	0	0	1000
1958	0	0	0	0
1959	0	0	0	3000
1960	0	0	0	0

	SISAL	SYNTH.3	PAPERBD.3	IRON O.
1948	0	31000	0	0
1949	0	67000	0	0
1950	0	164000	0	0
1951	0	684000	0	0
1952	0	213000	0	0
1953	0	273000	0	0
1954	0	181000	0	0
1955	0	350000	0	0
1956	0	463000	0	0
1957	0	677000	0	0
1958	0	306000	0	0
1959	0	453000	0	0
1960	0	583000	1000	0

TABLE A.XIV (CONTINUED)

	COAL ANTH.	COAL BIT.	PETROLEUM	RUBBER 3
1948	60000	12591000	0	48000
1949	8000	8718000	0	45000
1950	3000	8477000	0	96000
1951	1000	8982000	0	102000
1952	0	7884000	0	54000
1953	1000	7298000	0	49000
1954	2000	5846000	0	90000
1955	8000	5768000	0	150000
1956	16000	7083000	0	161000
1957	3000	5840000	0	102000
1958	2000	4166000	0	86000
1959	38000	3624000	0	109000
1960	0	3575000	0	65000

	AG.+AN.3	TEXTILES 3	WOOD 3	IRON 3
1948	816000	20000	0	0
1949	872000	21000	0	0
1950	872000	21000	0	0
1951	1121000	27000	0	0
1952	1029000	25000	0	0
1953	1304000	32000	0	0
1954	1306000	32000	0	0
1955	1474000	36000	0	0
1956	1629000	40000	0	0
1957	1785000	44000	0	0
1958	1850000	45000	0	0
1959	1945000	47000	0	0
1960	1904000	46000	0	0

	N.FERR.3	N.METAL.3	CHEM.3	MISC.3
1948	0	358000	0	0
1949	0	383000	0	0
1950	0	383000	0	0
1951	0	492000	0	0
1952	0	452000	0	0
1953	0	573000	0	0
1954	0	573000	0	0
1955	0	647000	0	0
1956	0	715000	0	0
1957	0	784000	0	0
1958	0	812000	0	0
1959	0	854000	0	0
1960	0	836000	0	0

TABLE A.XIV (CONTINUED)

	VEGET.OILS	COTTON F.	JUTE F.	WORSTEDS
1948	1212000	3761000	9000	4900000
1949	2480000	3332000	5000	4855000
1950	2251000	8220000	22000	3890000
1951	3126000	9267000	21000	4089000
1952	1938000	9728000	17000	3467000
1953	2035000	10166000	10000	4683000
1954	1940000	8253000	6000	3302000
1955	1784000	9785000	3000	3450000
1956	1876000	11363000	3000	4544000
1957	1963000	11986000	2000	4482000
1958	1986000	11931000	2000	3829000
1959	1900000	13279000	2000	4285000
1960	2078000	15048000	3000	4349000

	SYNTHET.4	PAPERBD.4	ROLL.MILL	TIN BL.
1948	2109000	2047000	7636000	0
1949	2043000	2425000	8506000	0
1950	2575000	2545000	7311000	0
1951	3751000	3965000	14663000	0
1952	6650000	3981000	11562000	0
1953	7478000	5743000	10404000	0
1954	7113000	4673000	7969000	0
1955	8068000	5452000	10834000	0
1956	8516000	7023000	18285000	0
1957	10065000	7780000	14920000	0
1958	10026000	8817000	11420000	1000
1959	10491000	9312000	9468000	0
1960	10314000	9388000	9448000	0

	BRICKS	GLASS	GASOLINE	FERTILIZ.
1948	729000	1154000	5740000	8000
1949	854000	875000	3272000	7000
1950	858000	980000	4422000	8000
1951	1118000	1267000	4261000	9000
1952	1052000	539000	5363000	14000
1953	1240000	475000	5313000	17000
1954	1199000	416000	4875000	18000
1955	1507000	538000	5182000	22000
1956	1845000	689000	5195000	26000
1957	1411000	462000	4883000	48000
1958	1375000	680000	4751000	47000
1959	1586000	883000	5545000	55000
1960	1605000	792000	4353000	38000

TABLE A.XIV (CONTINUED)

	PAINT 4	IND.CHEM.4	RUBBER 4	AG.+AN.4
1948	1445000	3501000	397000	1155000
1949	1405000	3547000	775000	1233000
1950	1743000	3882000	864000	1234000
1951	2041000	4780000	2330000	1585000
1952	1629000	2629000	1316000	1456000
1953	1918000	8136000	2597000	1845000
1954	2244000	4177000	2439000	1848000
1955	2181000	4632000	3272000	2086000
1956	2461000	4774000	3509000	2305000
1957	2066000	4308000	3528000	2526000
1958	1980000	3637000	3271000	2617000
1959	2147000	2585000	4355000	2751000
1960	2144000	3695000	4210000	2694000

	TEXTILES 4	WOOD 4	IRON 4	N.FERR.4
1948	7376000	1364000	8421000	5067000
1949	7879000	1457000	8996000	5412000
1950	7881000	1457000	8998000	5414000
1951	10128000	1872000	11563000	6957000
1952	9298000	1719000	10616000	6387000
1953	11787000	2179000	13457000	8097000
1954	11802000	2182000	13474000	8107000
1955	13323000	2463000	15211000	9152000
1956	14722000	2722000	16808000	10113000
1957	16134000	2983000	18420000	11083000
1958	16720000	3091000	19089000	11485000
1959	17576000	3249000	20066000	12073000
1960	17207000	3181000	19646000	11820000

	N.METALL.4	CHEM.4	MISCELL.4	NEWSPAPERS
1948	3534000	6550000	189000	475000
1949	3775000	6997000	202000	546000
1950	3776000	6998000	202000	567000
1951	4852000	8993000	260000	611000
1952	4455000	8257000	238000	665000
1953	5647000	10467000	302000	800000
1954	5654000	10480000	303000	845000
1955	6383000	11831000	342000	855000
1956	7053000	13073000	377000	873000
1957	7730000	14327000	414000	1038000
1958	8010000	14847000	429000	891000
1959	8420000	15607000	451000	998000
1960	8244000	15280000	441000	896000

TABLE A.XIV (CONTINUED)

	PAPERBD.5	FARM MACH.	MACHINERY	AUTOMOBILE
1948	1054000	320000	26419000	5934000
1949	624000	278000	24257000	5405000
1950	1612000	163000	25643000	18972000
1951	2004000	212000	35079000	36362000
1952	1439000	229000	36045000	33152000
1953	1588000	260000	40620000	40575000
1954	3380000	293000	39065000	32801000
1955	3999000	296000	47185000	46783000
1956	4328000	330000	65101000	58489000
1957	3634000	385000	64627000	47714000
1958	3078000	507000	51348000	44307000
1959	3212000	431000	58240000	51750000
1960	3365000	391000	58585000	54181000

	ELECTRIC	CHINA	PAINT 5	IND.CHEM.5
1948	11732000	461000	14000	15000
1949	13239000	574000	13000	13000
1950	14817000	533000	14000	23000
1951	21925000	592000	15000	36000
1952	25494000	499000	25000	56000
1953	34219000	479000	55000	108000
1954	36028000	501000	62000	86000
1955	39688000	596000	46000	120000
1956	45604000	596000	50000	84000
1957	43636000	676000	60000	68000
1958	38883000	659000	70000	81000
1959	46176000	587000	100000	96000
1960	40802000	609000	104000	122000

	CONS.GOODS	RUBBER 5	AG.+AN.5	TEXTILES 5
1948	3801000	767000	1254000	11148000
1949	5262000	558000	1340000	11909000
1950	13452000	648000	1340000	11912000
1951	13142000	1229000	1722000	15307000
1952	29245000	2008000	1581000	14054000
1953	20761000	2013000	2004000	17816000
1954	17501000	1574000	2007000	17838000
1955	16834000	2550000	2265000	20137000
1956	38172000	3312000	2503000	22252000
1957	19758000	2849000	2743000	24386000
1958	20795000	3259000	2843000	25272000
1959	20897000	4431000	2989000	26565000
1960	18945000	4434000	2926000	26008000

TABLE A.XIV (CONTINUED)

	WOOD 5	IRON 5	N.FERR.5	N.METALL.5
1948	3504000	15030000	3464000	2359000
1949	3743000	16056000	3700000	2520000
1950	3744000	16060000	3701000	2521000
1951	4811000	20638000	4756000	3239000
1952	4417000	18948000	4367000	2974000
1953	5599000	24020000	5536000	3770000
1954	5606000	24050000	5543000	3775000
1955	6329000	27149000	6257000	4261000
1956	6994000	30001000	6914000	4709000
1957	7664000	32878000	7577000	5160000
1958	7943000	34072000	7852000	5348000
1959	8349000	35815000	8254000	5621000
1960	8174000	35065000	8081000	5504000

	CHEM.5	MISCELL.5
1948	3683000	5216000
1949	3934000	5572000
1950	3935000	5573000
1951	5057000	7162000
1952	4643000	6575000
1953	5886000	8335000
1954	5893000	8346000
1955	6652000	9421000
1956	7351000	10411000
1957	8056000	11409000
1958	8349000	11824000
1959	8776000	12429000
1960	8592000	12168000

TABLE A.XIV (CONTINUED)
2. SUBPERIOD 1960-1968

	F.FRUITS	F.VEGET.	SUGAR	COCOA
1960	3194000	4651000	5330000	264000
1961	3364000	4487000	5523000	283000
1962	3772000	4478000	5508000	297000
1963	3051000	4706000	6885000	282000
1964	3097000	4484000	5330000	297000
1965	3555000	4883000	7319000	373000
1966	3683000	5769000	6993000	209000
1967	3568000	5588000	7883000	277000

	COFFEE	TEA	IND.CORN	SOYABEANS
1960	1805000	38000	1196000	0
1961	1833000	51000	1816000	0
1962	2029000	33000	3214000	0
1963	1988000	73000	1843000	0
1964	1996000	3000	1659000	0
1965	1887000	1000	1454000	0
1966	1612000	3000	1610000	0
1967	1797000	3000	2330000	0

	FURS	HIDES	COTTON R	WOOL R
1960	0	0	0	0
1961	0	0	0	0
1962	0	0	0	0
1963	0	0	0	1000
1964	0	1000	0	0
1965	0	0	0	0
1966	0	1000	0	0
1967	1000	2000	0	0

	WOOL T.	SYNTHETICS	IRON ORE	BAUX.+AL.
1960	0	580000	7000	0
1961	0	706000	6000	0
1962	0	762000	6000	2000
1963	2000	660000	8000	5000
1964	2000	936000	6000	12000
1965	1000	1088000	22000	0
1966	0	1434000	10000	6000
1967	2000	1217000	6000	19000

TABLE A.XIV (CONTINUED)

	COAL ANT.	COAL BIT.	PETROLEUM	RUBBER
1960	0	3162000	0	71000
1961	0	2999000	0	47000
1962	0	2970000	0	37000
1963	0	3295000	0	17000
1964	0	4187000	0	112000
1965	0	4811000	0	135000
1966	1000	4644000	0	84000
1967	113000	4503000	0	69000

	VEGET.OILS	COTTON F.	JUTE F.	WORSTEDS
1960	1136000	15216000	73000	4349000
1961	1518000	15371000	93000	5113000
1962	1377000	15530000	123000	5877000
1963	1351000	13847000	159000	4618000
1964	1490000	20185000	136000	5042000
1965	2103000	13813000	116000	5297000
1966	2402000	16455000	121000	4852000
1967	1331000	15336000	157000	4864000

	PAPERBOARD	ROLL.MILL	TIN BLOCKS	GLASS
1960	7745000	10253000	0	823000
1961	8349000	8512000	0	929000
1962	8760000	10376000	0	1712000
1963	8083000	9761000	0	1331000
1964	8712000	15243000	0	1346000
1965	9045000	20184000	1000	1355000
1966	9633000	13847000	0	1345000
1967	8841000	13262000	0	1267000

	GASOLINE	FERTILIZER	IND.CHEM.	FARM MACH.
1960	898000	96000	944000	269000
1961	623000	110000	1015000	271000
1962	516000	111000	1007000	372000
1963	857000	90000	950000	305000
1964	845000	99000	8643000	396000
1965	812000	83000	6225000	364000
1966	898000	86000	7009000	390000
1967	1417000	99000	7684000	408000

TABLE A.XIV (CONTINUED)

	MACHINERY	AUTOMOBILE	ELECTRIC	LIVE ANIM.
1960	51493000	56178000	36616000	434000
1961	51060000	50944000	38635000	456000
1962	68259000	69009000	52927000	483000
1963	64397000	81576000	45054000	609000
1964	78236000	78363000	48205000	1054000
1965	105466000	40918000	41594000	595000
1966	106567000	33882000	45938000	668000
1967	104125000	33774000	78689000	1108000

	SECTION 2	SECTION 3	SECTION 4	SECTION 5
1960	74489000	6696000	145991000	296062000
1961	76574000	6325000	151280000	298260000
1962	82474000	6764000	175874000	376929000
1963	76788000	6734000	166926000	349266000
1964	77740000	7874000	185395000	373797000
1965	88747000	8881000	207447000	385356000
1966	95655000	9980000	215907000	430136000
1967	103799000	10226000	230980000	467055000

TABLE A.XIV (CONTINUED)
3. SUBPERIOD 1968-1972

	F.FRUITS	F.VEGET.	SUGAR	COCOA
1967	3568000	5588000	7883000	277000
1968	3704000	5802000	6862000	11000
1969	4156000	5684000	8354000	0
1970	3740000	5951000	9615000	0
1971	3784000	6131000	8055000	0
1972	3945000	6501000	6745000	0

	COFFEE	TEA	IND.CORN	MEAT
1967	1797000	3000	2330000	1354000
1968	26000	0	2466000	1806000
1969	0	0	2091000	4543000
1970	0	0	1457000	4768000
1971	0	0	1369000	4866000
1972	0	0	1322000	5116000

	SOYABEANS	HIDES	COTTON R.	WOOL R.
1967	0	2000	0	0
1968	0	0	0	0
1969	0	1000	0	7000
1970	0	0	0	0
1971	0	10000	0	0
1972	0	20000	0	1000

	WOOL TOPS	IRON ORE	BAUX.+AL.	COPPER ORE
1967	2000	6000	19000	47000
1968	6000	6000	12000	6000
1969	0	2000	13000	0
1970	2000	5000	5000	1000
1971	52000	22000	8000	1000
1972	104000	40000	12000	2000

	COAL BIT.	PETROLEUM	RUBBER	COTTON F.
1967	4503000	0	69000	15336000
1968	3567000	0	24000	10989000
1969	796000	0	23000	11132000
1970	0	0	25000	9536000
1971	0	346000	36000	12689000
1972	0	710000	49000	16721000

TABLE A.XIV (CONTINUED)

	JUTE F.	WORSTEDS	COATED F.	VENEERS
1967	157000	4864000	6447000	4904000
1968	100000	5377000	7927000	5286000
1969	99000	5428000	9190000	6630000
1970	75000	4779000	9953000	4250000
1971	77000	4090000	11207000	6716000
1972	84000	3684000	13236000	9647000

	ROLL.MILL	TIN BLOCKS	GASOLINE	HEAVY FUEL
1967	13262000	0	1417000	4272000
1968	11865000	0	1430000	3707000
1969	19222000	17000	2142000	3816000
1970	16095000	0	1781000	3961000
1971	18849000	5000	1320000	1985000
1972	22906000	10000	951000	146000

	IND.CHEM.	INOR.CHEM.	ORG.CHEM.	FARM MACH.
1967	7684000	5702000	7615000	408000
1968	7816000	5736000	8087000	275000
1969	9195000	6210000	9275000	540000
1970	9155000	5939000	9208000	614000
1971	10278000	6179000	9883000	585000
1972	12109000	6848000	11241000	657000

	DRILLING	AUTOMOBILE	ELECTRICAL	LIVE ANIM.
1967	10381000	33774000	78689000	1108000
1968	8126000	41134000	72274000	670000
1969	11823000	49530000	83934000	551000
1970	12091000	49456000	79004000	1094000
1971	15092000	65733000	92670000	1451000
1972	20692000	93339000	122305000	1467000

	SECTION 2	SECTION 3	SECTION 4	SECTION 5
1967	103799000	10226000	230980000	467055000
1968	95309000	9649000	230575000	457530000
1969	115742000	5043000	265027000	522842000
1970	112862000	3693000	251860000	521551000
1971	119738000	5156000	282283000	590218000
1972	130319000	6875000	332223000	760573000

TABLE A.XV RE-EXPORTS, DISAGGREGATED SERIES, 1948-1972
1. SUBPERIOD 1948-1960

	WHEAT	BARLEY	WHISKY	WHEAT FL.
1948	0	0	2000	6000
1949	0	0	3000	0
1950	0	0	6000	0
1951	0	0	24000	0
1952	0	0	134000	0
1953	0	0	7000	0
1954	0	0	4000	0
1955	0	0	12000	0
1956	0	0	22000	0
1957	1000	0	7000	0
1958	0	0	20000	0
1959	0	0	49000	0
1960	0	0	0	0

	OATS	TOBACCO	BEEF	CATTLE S
1948	0	2000	0	0
1949	0	0	0	0
1950	29000	0	0	0
1951	43000	58000	10000	0
1952	0	3000	0	0
1953	0	0	0	0
1954	0	0	7000	0
1955	7000	0	63000	0
1956	1000	0	0	0
1957	0	2000	5000	0
1958	0	2000	35000	0
1959	0	9000	35000	1000
1960	0	9000	58000	0

	CATTLE D	MILK	EGGS	FISH 2
1948	16000	0	0	250000
1949	10000	0	0	70000
1950	5000	0	0	15000
1951	40000	0	7000	23000
1952	4000	2000	0	529000
1953	27000	0	0	24000
1954	42000	0	5000	77000
1955	103000	0	1000	175000
1956	20000	12000	5000	171000
1957	121000	0	0	367000
1958	50000	0	0	202000
1959	24000	6000	0	161000
1960	65000	0	4000	348000

TABLE A.XV (CONTINUED)

	AG.+AN.2	CHEM.2	MISCELL.2	FISH 3
1948	1669000	19000	0	0
1949	1347000	15000	0	0
1950	1920000	14000	0	0
1951	1949000	24000	0	0
1952	3835000	21000	0	0
1953	2416000	20000	0	0
1954	2698000	20000	0	0
1955	4190000	22000	0	0
1956	3310000	25000	0	0
1957	2729000	31000	0	0
1958	2797000	56000	0	0
1959	3214000	47000	0	0
1960	3391000	66000	0	0

	LEATHER 3	FURS	HIDES	PULPWOOD
1948	0	587000	22000	0
1949	0	539000	0	0
1950	0	734000	0	0
1951	2000	887000	0	0
1952	1000	1243000	0	0
1953	5000	712000	15000	0
1954	1000	973000	13000	0
1955	1000	690000	20000	0
1956	0	816000	0	23000
1957	0	837000	0	0
1958	0	667000	21000	0
1959	0	685000	0	721000
1960	5000	515000	41000	1103000

	IRON ORE	COPPER 3	LEAD 3	ALUMINUM 3
1948	0	0	0	0
1949	0	0	0	0
1950	0	0	0	0
1951	0	0	0	0
1952	0	0	0	0
1953	0	0	0	0
1954	0	0	0	0
1955	0	0	0	0
1956	0	151000	0	7000
1957	0	87000	0	4000
1958	10000	4000	0	1000
1959	24000	16000	0	0
1960	0	2000	0	0

TABLE A.XV (CONTINUED)

	NICKEL 3	ZINC 3	SILVER 3	PLATINUM
1948	0	0	0	7000
1949	0	0	0	34000
1950	0	0	0	0
1951	0	0	0	121000
1952	0	16000	0	42000
1953	0	0	0	37000
1954	0	7000	0	98000
1955	0	10000	0	18000
1956	0	0	0	7000
1957	0	0	0	40000
1958	0	31000	0	4894000
1959	0	0	0	8677000
1960	0	0	0	8453000

	ASBESTOS	COAL	AG.+AN.3	TEXTILES 3
1948	1000	97000	107000	1600000
1949	0	29000	86000	2093000
1950	0	152000	123000	2211000
1951	17000	17000	125000	4583000
1952	10000	16000	245000	2721000
1953	26000	11000	154000	2074000
1954	46000	17000	173000	2146000
1955	0	9000	268000	1512000
1956	0	14000	212000	1795000
1957	0	27000	175000	1447000
1958	0	10000	179000	1647000
1959	4000	109000	206000	1567000
1960	6000	5000	217000	3447000

	WOOD 3	IRON 3	N.FERR.3	N.METALL.3
1948	26000	6000	125000	2990000
1949	20000	6000	115000	2921000
1950	20000	8000	238000	3968000
1951	25000	7000	224000	3565000
1952	21000	12000	302000	4508000
1953	28000	15000	350000	5320000
1954	26000	20000	366000	5198000
1955	30000	21000	419000	6518000
1956	37000	26000	419000	5792000
1957	41000	45000	501000	9074000
1958	48000	54000	759000	5455000
1959	52000	65000	628000	5020000
1960	67000	63000	918000	4247000

TABLE A.XV (CONTINUED)

	MISCELL.3	FISH 4	LEATHER 4	NEWSPRINT
1948	6000	7000	32000	0
1949	7000	0	57000	0
1950	8000	0	93000	0
1951	6000	2000	161000	0
1952	10000	2000	32000	0
1953	12000	4000	164000	0
1954	19000	0	124000	0
1955	14000	0	128000	0
1956	15000	13000	136000	0
1957	14000	25000	150000	0
1958	17000	39000	172000	0
1959	17000	13000	227000	0
1960	17000	15000	231000	0

	WOOD PULP	PLANKS	SHINGLES	PLYWOOD
1948	0	73000	0	3000
1949	2000	18000	0	0
1950	6000	61000	0	1000
1951	43000	18000	0	1000
1952	1000	20000	0	0
1953	100000	14000	0	1000
1954	2000	14000	0	0
1955	0	57000	0	1000
1956	0	96000	0	10000
1957	2000	95000	1000	8000
1958	0	73000	0	9000
1959	0	98000	0	40000
1960	0	88000	0	7000

	PIG IRON	COPPER 4	LEAD 4	ALUMINUM 4
1948	0	0	0	165000
1949	0	1000	0	6000
1950	0	0	20000	35000
1951	39000	4000	483000	76000
1952	0	0	0	7000
1953	0	0	0	46000
1954	0	29000	3000	92000
1955	96000	83000	0	30000
1956	0	63000	0	42000
1957	0	126000	0	27000
1958	0	10000	0	53000
1959	0	62000	0	33000
1960	0	3000	0	126000

TABLE A.XV (CONTINUED)

	NICKEL 4	ZINC 4	SILVER 4	ABRASIVES
1948	0	1000	285000	4000
1949	2000	1000	0	1000
1950	10000	0	0	1000
1951	57000	1000	602000	12000
1952	0	2000	0	3000
1953	0	1000	0	7000
1954	0	0	0	7000
1955	0	0	0	4000
1956	0	0	0	4000
1957	0	0	0	9000
1958	0	0	5000	6000
1959	0	0	0	13000
1960	0	0	0	1000

	FERTILIZER	AG.+AN.4	TEXTILES 4	WOOD 4
1948	0	356000	1159000	214000
1949	48000	288000	1516000	168000
1950	0	410000	1601000	161000
1951	9000	416000	3319000	209000
1952	1000	819000	1970000	175000
1953	34000	516000	1502000	233000
1954	208000	576000	1554000	210000
1955	207000	895000	1095000	246000
1956	67000	707000	1300000	305000
1957	175000	583000	1048000	337000
1958	139000	597000	1193000	396000
1959	316000	686000	1135000	430000
1960	63000	724000	2496000	551000

	IRON 4	N.FERR.4	N.METALL.4	CHEM.4
1948	278000	415000	1251000	1514000
1949	264000	380000	1222000	1170000
1950	360000	790000	1660000	1100000
1951	328000	743000	1491000	1893000
1952	513000	999000	1886000	1605000
1953	680000	1161000	2226000	1537000
1954	893000	1215000	2175000	1557000
1955	934000	1388000	2727000	1696000
1956	1160000	1389000	2423000	1947000
1957	1991000	1660000	3796000	2437000
1958	2368000	2516000	2282000	4377000
1959	2854000	2083000	2100000	3660000
1960	2773000	3042000	1777000	5151000

TABLE A.XV (CONTINUED)

	MISCELL.4	FARM MACH.	MACHINERY	AUTOMOBILE
1948	0	440000	7123000	2295000
1949	0	721000	3514000	1710000
1950	0	952000	5009000	2492000
1951	0	1147000	6865000	6042000
1952	0	1481000	7201000	5619000
1953	0	945000	8556000	3316000
1954	0	2053000	9167000	3490000
1955	0	1417000	11451000	4562000
1956	0	1274000	12104000	3569000
1957	0	1697000	16853000	3843000
1958	0	1379000	15905000	2905000
1959	0	1269000	20492000	3477000
1960	0	2352000	22580000	4257000

	AG.+AN.5	TEXTILES 5	WOOD 5	IRON 5
1948	350000	166000	570000	3211000
1949	283000	217000	447000	3047000
1950	403000	229000	428000	4149000
1951	409000	475000	555000	3787000
1952	804000	282000	466000	5919000
1953	507000	215000	620000	7849000
1954	566000	222000	558000	10304000
1955	879000	157000	655000	10779000
1956	694000	186000	811000	13384000
1957	572000	150000	897000	22976000
1958	587000	171000	1054000	27326000
1959	674000	162000	1143000	32935000
1960	711000	357000	1465000	31999000

	N.FERR.5	N.METALL.5	CHEM.5	MISCELL.5
1948	1176000	189000	134000	4577000
1949	1078000	184000	104000	4748000
1950	2241000	250000	97000	5953000
1951	2109000	225000	168000	4544000
1952	2835000	285000	142000	7026000
1953	3293000	336000	136000	8637000
1954	3446000	328000	138000	13375000
1955	3938000	411000	150000	9705000
1956	3942000	366000	172000	10805000
1957	4709000	573000	216000	10241000
1958	7139000	344000	388000	12353000
1959	5910000	317000	324000	12406000
1960	8630000	268000	456000	12450000

TABLE A.XV (CONTINUED)
2. SUBPERIOD 1960-1968

	WHEAT	BARLEY	WHISKY	WHEAT FL.
1960	0	0	0	0
1961	0	0	104000	0
1962	2000	0	0	0
1963	0	0	1000	0
1964	0	0	0	0
1965	49000	0	0	0
1966	6000	0	0	0
1967	0	3000	0	0

	OATS	TOBACCO	BEEF	MILK
1960	0	9000	58000	0
1961	5000	12000	69000	2000
1962	31000	6000	66000	4000
1963	194000	10000	594000	9000
1964	0	12000	572000	1000
1965	1000	37000	258000	698000
1966	0	73000	320000	2000
1967	0	7000	425000	0

	EGGS	FISH	CHEESE	FURS
1960	0	230000	26000	501000
1961	20000	431000	17000	1012000
1962	1000	257000	12000	551000
1963	73000	275000	10000	915000
1964	18000	697000	34000	781000
1965	53000	419000	12000	1090000
1966	25000	262000	131000	1056000
1967	61000	572000	281000	816000

	HIDES	PULPWOOD	IRON ORE	PLATINUM
1960	41000	1103000	0	0
1961	0	879000	0	419000
1962	0	973000	1000	67000
1963	6000	995000	0	13000
1964	1000	605000	0	40000
1965	63000	411000	2000	460000
1966	0	473000	0	407000
1967	0	424000	0	337000

TABLE A.XV (CONTINUED)

	ASBESTOS	COAL	LEATHER	NEWSPRINT
1960	6000	5000	232000	0
1961	121000	3000	223000	2000
1962	35000	36000	229000	1000
1963	49000	2000	182000	0
1964	4000	27000	196000	0
1965	40000	47000	262000	0
1966	5000	57000	243000	0
1967	2000	55000	302000	0

	WOOD PULP	LUMBER	SHINGLES	PLYWOOD
1960	0	88000	0	7000
1961	40000	61000	0	28000
1962	3000	71000	0	35000
1963	0	82000	0	48000
1964	0	53000	0	29000
1965	10000	216000	0	93000
1966	27000	146000	0	33000
1967	10000	136000	0	57000

	PIG IRON	ROLL.MILL	COPPER	ALUMINUM
1960	0	852000	3000	257000
1961	0	506000	4000	79000
1962	0	682000	17000	236000
1963	8000	611000	4000	154000
1964	0	465000	6000	406000
1965	0	943000	46000	393000
1966	0	504000	102000	745000
1967	0	685000	113000	1333000

	NICKEL	ZINC	ABRASIVES	FERTILIZER
1960	0	0	13000	63000
1961	23000	0	59000	33000
1962	7111000	0	81000	129000
1963	12491000	0	61000	8000
1964	17640000	0	70000	22000
1965	21473000	0	183000	30000
1966	15861000	0	201000	11000
1967	19095000	0	322000	5000

TABLE A.XV (CONTINUED)

	ELECTRICITY	FARM MACH.	MACHINERY	AUTOMOBILE
1960	0	5514000	23941000	10825000
1961	0	7422000	24109000	6318000
1962	0	5097000	28294000	6732000
1963	0	6078000	29594000	8551000
1964	0	8868000	31934000	15469000
1965	0	8837000	40760000	19649000
1966	0	8185000	46498000	25415000
1967	0	9610000	50266000	30972000

	CONS.GOODS	RUBBER	LIVE ANIM.	SECTION 2
1960	657000	441000	259000	3571000
1961	1291000	233000	78000	5194000
1962	820000	200000	187000	5815000
1963	754000	168000	189000	7715000
1964	706000	275000	73000	8432000
1965	725000	650000	116000	10496000
1966	1318000	388000	121000	10091000
1967	1869000	576000	864000	11380000

	SECTION 3	SECTION 4	SECTION 5
1960	10773000	25950000	85067000
1961	8963000	21775000	99978000
1962	8926000	36019000	113568000
1963	9799000	43184000	114772000
1964	6333000	56872000	134604000
1965	8299000	57037000	160157000
1966	9208000	50207000	181480000
1967	7664000	56248000	216808000

TABLE A.XV (CONTINUED)
3. SUBPERIOD 1968-1972

	WHEAT	BARLEY	WHISKY	WHEAT FL.
1967	0	3000	0	0
1968	0	0	7000	0
1969	9000	0	45000	0
1970	0	0	62000	0
1971	0	0	21000	0
1972	954000	0	39000	0

	TOBACCO	BEEF	FISH	CHEESE
1967	7000	425000	572000	281000
1968	75000	322000	614000	35000
1969	27000	5042000	763000	212000
1970	47000	10979000	1125000	508000
1971	306000	177000	2214000	310000
1972	168000	908000	3227000	183000

	FURS	HIDES	PULPWOOD	IRON ORE
1967	816000	0	424000	0
1968	656000	0	185000	0
1969	699000	59000	58000	24000
1970	669000	1000	0	0
1971	1540000	149000	1000	0
1972	4212000	30000	0	0

	NICKEL	PLATINUM	ASBESTOS	PETROLEUM
1967	106000	337000	2000	0
1968	250000	151000	79000	0
1969	959000	398000	1000	0
1970	1469000	12000	3000	0
1971	66000	282000	2000	0
1972	50000	2000	1000	506000

	NAT.GAS	NEWSPRINT	WOOD PULP	LUMBER
1967	0	0	10000	136000
1968	0	1000	0	135000
1969	0	0	0	37000
1970	0	3000	8000	187000
1971	0	140000	151000	166000
1972	0	0	11000	246000

TABLE A.XV (CONTINUED)

	PIG IRON	ROLL.MILL	COPPER	ALUMINUM
1967	0	685000	113000	1333000
1968	0	632000	960000	2308000
1969	0	1260000	314000	974000
1970	117000	1651000	76000	1607000
1971	0	10831000	413000	1338000
1972	0	9047000	818000	1301000

	NICKEL	ZINC	ABRASIVES	CHEMICALS
1967	19095000	0	322000	2456000
1968	20587000	0	191000	1048000
1969	31321000	0	227000	1251000
1970	30934000	0	635000	6438000
1971	33183000	0	468000	25749000
1972	50836000	0	450000	9899000

	ELECTRICITY	FARM MACH.	MACHINERY	AUTOMOBILE
1967	0	9610000	50266000	31652000
1968	0	10670000	60867000	40153000
1969	0	11228000	75283000	51461000
1970	0	11493000	68730000	48088000
1971	0	12516000	64765000	45565000
1972	0	10584000	66761000	48761000

	CONS.GOODS	RUBBER	LIVE ANIM.	SECTION 2
1967	1869000	576000	864000	11380000
1968	1573000	977000	249000	11587000
1969	2965000	867000	235000	21430000
1970	3595000	1268000	435000	32071000
1971	3099000	1126000	419000	18643000
1972	4829000	1654000	194000	25851000

	SECTION 3	SECTION 4	SECTION 5
1967	7664000	56248000	216808000
1968	7574000	60384000	268205000
1969	10403000	77793000	314252000
1970	9294000	79433000	294321000
1971	8046000	119512000	275518000
1972	9966000	129260000	307499000