ECONOMIC DEVELOPMENT AND IMPORT DEPENDENCE IN JAPAN*

By KIYOSHI KOJIMA

Professor of International Economics

Problem

In the latest Japanese Five Year (1957–1962) Economic Plan, the ratio of imports to national income, or "import dependence" (expressed in 1955 constant prices), is estimated at 16.02% for the 1962 fiscal year (if imports are valued at C.I.F. prices, the result could be 16.2%).

This is roughly the same as the 15.66% import dependence figure realized during calender 1956, but is lower than the 17.18% of fiscal 1956 (April to March). Since import dependence is one of the crucial parametric variables in planning, it is most important that it should be estimated as accurately as possible.

To ascertain the optimum level of import dependence is an urgent problem for the Japanese economy. As compared with the pre-war situation, the import (and also the export) dependence has decreased to a considerable degree. Is this smaller dependence desirable or not? If we want to attain the pre-war level of import dependence, a huge expansion in exports is needed. If we could, however, maintain the rapid growth of our economy with a smaller import dependence, this would be much more desirable than a large expansion in exports. Trade is not a final object in itself but is a means of developing and stabilizing the national economy. Therefore, we must try to find the optimum import dependence, which would most efficiently promote the growth of the Japanese economy.

The purpose of this paper is to deduce an historical and empirical law from the behavior of Japan's import dependence from 1900 to the present. The anaylsis will make clear the important role which imports have played in Japanese economic growth. The law thus found will help in forecasting normal or possibly optimum import dependence for the coming few years.

Statistical data are presented in the appendix of this paper; some important comments are briefly noted here.

Firstly, pre-war trade includes Japan's transactions with Formosa and Korea.[1] Secondly, the pre-war national income figures come from *The Growth Rate of the Japanese*

* Originally this paper was prepared in the spring of 1958 on data available up to 1956. It is necessary and desirable to compare the predictions made in this paper with actual developments since then and thus to improve our projection. This will be done in a forthcoming paper.

[1] I am much indebted to Hisao Kanamori for his paper (in Japanese) *Japanese Economy and Import Dependence* (Analysis Series No. 9 of the Research Section, Economic Planning Agency, Japanese Government.) I am also indebted to members of the Trade Section, Planning Bureau, E. P. A., for their help in collecting much of the data and in doing the calculations.

Economy since 1878 by Kazushi Okawa and the post-war national income is estimated by the Economic Planning Agency. Thirdly, national income and imports are evaluated in real terms of 1913 prices for the pre-war period and in real terms of 1953 prices for the post-war period on the basis of the wholesale price index and import unit value index.[2]

Part I gives an aggregate analysis of Japanese import dependence, in which the national income or activity and the imports of the economy as a whole are regarded in terms of an aggregate volume. In part II, both the national income and imports are disaggregated into several sectors and the sectoral import dependences are examined. The sectoral analysis presented by this paper is the first of its kind to be made in Japan.

I. *Aggregate Analysis*

To begin with, I will analyse the relationship between the aggregate real national income, Y, and aggregate real imports, M. In Fig. 1, a few indices are taken to find the factors that determine the behavior of imports. Firstly, we can see a close correlation between the curve Y and the curve M. As expected, M is a function of Y. Secondly, we find, however, that two kinds of periods succeed each other alternately. One is "the stable period" of the import function, in which movements of both the average and the marginal propensity to import $\left(\frac{M}{Y} \text{ and } \frac{\Delta M}{\Delta Y}\right)$ follow a regular pattern. The other is the "period of structural change" in the import function in which two kinds of propensity experience drastic changes. The import function in each stable period is shown in Table 1 and Fig. 2·1 to Fig. 2·4.

(I–1) *Patterns in the movements of marginal and average propensity to import*

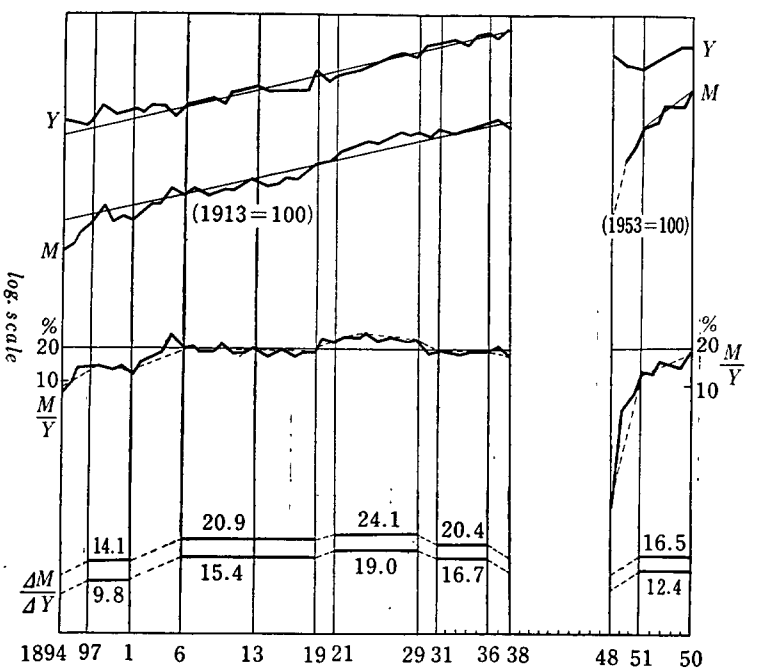
(a) In an import function $M=a+bY$, b is the marginal propensity to import $\frac{\Delta M}{\Delta Y}$, and a is an invariant which is shown as an intercept of the regression line. According to whether a is positive or negative, there are two patterns. Let us first consider pattern α. Suppose intercept a is positive (Fig. A). Marginal propensity to import $\frac{\Delta M}{\Delta Y}$ is shown as a slope of the line m, the import function, and average propensity to import (or import dependence) $\frac{M}{Y}$ as a slope of the line O_i, O_j, etc., drawn through the origin to the line m. In this case, it is clear that the larger the national income Y is, the smaller the average propensity to import $\frac{M}{Y}$ will be, for the slope O_j becomes smaller than O_i. If Y increases infinitely, $\frac{M}{Y}$ approaches $\frac{\Delta M}{\Delta Y}$ (though they will never coincide insofar as a is not zero). In other words, import dependence decreases from a high value at the beginning of the period to a lower value in the end as national

[2] The import dependence appears differently, depending on whether current value imports are divided by current value national income, or real value imports are divided by real value national income, and also according to which annual price levels are used to evaluate both the real national income and real imports. Various complications do not matter seriously in an analysis of historical changes in an economy's import dependence. But we must be careful of such complications when we want to make an international comparison of import dependence.

Table 1 *Import Function*

1)	1878 — 1886	$M = 0.017\,Y + 53.5$	$R = 0.737$
2)	1888 — 1894	$M = 0.075\,Y + 29.3$	$R = 0.909$
3)	1897 — 1901	$M = 0.098\,Y + 92.3$	$R = 0.681$
4)	1906 — 1919	$M = 0.154\,Y + 109.9$	$R = 0.865$
5)	1921 — 1929	$M = 0.190\,Y + 272.7$	$R = 0.944$
6)	1931 — 1936	$M = 0.204\,Y - 159.2$	$R = 0.965$
7)	1951 — 1955	$M = 0.165\,Y - 127.5$	$R = 0.953$
8)	1951 — 1956	$M = 0.207\,Y - 339.6$	$R = 0.940$

Fig. 1 *Trend of Economic Indices*



income grows year by year, and the marginal propensity to import will be the minimum to which the import dependence approaches.

$\varepsilon = \dfrac{\Delta M}{\Delta Y} \Big/ \dfrac{M}{Y}$ is the elasticity of imports with respect to national income, or, in short, the income elasticity of imports. Since $\dfrac{\Delta M}{\Delta Y}$ is smaller than $\dfrac{M}{Y}$, the income elasticity ε is smaller than 1 in pattern α.

Fig. 2·1 *Import Function, 1900's and 1910's*

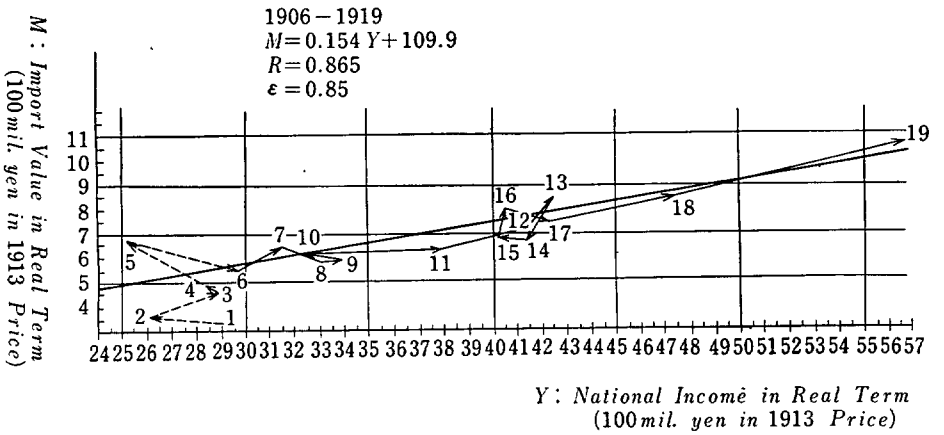
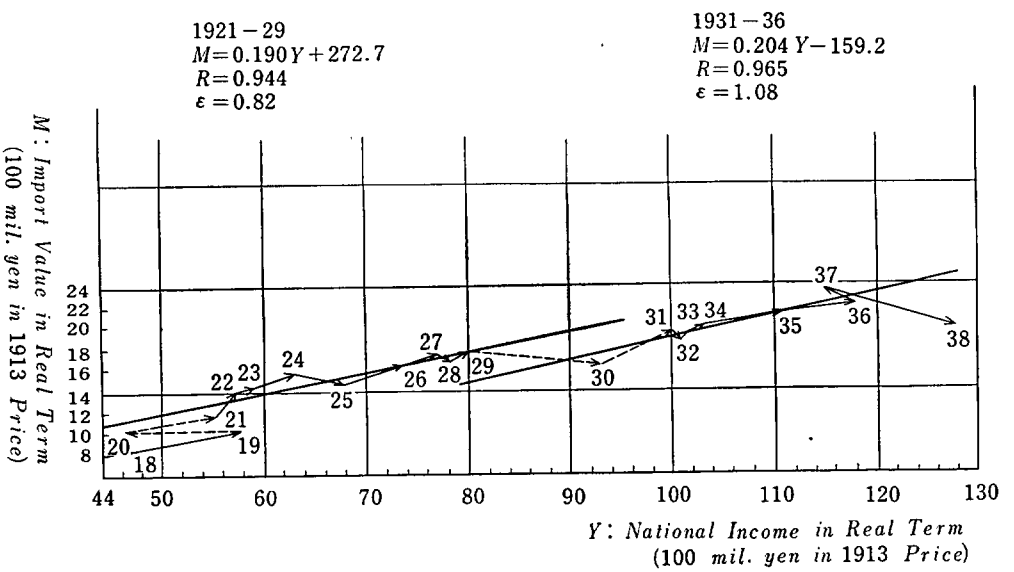


Fig. 2·2 *Import Function, 1920's*

Fig. 2·3 *Import Function, 1930's*



(b) Next, in pattern β, where intercept a is negative (Fig. B), the marginal propensity to import $\frac{\Delta M}{\Delta Y}$ should be a maximum to which the import dependence $\frac{M}{Y}$ approaches in increasing from low value to higher value as the national income grows, and the income elasticity of imports, ε, will be larger than 1.

Fig. 2·4 *Import Function, Postward Period*

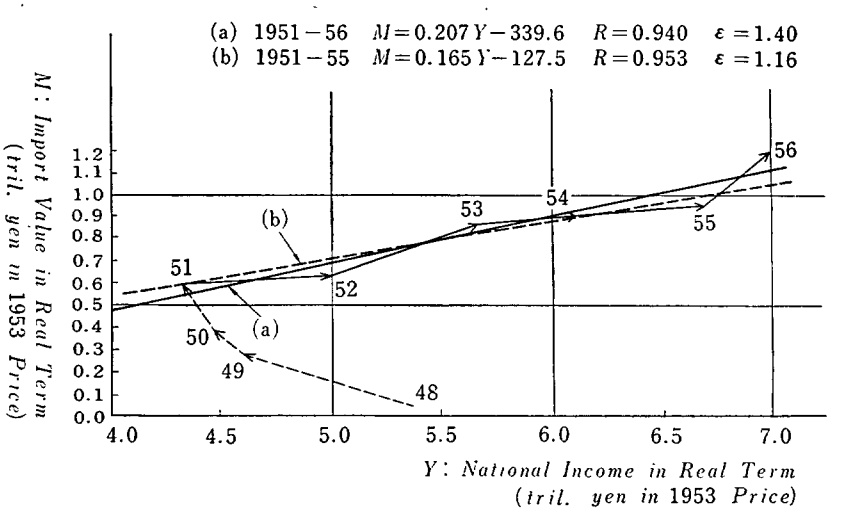


Fig. A

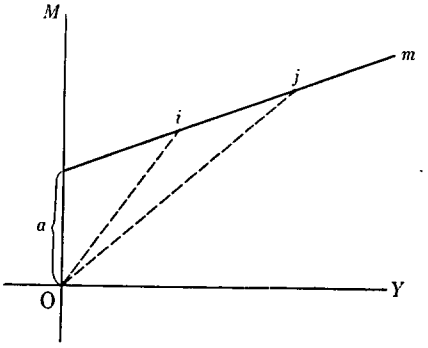
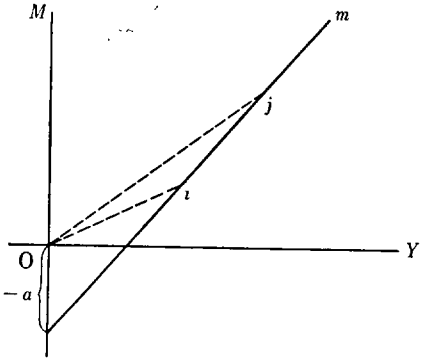


Fig. B



When the import dependence comes close to the marginal propensity to import, or when, idealistically, both coincide completely, it should represent the optimum import dependence. The condition is satisfied if the income elasticity ε comes close to 1. Why should this be so? National income Y, seen from another angle, means the utilization of domestic resources such as labor, capital and land, while imports mean the utilization of foreign resources. Therefore, when the intercept of the import function is positive, and the income elasticity ε during a specific period is smaller than 1, it can be interpreted, under the specific system of domestic and foreign technology, production, demand and price, that the economy starts this particular period of its growth with an under-utilization of domestic resources and an overdependence on foreign resources, since the positive intercept means that the economy needs some imports even if the national income is zero. The over-dependence on foreign resources at the beginning of a given period is necessary to

establish new industries and is stimulated by investments from foreign sources and favorable terms of trade. But, as time passes, the economy adapts itself to the new situation and corrects the mal-utilization of domestic resources. The overdependence on foreign resources is gradually decreased, and the average propensity to import decreases year by year, approaching the marginal propensity to import. Finally the economy will reach an optimum utilization of domestic and foreign resources when the average propensity to import coincides with the marginal propensity. This is the optimum import dependence. In fact, toward the end of each stable period, the Japanese economy attained the optimum import dependence. In case of pattern β, the economy approaches the optimum state, starting a period with an under-dependence on foreign resources.

The optimum utilization of domestic and foreign resources, however, cannot be continued for long. A structural change is needed and actually happens. An optimum situation is an ideal state in the sense of the static optimum, but further growth of the economy if it stays in such an optimum situation cannot be attained. Therefore, a growing economy like Japan's has to carry out successive structural changes in order to adapt itself to a rapidly changing world demand and an advanced technology and, thus, to create further space for growth.

To summarize our hypothesis or law, an economy passes through a stable period of import function, reaching an optimum situation, then undergoes a structural change in order to lift itself to a higher horizon, and passes through a second stable period.

Now let us examine whether the hypothesis is proved by our history of economic growth. If it is borne out, the hypothesis would be applicable to forecasting the future course of our import dependence.

Judging by the invariants of import functions in Table 1, the 1st to 5th periods (1921–1925) belong to pattern α, but the economy then changed to pattern β. These are successive stable periods in our sense. The marginal propensity to import calculated by the correlation method of each period is shown in the column (3) of Table 2 in parentheses. They should be the minimum of the import dependence in pattern α and the maximum in pattern β. A theoretical maximum of import dependence in pattern α or a similar minimum in pattern β, say $\left(\frac{\Delta M}{\Delta Y}\right)^*$, can be calculated by $\left(\frac{\Delta M}{\Delta Y}\right)^*_{t+1}=\left(\frac{\Delta M}{\Delta Y}\right)_t\cdot\left(\frac{M}{Y}\right)_{t+1}\Big/\left(\frac{M}{Y}\right)_t$ where $\left(\frac{M}{Y}\right)_{t+1}\Big/\left(\frac{M}{Y}\right)_t$ is one of shift parameters of import function. (The other parameter is $\left(\frac{\Delta M}{\Delta Y}\right)_{t+1}\Big/\left(\frac{\Delta M}{\Delta Y}\right)_t$). We obtain an average of those two values, or $\left[\left(\frac{\Delta M}{\Delta Y}\right)_{t+1}+\left(\frac{\Delta M}{\Delta Y}\right)^*_{t+1}\right]\div 2$, which is a theoretical period average of import dependence. By using these theoretical values as a norm, we can test the suitability of the import function. The import function is right if each realized yearly import dependence spreads in range between the theoretical maximum and minimum and the realized period average of import dependence is nearly equal to the theoretical period average.

Table 2 shows that, since the 4th (1906–1919) period during which our modern rapid industrialization started, our theoretical expectations have been borne out.

Firstly, the realized maximum, the minimum and the period average of $\frac{M}{Y}$ are nearly

Table 2 *Relation between* $\frac{M}{Y}$ *and* $\frac{\Delta M}{\Delta Y}$

(1) Period	(2) $\frac{M}{Y}$ %	(3) $\frac{\Delta M}{\Delta Y}$ %	(4) ε
1) 1878 — 86 (1886)	Max. 8.2 Min. 5.0 Av. 6.5	(1.7)	0.262
2) 1889 — 94 (1894)	Max. 10.3 Min. 8.6 Av. 9.3	10.7 (7.5) 9.1	0.806
3) 1897 — 1901 (1901)	Max. 14.5 Min. 11.5 Av. 13.4	14.1 (9.8) 12.0	0.731
4) 1906 — 19 (1914)	Max. 20.3 Min. 16.3 Av. 18.2	20.9 (15.4) 18.2	0.846
5) 1921 — 29 (1925)	Max. 25.2 Min. 21.8 Av. 23.1	24.1 (19.0) 21.6	0.823
6) 1931 — 36 (1934)	Min. 18.3 Max. 19.4 Av. 18.9	16.7 (20.4) 18.6	1.079
7) 1951 — 55 (1953)	Min. 12.8 Max. 15.4 Av. 14.2	12.4 (16.5) 14.4	1.162
8) 1951 — 56 (1956)	Min. 12.8 Max. 17.1 Av. 14.7	16.0 (20.7) 18.3	1.396

the same as those of $\frac{\Delta M}{\Delta Y}$ calculated, and the constant periodical marginal propensity to import (shown in brackets in the third column) regulated the movements in actual $\frac{M}{Y}$. Secondly, realized $\frac{M}{Y}$ declined in each period until the 5th period, and increased after the 6th period to approach the $\frac{\Delta M}{\Delta Y}$ shown in brackets. Thirdly, the period income elasticity of imports ε, which was about 0.8 from the 2nd to the 5th period, exceeded one after the 6th period. Fourthly, the actual yearly import dependence, $\frac{M}{Y}$, approached most closely to the $\frac{\Delta M}{\Delta Y}$ shown in brackets in the last year of the period until the 3rd period, and few years before the end of the period in the 4th through 7th periods. It may be assumed that these represented the optimum import dependence of each period. The year in which this was attained is shown in brackets in the first column in Table 2. In the 4th through 7th periods, therefore, the structural change took place not in the same year, but a few years after the optimum situation was attained.

In order to forecast the future, it is important to judge which is a normal marginal propensity to import in post-war years—either the 16.5% of 1951–1955 or the 20.7% of 1951–1956. I would forecast that for the next few years, the normal maximum of the marginal propensity to import may be 18.5%, the mean of the above two figures. There are a number of reasons for this forecast. First, 20.7% is something of an overvaluation since it includes the abnormally large imports of 1956. Our test is less suitable for the 1951–1956 period than it is for the 1951–1955 period. Secondly, 16.5% seems to be a little too low, since there are strong pressures tending to lift up our import dependence, as will be shown in the sector analysis. The actual maximum import dependence for the next few years will thus be about 17.5%, 1% below the marginal propensity, as it was in the prewar periods, and the period average of import dependence for 1951–1962 will be about 16%. If, following the practice of the New Five Year Economic Plan, we calculate on the basis of 1955 price levels, the answer would be smaller by about 1% than the above estimates.

(I–2) *Shifts in the import function due to the structural change of the propensity to import*

The degree of shift in the import function is shown by the ratio of period average of import dependence between one period and the next, or by $\left(\frac{M}{Y}\right)_{t+1}\Big/\left(\frac{M}{Y}\right)_t$.

Table 2 shows that the period average of import dependence, $\frac{M}{Y}$, increased rapidly up to the 5th period (6.5%, 9.3%, 13.4%, 18.2% and 23.1%), but it decreased to 18.9% (6th period) and to 14.2% (7th period). In other words, the import function moved upwards as far as the 5th period and then turned downwards. Correspondingly, the function turned from pattern α to pattern β.

Similarly, the marginal propensity to import, $\frac{\Delta M}{\Delta Y}$ increased (1.7%, 7.5%, 9.8%, 15.4%, 19.0% and 20.4%) up to the 6th period which would give the impression that it was the 6th period and not the 5th period to which the increase extended. However, it is correct for the $\frac{\Delta M}{\Delta Y}$ to begin decreasing from the 6th period, since the $\frac{\Delta M}{\Delta Y}$ in the 6th period was the maximum, not minimum as previous periods, of $\frac{M}{Y}$. Therefore, it is clear that, if you examine the period average of $\frac{\Delta M}{\Delta Y}$, it moves in a way similar to that of import dependence. Nineteen thirty was the demarcation year for changes in the direction of shifts in the import function. The main cause of the structural changes is the specialization in the textile industry before 1930 and the growth of heavy and chemical industries since 1930. If that is true, the further growth of the heavy and chemical industries in the post-war period would entail a depreciation of the import function as compared with the 1931–1936 period. It may be reasonable, therefore, to forecast that the period average of $\frac{M}{Y}$ will be 16% and that of $\frac{\Delta M}{\Delta Y}$ will be 18.5% in the period 1951–1962. The realized $\frac{\Delta M}{\Delta Y}$ in 1951–1956 was 20.7%, which should be thought rather abnormally high as far

as the depreciating trend is concerned, since it is almost the same as 20.4% in 1931–1936. We had better, therefore, forecast it at 18.5%.

II. *Sector Analysis*

It is usually pointed out that, because of the growth of heavy and tertiary (service) industries whose import dependence is smaller than that of the textile industry, our aggregate import depndence has decreased in comparison with pre-war days or that there is no reason why it should not be smaller. To prove this, a sector analysis is necessary. The national income will be disaggregated into primary, secondary and tertiary industries (Y_1, Y_2 and Y_3), and imports will similarly be divided into corresponding categories, thus enabling the sectoral import dependence to be calculated.

From the following analysis we will firstly be able to distinguish clearly trend factors and structural change factors in our aggregate import dependence. Secondly, the role played by imports in our economic growth will be clarified. Thirdly, we will be able to check our forecast in Part I by aggregating the sectoral import dependence.

(II–1) *Regularity in a sectoral import function*

Fig. 3 may help us determine regular factors. The period 1893–1907 in Fig. 3•1 shows current value indices, since we lack adequate price indices for this period, but other periods in Fig. 3•2 and Fig. 3•3 show real value indices. Straight lines added to M_r, Y_2+Y_3, Y_3, and Y_2 curves are parallel to the Y_2+Y_3 line which is so drawn as to connect points in 1906 and in 1929. It is clear that M_r, raw material imports which consist "raw material" and "semi-manufactured goods" in our import classification, moved in close correlation with Y_2, the manufacturing industry income. Therefore we can expect the raw material import function of secondary industry to have some regularity.

Table 3 shows the raw material import function in several periods. Among them functions in the 1st period (1909–1929), the 4th period (1930–1937) and the 6th period (1951–1955) can be selected as more normal than the remainder. There are a number of reasons for this.

Firstly, the 3rd and the 5th functions which have positive invariants may be omitted. The raw material import function should have a negative invariant, for imported raw materials are only a part of the necessary factors for production. Secondly, our test for the import function is applied to raw material import function, enabling us to arrive at Table 4 by a similar method to that which obtained Table 2.

We confirmed that the 1st, 2nd and 3rd periods of Table 4 conform with our test but that the 4th, 1a and 1b periods do not. Since the raw material import functions we chose satisfied our test, they shifted as regularly as the aggregate import functions did, and it can therefore be said that they acted as a most important regulator in the behavior of the aggregate import functions.

We thus chose the 1951–1955 function as a more normal one than the 1951–1956 function. But even in the 1951–1955 function, the marginal propensity to import of raw materials, 37.1%, deviates substantially from the 26.2% average and the income elasticity of raw material imports, ε, is still high (1.416).

Fig. 3 *Regular Factors*

Fig. 3 · 1 1893–1907 (*in current Price*)

Fig. 3 · 2 1903–38 (*in* 1913 *Price*)

Fig. 3 · 3 1948–56 (*in* 1953 *Price*)

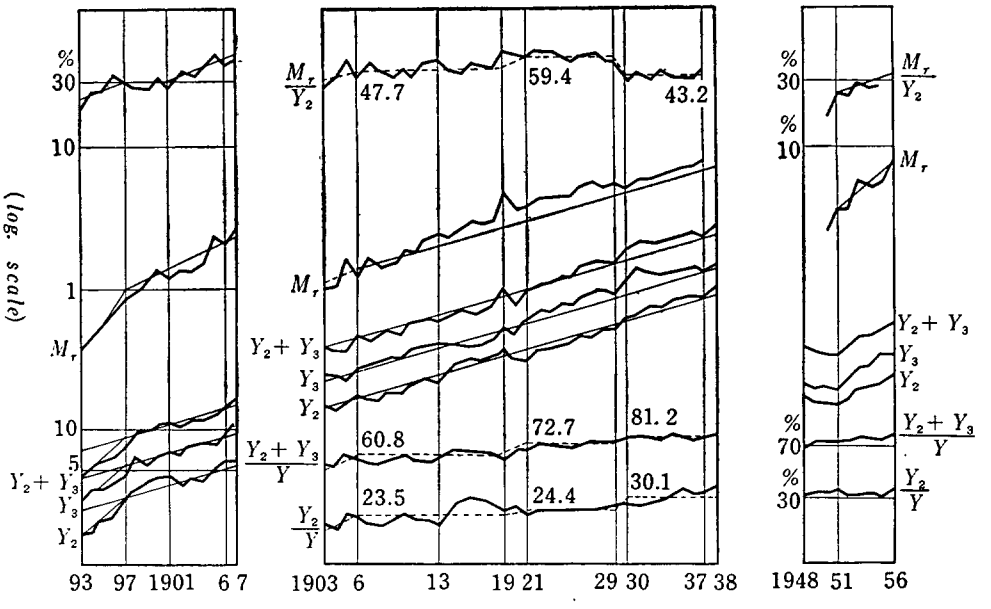


Table 3 $M_r : Y_2$

1)	1906 — 29	$M_r = 0.650\,Y_2 - 123.2$	$R = 0.968$
2)	1906 — 18	$M_r = 0.502\,Y_2 - 21.2$	$R = 0.980$
3)	1921 — 29	$M_r = 0.452\,Y_2 + 230.8$	$R = 0.957$
4)	1930 — 37	$M_r = 0.478\,Y_2 - 160.3$	$R = 0.950$
5)	1931 — 36	$M_r = 0.364\,Y_2 + 188.0$	$R = 0.983$
6)	1951 — 55	$M_r = 0.371\,Y_2 - 186.6$	$R = 0.960$
7)	1951 — 56	$M_r = 0.444\,Y_2 - 562.0$	$R = 0.972$

This suggests that the import demand for raw materials is still heavy and is pushing up the raw material import dependence fairly rapidly. Therefore, we may regard 37.1% as a maximum, and 29.9% as a period average of the raw material import dependence for the next few years. It is expected that, as imports will increase and approach a maximum level, the yearly income elasticity in the 1951–1962 period will be reduced to about 1, and the period income elasticity will become about 1.2, the pre-war level.

The marginal propensity to import raw materials decreased from 65.0% in 1906–1929, the period of intense specialization in developing the textile industry, to 47.8% in 1930–1937, the period of rapid growth in the heavy and chemical industries, and further to 37.1%

Table 4 $\frac{M_r}{Y_2} : \frac{\Delta M_r}{\Delta Y_2}$

(1) Period	(2) $\frac{M_r}{Y_2}$ %	(3) $\frac{\Delta M_r}{\Delta Y_2}$ %	(4) ε	(5) $\frac{Y_2}{Y}$ %	(6) $\frac{M_r}{Y_2}\cdot\frac{Y_2}{Y}$ %	(7) $\frac{\Delta M_r}{\Delta Y_2}\cdot\frac{Y_2}{Y}$ %
1) 1906—29	Min. 40.0				9.6	
(1922)	Max. 63.0	(65.0)	1.220		15.2	(15.7)
	Av. (53.3)			24.1	(12.8)	
2) 1930—37	Min. 40.0	38.5			12.0	11.6
(1937)	Max. 47.0	(47.8)	1.114		14.1	(14.4)
	Av. (42.9)	43.2		30.1	(12.9)	13.0
3) 1951—55	Min. 23.5	22.7			7.4	7.2
(1955)	Max. 27.3	(37.1)	1.416		8.6	(11.7)
	Av. (26.2)	29.9		31.5	(8.3)	9.4
4) 1951—56	Min. 23.5	28.3			7.4	9.0
(1956)	Max. 32.6	(44.4)	1.626		10.3	(14.1)
	Av. (27.3)	36.4		31.7	(8.7)	11.5
1a) 1906—18	Min. 40.0				9.4	
(1913)	Max. 57.8	(50.2)	1.05		13.6	(11.8)
	Av. (47.7)			23.5	(11.2)	
1b) 1921—29	Min. 54.0	(45.2)	0.76		13.2	(11.0)
(1922)	Max. 63.0				15.4	
	Av. (59.4)			24.4	(14.5)	

in 1951—1955. The raw material import dependence shifted downward in similar way. The fall in the raw material import function is an important reason for the widely circulated opinion that a further growth of the heavy and chemical industries will reduce our aggregate import dependence. But this argument should be approached cautiously since it may not be true. The aggregate import dependence depends upon two factors. One is each sector's import dependence and the other is each sector's share in the whole economy. For example, as far as raw material imports are concerned, there is the following relationship: $\frac{M_r}{Y}=\frac{M_r}{Y_2}\cdot\frac{Y_2}{Y}$. $\frac{M_r}{Y_2}$ is expected to decrease as heavy and chemical industries grow, but $\frac{Y_2}{Y}$ will increase, and therefore, it cannot be said that $\frac{M_r}{Y}$ will definitely decrease.

In Table 4, cloumn (5) shows the sector's share, $\frac{Y_2}{Y}$, and columns (6) and (7) show the product, $\frac{M_r}{Y_2}\cdot\frac{Y_2}{Y}$ and $\frac{\Delta M_r}{\Delta Y_2}\cdot\frac{Y_2}{Y}$, respectively. Let us compare the period (2) with (1). $\frac{M_r}{Y_2}$ declined from 53.3% to 42.9%, but $\frac{Y_2}{Y}$ increased sharply from 24.1% to 30.1% and thus has resulted in only a slight increase in the periodic average value of

$\frac{M_r}{Y}$ from 12.8% to 12.9%. In the comparison of period (3) with period (2), $\frac{M_r}{Y_2}$ declined sharply from 42.9% to 26.2%, but $\frac{Y_2}{Y}$ increased a little from 30.1% to 31.5% and thus has resulted in a decline of $\frac{M_r}{Y}$ from 12.9% to 8.3%.

The 8.3% just mentioned is the periodic average value of $\frac{M_r}{Y}$ realised in 1951–1955. How much will it increase for the next few years? Let us suppose that the 1951–1955 raw material import function will continue for the next few years and the raw material import dependence of manufacturing industry, $\frac{M_r}{Y_2}$, will approach its expected maximum, 37.1%. Also we suppose that manufacturing industry's share in the whole economy, $\frac{Y_2}{Y}$, will remain at 31.5%. Thus, we anticipate that 11.7%, a product of 37.1% and 31.5%, will be the maximum level of $\frac{M_r}{Y}$ for 1951–1962.

We had better add few words about the effects of the relative increase in tertiary industry, Y_3. It is interesting to note that tertiary industry expanded for more than other industries during such periods of structural change as 1903–1906, 1919–1921, and 1929–1933, and its expansion both helped and was necessary to the growth of new manufacturing industries. Contrary to a widely circulated opinion, increases in $\frac{Y_3}{Y}$, the relative share of tertiary industry in the whole economy, did not reduce the aggregate import dependence. Tertiary industry's import dependence, say $\frac{M_3}{Y_3}$, is certainly smaller than that of secondary industry, say $\frac{M_2}{Y_2}$, but it may be larger than, or roughly the same as, that of primary industry, $\frac{M_1}{Y_1}$. The increase in $\frac{Y_3}{Y}$ promoted the increases in $\frac{Y_2}{Y}$ by sacrificing $\frac{Y_1}{Y}$. Then, following the formula, $\frac{M}{Y}=\frac{M_1}{Y_1}\cdot\frac{Y_1}{Y}+\frac{M_2}{Y_2}\cdot\frac{Y_2}{Y}+\frac{M_3}{Y_3}\cdot\frac{Y_3}{Y}$, we cannot expect a decrease in $\frac{M}{Y}$. If $\frac{M}{Y}$ should decrease, only a decrease in $\frac{Y_2}{Y}$ would explain it.

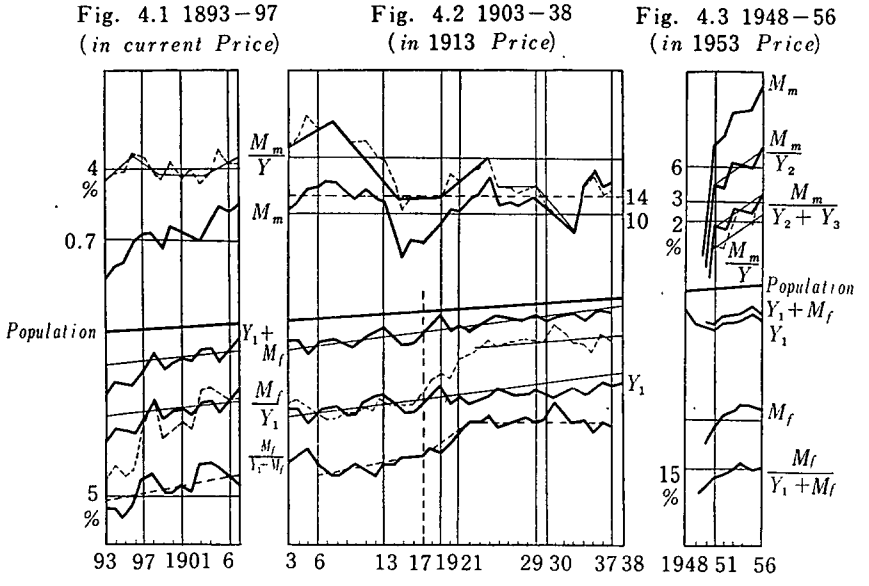
(II–2) *Irregular movements in sectoral import functions*

Indices in Fig. 4 may be useful in finding irregular factors in the historical change of import dependence. It is clear that food imports, M_f, and manufactured goods imports, M_m, moved irregularly.

(II–2·1) *Food import dependence*

Let us call $\frac{M_f}{Y_1+M_f}$ food import dependence with reference to food consumption, where M_f and Y_1 stand for food imports and primary industry production respectively. Although Y_1 includes other production, we shall regard the total of Y_1 and food imports, M_f, as food consumption. In Fig. 4, a straight line is added to Y_1 curve in parallel with the population growth line. It is clear that the increases in domestic food production

Fig. 4 *Irregular Factors*



has been unable to keep up with the population growth since 1920, and, consequently, a rapid increase in food imports, M_f, has been necessary. Supplemented by imported foodstuffs the total consumption of foods, Y_1+M_f, maintained a higher rate of growth than the population increase, allowing for an increasing per-capita food consumption.

Up to 1917, our agricultural production increased to keep up our population growth. As is well known, this was one of the forces which helped promote our successful industrialization.

Movements in the M_f and $\frac{M_f}{Y_1+M_f}$ curves clearly show that a structural change in our agricultural production and food imports took place in 1917–1922. Actually, a large proportion of our staple food, rice, began then to come from Formosa and Korea. It would probably be idle to examine the marginal propensity to import foods, for food imports fluctuate irregularly each year according to whether the domestic harvest is good or bad.

However, we can see a big difference in the period average level of food import dependence as shown in brackets in column (2), Table 5. It increased enormously from 8.1% in 1903–1916 to 20.1% in 1922–1937, the increase was about 2.5 times. This was the first structural change in food import dependence and was due to a big expansion in rice imports from Korea and Formosa. The food consumption share of the national income, $\frac{Y_1+M_f}{Y}$, declined from 43.5% to 28.6%—about one-third. This was the result of the rapid expansion of manufacturing production. A relative decrease in agriculture is a natural and desirable trend in economic growth. As a product of $\frac{M_f}{Y_1+M_f}$ and $\frac{Y_1+M_f}{Y}$, food import dependence with respect to national income, $\frac{M_f}{Y}$, increased from 3.5% to 5.7% (1.63 times) between 1903–1916 and 1922–1937.

Table 5 $M_f : Y_1+M_f$

(1) Period	(2) $\frac{M_f}{Y_1+M_f}$ %	(3) $\frac{Y_1+M_f}{Y}$ %	(4) $\frac{M_f}{Y_1+M_f}\cdot\frac{Y_1+M_f}{Y}$ %
1) 1903 — 16	Min. 6.6		2.9
	Max. 9.9		4.3
	Av. (8.1)	43.5	(3.5)
2) 1922 — 37	Min. 15.7		4.5
	Max. 28.1		8.0
	Av. (20.1)	28.6	(5.7)
3) 1951 — 56	Min. 13.8		3.7
	Max. 16.5		4.4
	Av. (15.0)	26.55	(4.0)

Similarly, we can work out the second structural change in food import dependence between the pre-war period (1922–1937) and the post-war period (1951–1956). $\frac{M_f}{Y_1+M_f}$ declined from 20.1% to 15%—by one-fourth, while $\frac{Y_1+M_f}{Y}$ decreased slightly from 28.6% to 26.55%. As a result, $\frac{M_f}{Y}$ declined from 5.7% to 4%—a change of about 30%. This played an important role in lowering our post-war aggregate import dependence as compared with the pre-war level. The main cause was the structural drop in $\frac{M_f}{Y_1+M_f}$. Since the war, our agricultural production has rapidly been rationalized and our diet, which was strongly dominated by rice, has been changed. Difficulties in obtaining rice from Formosa and Korea are another reason for this change. Taking these changes into consideration, we may forecast that our food import dependence with respect to national income, $\frac{M_f}{Y}$, will average about 4% for the coming few years, although there will be annual fluctuations.

We must bear in mind that the growth of agricultural production as a counterpart of the rapid increase in manufacturing industry has been, and will be, an important determining factor of structural changes in the aggregate import dependence.

(II–2.2) *Manufactured goods import dependence*

Let us call $\frac{M_m}{Y_2}$ the manufactued goods import dependence with respect to secondary industry, where M_m and Y_2 stand for manufactured goods imports and secondary industry output. Through 1893 to 1937, $\frac{M_m}{Y_2}$ showed long-run cyclical movements, as shown in Fig. 5, which involved recurrent drops, levelling off, and upswings. It should be noted that the rapid upswing in the manufactured goods import dependence corresponds to structural changes in our economy. In 1903–1908, the modern textile industry was established and the modernization of domestic industry took effect. In 1919–1924, the mechanization and rationalization of the textile industry took place, and in 1933–1935,

heavy and chemical industry grew. Since a large proportion of manufactured goods imports consisted of investment goods such as machines, equipment and tools, they unquestionably promoted our industrialization and modernization.

Without an increase in investment goods imports, our structural changes could not have been attained. This may be called an "import first" structural change. "Import first" was necessary, for we had not an adequate investment goods industry up to 1930. Fortunately, the necessary exchange to pay for increased imports in the first two structural changes, 1903–1908 and 1919–1924, was provided by foreign investment and gold accumulated during the first World War. Thus, it must be remembered that an abrupt increase in imports of manufactured goods raised the aggregate import dependence during structural changes.

Fig. 5 $\frac{M_m}{Y_2}$ *in Prewar Periods*

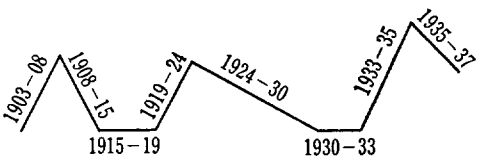


Table 6 $\frac{M_m}{Y_2}$ *in Postwar Years*

	$\frac{M_m}{Y_2}$ %	$\frac{\Delta M_m}{\Delta Y_2}$	ε	$\frac{Y_2}{Y}$ %	$\frac{M_m}{Y_2}\cdot\frac{Y_2}{Y}$ %	$\frac{\Delta M_m}{\Delta Y_2}\cdot\frac{Y_2}{Y}$ %
1) 1951—55	Min. 4.0				1.3	
(1953)	Max. 6.4	(10.3)	1.93		2.0	(3.2)
	Av. (5.3)			31.5	(1.7)	
2) 1951—56	Min. 4.0				1.3	
(1956)	Max. 8.4	(13.9)	2.36		2.7	(4.4)
	Av. (5.9)			31.7	(1.9)	

1951—55 $M_m=0.1031Y_2-84.88$ $R=0.851$
1951—56 $M_m=0.139Y_2-143.98$ $R=0.97$

In post-war years, as shown in Table 6, manufactured goods imports are increasing in keeping a high correlation with Y_2. Manufactured goods imports have come to be as regular a factor as raw material imports are. There are still some doubts as to whether the tendency will continue. But, we can expect that, because we have established an investment goods industry since the 1930's, a relatively small amount of manufactured goods imports will be necessary to supplement our secondary industry and will play the same role as raw material imports. We believe, therefore, that manufactured goods imports will continue regularly at least for the coming few years. It seems that, for forecasting, the manufactured goods import function for 1951–1955 is better than that for 1951–1956. Basing our estimate on the former function, we expect that the import dependence of manufactured goods for the whole economy will increase gradually, approaching 3.2%.

Conclusions

Our investigation of the historical development of Japan's import dependence may be summarized according to Table 7. The main driving force behind our rapid economic

growth has been rapid industrialization, which resulted, in turn, in the relative decline of the agricultural sector. These are the trend factors which determined our import dependence. But, specialization in the textile industry and its mechanization raised our import dependence, while the growth of heavy and chemical industries since the 1930's tended to lower it. In addition, long-term changes in agricultural production also has an effect, giving rise to structural changes in our import dependence.

Table 7 *Factors determined Changes in Import Dependence*

(a) (1) $\frac{\Delta M_r}{\Delta Y_2}$ ..... declined due to shifts in industrial proportion from textile to heavy and chemical industries

(a) (2) $\frac{Y_2}{Y}$ ..... increased gradually

(a) (3) $\frac{\Delta M_r}{\Delta Y_2} \cdot \frac{Y_2}{Y}$ ..... declined moderately

(b) (4) $\frac{M_f}{Y_1+M_f}$ ..... increased sharply due to rice imports from Formosa and Korea since 1917~21, and since the war, declined to 3/4 of 1922~37 level

(b) (5) $\frac{Y_1+M_f}{Y}$ ..... declined rapidly

(b) (6) $\frac{M_f}{Y} = \frac{M_f}{Y_1+M_f} \cdot \frac{Y_1+M_f}{Y}$ ..... 1903~16=3.5%, 1922~37=5.7%, 1951~56=4.0%

(c)—(7) $\frac{M_m}{Y}$ ..... increased rapidly in structural change periods

∴ (2) and (5) are trend factors; (1), (4) and (7) are structural change factors of import dependence.

Table 8 *A Forecast of Normal Import Dependence for* 1951~62

		Minimum	Maximum	Period Average
(a)	Based on the aggregate analysis			
	$\frac{M}{Y}$	12.8 (%)	18.5 (%)	less than 16.0 (%)
(b)	Bassed on the sector analysis			
	(1) $\frac{M_r}{Y}$	7.2	11.0~12.0	9.1~9.6
	(2) $\frac{M_f}{Y}$	4.0	4.0	4.0
	(3) $\frac{M_m}{Y}$	1.3	3.2	2.25
	(Total) $\frac{M}{Y}$	12.5	18.2~19.2	15.35~15.85

Relying upon the historical law thus found, we made a forecast of Japan's import dependence for the 1951–1962 period. A summary of our forecast is given in Table 8, in which the conclusion drawn from the aggregate analysis is compared with that of the sectoral analysis.

Further studies into the relationship between imports and exports, the impact of

the development of the world economy, and so forth, must be considered in addition to this paper. I wish to add that the conclusion of this paper should not be altered significantly by the introduction of these remaining factors. It is hoped, however, we have made clear some aspects of the role played by imports in economic growth and of the historical law of import dependence.

STATISTICAL APPENDIX

Table 1 *National Income, Exports, Imports, and Export and Import Dependence* (Prewar Period)

Years	(1)* Export Value in Current Price (mil. yen)	(2) P_x Export Price Index (1913=100)	(3)* X Export Value in Real Term $\frac{(1)}{(2)}\times 100$ (mil. yen in 1913 price)	(4) National Income in Current Price (mil. yen)	(5) P_y General Price Index (1913=100)	(6) Y National Income in Real Term $\frac{(4)}{(5)}\times 100$ (mil. yen in 1913 price)	(7)* Export Dependence in Current Price $\frac{(1)}{(4)}\times 100$ %	(8)* X/Y Export Dependence in Real Term $\frac{(3)}{(6)}\times 100$ %	(9)* Import Value in Current Price (mil. yen)	(10) P_m Import Price Index (1913=100)	(11)* M Import Value in Real Term $\frac{(9)}{(10)}\times 100$ (mil. yen in 1913 price)	(12)* Import Dependence in Current Price $\frac{(9)}{(4)}\times 100$ %	(13)* M/Y Import Dependence in Real Term $\frac{(11)}{(6)}\times 100$ %
1873	21.6	64.2	33.6						28.1	61.9	45.4		
74	19.3	56.4	34.2						23.5	51.6	45.5		
75	18.6	52.7	35.3						30.0	55.4	54.2		
76	27.7	58.7	47.2						24.0	47.8	50.2		
77	23.3	46.8	49.8						27.4	54.3	50.5		
78	26.0	47.1	55.2	401	49.1	817	6.5	6.8	32.9	48.9	67.3	8.2	8.2
79	28.2	53.6	52.6	611	56.8	1,077	4.6	4.9	33.0	44.1	74.8	5.4	6.9
80	28.4	57.7	49.2	799	67.7	1,180	3.6	4.2	36.6	44.6	82.1	4.6	7.0
81	31.1	56.3	55.2	813	74.8	1,087	3.8	5.1	31.2	43.9	71.1	3.8	6.5
82	37.7	53.1	71.0	713	68.3	1,045	5.3	6.8	29.4	42.1	69.8	4.1	6.7
83	36.3	47.9	75.8	575	53.4	1,077	6.3	7.0	28.4	40.6	70.0	4.9	6.5
84	33.9	50.5	67.1	492	44.5	1,107	6.9	6.1	29.7	41.8	71.1	6.0	6.4
85	37.1	51.8	71.6	621	46.6	1,331	6.0	5.4	29.4	39.6	74.2	4.7	5.6
86	48.9	54.6	89.6	682	42.8	1,592	7.2	5.6	32.2	40.4	79.7	4.7	5.0
87	52.4	56.8	92.3	661	44.0	1,501	7.9	6.1	44.3	41.2	107.5	6.7	7.2
88	65.7	51.5	127.6	675	44.5	1,518	9.7	8.4	65.5	47.6	137.6	9.7	9.1
89	70.1	56.6	123.9	691	48.4	1,428	10.1	8.7	66.1	49.2	134.3	9.6	9.4
90	56.6	59.3	95.4	937	55.5	1,687	6.0	5.7	81.7	47.1	173.5	8.7	10.3
91	79.5	54.8	145.1	837	52.0	1,610	9.5	9.0	62.9	44.6	141.0	7.5	8.8
92	81.1	62.6	145.5	901	53.4	1,689	10.1	8.6	71.3	44.5	160.2	7.9	9.5
93	89.7	68.9	130.2	936	49.5	1,890	9.6	6.9	88.3	50.2	175.9	9.4	9.3
94	113.2	71.0	159.4	1,163	52.3	2,226	9.7	7.2	117.5	61.5	191.1	10.1	8.6
95	136.1	79.0	172.3	1,222	56.1	2,179	11.1	7.9	129.3	60.6	213.4	10.6	9.8
96	117.8	78.9	153.2	1,232	60.6	2,033	9.6	7.5	171.7	61.2	280.6	13.9	13.8
97	166.8	80.9	206.1	1,490	67.0	2,222	11.2	9.3	211.4	66.9	316.0	14.2	14.2
98	170.1	86.8	196.0	2,073	70.6	2,937	8.2	6.7	281.6	65.9	427.3	13.6	14.5
99	222.9	90.9	245.2	1,768	71.0	2,491	12.6	9.8	224.1	67.3	333.0	12.7	13.4
1900	212.8	101.3	210.1	2,024	76.1	2,661	10.5	7.9	291.7	81.4	358.4	14.4	13.5
1901	270.2	90.1	299.9	2,112	72.5	2,913	12.8	10.3	270.6	80.9	334.5	12.8	11.5
02	276.2	90.7	306.5	1,915	73.2	2,617	14.4	11.7	285.8	73.9	386.7	14.9	14.8
03	312.4	94.3	331.3	2,262	77.8	2,906	13.8	11.4	334.6	71.7	466.7	14.8	16.1
04	348.8	95.7	364.5	2,348	81.9	2,866	14.9	12.7	387.6	78.7	492.5	16.5	17.2
05	359.0	99.4	361.2	2,204	87.8	2,510	16.3	14.4	507.8	75.1	676.2	23.0	26.9

1906	462.7	109·4	422.9	2,691	90.6	2,972	17.2	14.2	444.3	76.9	577.8	16.5	19.4
07	461.8	118.4	406.9	3,102	97.7	3,176	15.5	12.8	525.1	81.6	643.4	16.9	20.3
08	423.1	105.2	402.2	3,128	94.0	3,329	13.5	12.1	471.6	79.8	591.0	15.1	17.8
09	459.0	98.2	467.9	3,033	89.7	3,379	15.1	13.8	442.6	74.7	592.5	14.6	17.5
10	492.8	92.2	534.5	2,940	90.8	3,236	16.8	16.5	527.8	84.6	623.9	18.0	19.3
11	515.2	96.5	533.9	3,581	94.3	3,799	14.4	14.1	578.7	89.9	643.7	16.2	16.9
12	611.1	96.1	635.9	4,148	99.9	4,154	14.7	15.3	682.1	94.3	723.3	16.4	17.4
13	715.7	100.0	715.7	4,245	100.0	4,245	16.9	16.9	795.2	100.0	795.2	18.7	18.7
14	670.0	93.1	719.7	3,948	95.3	4,141	17.0	17.4	670.1	99.5	673.5	17.0	16.3
15	790.4	92.4	855.4	3,882	96.6	4,019	20.4	21.3	633.5	91.8	690.1	16.3	17.2
16	1,229.5	117.6	1,045.0	4,716	116.7	4,041	26.1	25.9	880.0	110.4	797.1	18.7	19.7
17	1,743.4	147.6	1,181.0	6,200	146.9	4,220	28.1	28.0	1,206.0	161.0	749.1	19.5	17.8
18	2,150.0	181.0	1,188.0	9,152	192.5	4,755	23.5	25.0	1,911.0	221.1	864.3	20.9	18.2
19	2,374.3	238.9	994.0	13,593	235.7	5,767	17.5	17.2	2,515.2	238.9	1,052.8	18.5	18.3
20	2,203.5	250.1	881.0	11,962	259.1	4,617	18.4	19.1	2,686.4	256.7	1,046.5	22.5	22.7
21	1,502.8	184.1	816.0	11,037	200.3	5,510	13.6	14.8	1,940.4	162.7	1,192.6	17.6	21.6
22	1,879.9	201.5	933.0	11,177	195.6	5,713	16.8	16.3	2,215.5	156.6	1,414.8	19.8	24.8
23	1,686.3	213.8	789.0	11,808	198.4	5,953	14.3	13.3	2,392.9	165.3	1,447.6	20.3	24.3
24	2,105.4	211.1	997.0	12,979	206.3	6,292	16.2	15.8	2,971.2	187.7	1,583.0	22.9	25.2
25	2,670.1	219.1	1,219.0	13,652	201.5	6,775	19.6	18.0	3,105.2	209.9	1,479.4	22.7	21.8
26	2,414.3	189.8	1,272.0	13,195	178.8	7,379	18.3	17.2	2,917.8	175.2	1,665.4	22.1	22.6
27	2,382.9	167.8	1,420.0	13,097	169.8	7,715	18.2	18.4	2,712.0	154.0	1,761.0	20.7	22.8
28	2,400.2	159.9	1,501.0	13,349	170.7	7,819	18.0	19.2	2,744.7	159.2	1,724.1	20.6	22.1
29	2,604.3	156.7	1,662.0	13,297	165.9	8,013	19.6	20.7	2,764.8	153.2	1,804.7	20.8	22.5
30	1,871.2	116.2	1,610.0	11,598	124.8	9,295	16.1	17.3	2,005.4	121.8	1,646.5	17.3	17.7
31	1,479.6	87.9	1,683.0	10,583	105.5	10,034	14.0	16.8	1,686.1	87.7	1,922.6	15.9	19.2
32	1,802.2	91.5	1,969.0	11,835	117.0	10,119	15.2	19.5	1,936.3	102.8	1,883.6	16.4	18.6
33	2,350.7	109.2	2,153.0	13,588	134.1	10,134	17.3	21.2	2,463.8	132.8	1,855.3	18.1	18.3
34	2,789.0	107.7	2,590.0	14,161	136.8	10,352	19.7	25.0	2,970.0	148.2	2,004.0	21.0	19.4
35	3,276.0	109.4	2,995.0	15,600	140.2	11,125	21.0	26.9	3,272.0	153.3	2,134.4	21.0	19.2
36	3,585.0	107.9	3,323.0	17,229	146.1	11,793	20.8	28.2	3,641.0	156.0	2,234.0	21.1	18.9
37	4,188.0	122.2	3,427.0	20,228	177.4	11,401	20.7	30.1	4,765.0	200.9	2,371.8	23.6	20.8
38	3,939.0	125.0	3,151.0	24,016	187.1	12,833	16.4	24.6	3,794.0	193.7	1,958.7	15.8	15.3
39	5,163.0				212.4				4,165.0				
40	5,418.0				249.4				4,653.0				
41	4,384.0				269.1				4,068.0				
42	3,506.0				344.6				2,924.0				

* Exports and imports include those of transactions with Formosa and Korea.

Sources:

Figures of columns (1) and (9): Hisao Kanamori, *Japanese Economy and Import Dependence* (The Research Series of the Research Section, E.P.A., 1957 No. 9), Statistical Appendix, Table 1.

Figures of columns (2) and (10): Y. Yamada and K. Kojima, *International Comparison of Income and Trade, 1949*, Statistical Appendix, Table 2.

Figures of column (4): Kazushi Okawa *et al.*, *The Growth Rate of the Japanese Economy since 1878*, 1957, p. 247.

Figures of column (5): Kazushi Okawa, *ibid.*, p. 130.

Table 2 *National Income, Exports, Imports, and Export and Import Dependence* (Postwar Period)

Years	(1) Export Value in Current Price (mil. yen)	(2) P_x Unit Value of Export (1953 =100)	(3) X Export Value in Real Term $\frac{(1)}{(2)}\times 100$ (bil. yen in 1953 price)	(4) National Income in Current Price (bil. yen)	(5) Combined Wholesale Price Index (4 June, 1950 =100)	(5′) P_g Combined Wholesale Price Index (1953 =100)	(6) Y National Income in Real Term $\frac{(4)}{(5')}\times 100$ (bil. yen in 1953 price)	(7) Export Dependence in Current Price $\frac{(1)}{(4)}\times 100$ %	(8) X/Y Export Dependence in Real Term $\frac{(3)}{(6)}\times 100$ %	(9) Import Value in Current Price (mil. yen)	(10) P_m Unit Value of Import (1953 =100)	(11) M Import Value in Real Term $\frac{(9)}{(10)}\times 100$ (bil. yen in 1953 price)	(12) Import Dependence in Current Price $\frac{(9)}{(4)}\times 100$ %	(13) M/Y Import Dependence in Real Term $\frac{(11)}{(6)}\times 100$ %
1946	2,060.4			360.9				0.6		4,068.7			1.1	
47	10,148.0			968.0				1.1		20,264.8			2.1	
48	52,022.1	97.0	53.6	1,761.8	56.7	36.6	5,359.5	2.7	1.0	60,287.1	115.0	52.4	3.1	0.9
49	169,841.0	92.4	183.8	2,737.3	92.5	59.7	4,585.1	6.2	4.0	284,455.3	98.2	289.7	10.4	6.3
50	298,021.1	82.4	361.7	3,361.0	116.7	75.3	4,463.5	8.9	8.1	348,195.6	89.9	387.3	10.4	8.7
51	488,776.8	122.0	400.7	4,347.5	156.0	100.7	4,317.3	11.2	9.3	737241.3	123.9	595.0	17.0	13.8
52	458,243.2	108.1	423.9	4,959.0	153.6	99.2	4,999.0	9.2	8.5	730,351.7	114.4	638.5	14.7	12.8
53	458,943.4	100.0	458.9	5,647.0	154.9	100.0	5,647.0	8.1	8.1	867,469.4	100.0	867.5	15.4	15.4
54	586,525.0	95.9	611.6	5,984.0	153.1	98.8	6,057.1	9.8	10.1	863,785.4	96.1	898.9	14.4	14.8
55	723,816.0	90.6	798.9	6,548.0	151.4	97.7	6,702.1	11.1	11.9	889,715.0	94.2	944.5	13.6	14.1
56	900,229.0	94.4	953.9	7,427.2	164.1	105.9	7,013.4	12.1	13.6	1,162,704.4	96.9	1,199.9	15.7	17.1

Sources;

Columns (2) and (10): Ministry of Finance, *Monthly Bulletin of Budgetary and Financial Statistics*, No. 74, pp. 23 and 25; in 1948 and 1949, modified E.P.A. Index is used.

Column (5): E.P.A., *Monthly Economic Report.*; in 1948 and 1949, modified Bank of Japan Wholesale Price Index is used.

Table 3 *Indices for Sector Analysis* (1)—*Disaggregated National Income*

	(1) Y National Income in Real Term	(2) Y_1 Primary Industry	(3) Y_2 Secondary Industry	(4) Y_3 Tertiary Industry	(5) Y_2+Y_3 Non-Agricultural Industry	(6) $\frac{Y_2}{Y}$	(7) $\frac{Y_2+Y_3}{Y}$
	mil. yen in 1913 price					%	
1903	2,906	1,396	551	958	1,509	19.0	51.9
04	2,866	1,398	525	942	1,467	18.3	51.2
05	2,510	1,031	580	898	1,478	23.1	58.9
06	2,972	1,281	653	1,038	1,741	22.0	58.6
07	3,176	1,439	626	1,119	1,745	19.7	54.9
08	3,329	1,499	633	1,197	1,830	19.0	55.0
09	3,379	1,388	719	1,273	1,992	21.3	59.0
10	3,236	1,247	733	1,256	1,989	22.7	61.5
11	3,799	1,561	823	1,415	2,238	21.7	58.9
12	4,154	1,760	883	1,510	2,393	21.3	57.6
13	4,245	1,824	854	1,567	2,421	20.1	57.0
14	4,141	1,555	990	1,596	2,586	23.9	62.4
15	4,019	1,287	1,146	1,586	2,732	28.5	68.0
16	4,041	1,294	1,205	1,542	2,747	29.8	68.0
17	4,220	1,443	1,210	1,567	2,777	28.7	65.8
18	4,755	1,708	1,303	1,744	3,047	27.4	64.1
19	5,767	2,201	1,477	2,089	3,566	25.6	61.8
20	4,617	1,570	1,232	1,815	3,047	26.7	66.0
21	5,510	1,754	1,266	2,490	3,756	23.0	68.2
22	5,713	1,572	1,396	2,745	4,141	24.4	72.5
23	5,953	1,683	1,441	2,830	4,271	24.2	71.7
24	6,292	1,782	1,513	2,996	4,509	24.0	71.7
25	6,775	2,031	1,620	3,124	4,744	23.9	70.0
26	7,379	1,951	1,796	3,632	5,428	24.3	73.6
27	7,715	1,879	1,864	3,973	5,837	24.2	75.7
28	7,819	1,885	1,976	3,958	5,934	25.3	75.9
29	8,013	2,003	2,128	3,882	6,010	26.6	75.0
30	9,295	1,811	2,595	4,889	7,484	27.9	80.5
31	10,034	1,734	2,716	5,584	8,300	27.1	82.7
32	10,119	1,896	2,914	5,309	8,223	28.8	81.3
33	10,134	2,042	2,964	5,128	8,092	29.2	79.9
34	10,352	1,846	3,253	5,253	8,506	31.4	82.2
35	11,125	2,099	3,589	5,437	9,026	32.3	81.1
36	11,793	2,302	3,725	5,766	9,491	31.6	80.5
37	11,401	2,171	3,695	5,535	9,230	32.4	81.0
38	12,833	2,216	4,504	6,113	10,617	35.1	82.7
	bil. yen in 1953 price					%	
1948	5,361	1,707	1,651	2,003	3,654	30.8	68.2
49	4,585	1,258	1,473	1,854	3,327	32.1	72.6
50	4,466	1,168	1,439	1,859	3,298	32.2	73.8
51	4,319	1,088	1,406	1,825	3,231	32.6	74.8
52	5,007	1,243	1,569	2,195	3,764	31.3	75.2
53	5,664	1,253	1,800	2,611	4,411	31.8	77.9
54	6,082	1,332	1,913	2,837	4,750	31.5	78.1
55	6,733	1,501	2,050	3,182	5,232	30.4	77.7
56	7,032	1,346	2,298	3,388	5,686	32.7	80.9

Sources;

Columns (1), (2), (3) and (4): Prewar Period—Kazushi Okawa *et. al.*, *The Growth Rate of the Japanese Economy since 1878*, Kinokuniya, 1953, p. 247, Table 3. (deflated by the general price index, 1913=100.)

Postwar Period—Current national income estimated by E.P.A. (deflated by the combined wholesale price index, 1953=100.)

Table 4 *Indices for Sector Analysis* (2)—*Disaggregated Imports*

Years	(1) M_r Imports of Raw Materials and Manufactured Materials	(2) M_f Imports of Foods	(3) M_m Imports of Finished Goods	(4) Y_1+M_f
	mil. yen in 1913 price			
1903	206.6	139.7	103.8	1,536
04	214.9	154.0	122.2	1,552
05	334.8	136.6	165.6	1,168
06	260.5	117.7	160.6	1,399
07	328.6	107.7	187.1	1,546
08	286.0	106.9	182.8	1,606
09	308.1	117.1	151.4	1,505
10	354.3	116.5	130.7	1,364
11	357.0	131.9	161.2	1,693
12	462.0	124.3	134.2	1,884
13	494.2	172.5	124.0	1,997
14	447.1	145.9	79.2	1,701
15	521.9	139.1	43.4	1,426
16	614.2	142.5	57.7	1,437
17	593.6	165.4	54.4	1,608
18	614.4	226.1	65.9	1,934
19	965.6	267.1	77.8	2,468
20	734.3	227.8	103.7	1,798
21	760.5	340.7	103.6	2,095
22	880.2	370.7	129.2	1,943
23	902.4	413.7	142.4	2,097
24	921.1	493.4	186.2	2,275
25	927.5	438.9	116.1	2,470
26	1,073.7	456.1	122.7	2,407
27	1,148.2	493.8	116.2	2,373
28	1,094.0	510.9	128.3	2,396
29	1,155.3	487.5	137.9	2,491
30	1,036.7	463.0	114.7	2,274
31	1,193.5	678.7	97.1	2,413
32	1,198.4	576.4	80.2	2,472
33	1,297.3	471.9	67.1	2,514
34	1,375.6	450.5	178.7	2,297
35	1,497.9	389.5	235.8	2,489
36	1,543.3	541.3	169.8	2,843
37	1,736.2	483.1	189.3	2,654
38				
	bil. yen in 1953 price			
1948				
49				
50	230.0	126.0	11.0	1,294
51	339.0	174.0	59.0	1,262
52	368.0	208.0	63.0	1,451
53	527.0	225.0	115.0	1,478
54	515.0	263.0	119.0	1,595
55	559.0	262.0	121.0	1,763
56	749.0	242.0	193.0	1,588

Sources;

Columns (1), (2) and (3): Include the imports from Formosa and Korea. Deflators are Nihon Bōeki Seiran Index (for the period up to 1930), and Kōbe Shōka Daigaku (the Jyūyō Keizai Tōkei) Index (for 1930~37).

For the postwar period, Ministry of Finance Index by commodity groups.

Table 5 *Indices for Sector Analysis* (3)—*Disaggregated Import Dependence*

Years	(1) $\frac{Y_1+M_f}{Y}$	(2) $\frac{M_f}{Y_1+M_f}$	(3) $\frac{M_r}{Y_2}$	(4) $\frac{M_r}{Y_2+Y_3}$	(5) $\frac{M_m}{Y}$	(6) $\frac{X}{Y_2}$
	%					
1903	52.9	9.1	37.5	13.7	3.62	60.1
04	54.2	9.9	40.9	14.6	4.33	69.5
05	46.5	11.7	57.7	22.6	6.71	62.2
06	47.1	8.4	40.0	15.0	5.49	64.8
07	48.7	6.9	52.6	18.9	5.99	65.0
08	48.2	6.7	45.2	15.6	5.58	63.5
09	44.5	7.8	42.8	15.5	4.56	65.1
10	41.0	8.5	48.3	17.8	4.11	73.0
11	44.6	7.8	43.4	16.0	4.32	64.9
12	45.4	6.6	52.3	19.3	3.29	72.0
13	47.0	8.6	57.8	20.4	2.97	83.8
14	41.1	8.5	45.2	17.3	1.90	72.7
15	35.5	9.8	45.5	19.1	1.10	74.6
16	35.6	9.9	51.0	22.4	1.45	86.7
17	38.1	10.3	49.1	21.4	1.31	97.6
18	40.7	11.7	47.1	20.2	1.41	91.2
19	42.8	10.8	65.4	27.1	1.38	67.3
20	38.9	12.7	59.6	24.1	2.27	71.5
21	38.0	16.3	60.1	20.3	1.91	64.5
22	34.0	19.1	63.0	21.3	2.31	66.8
23	35.2	19.7	62.6	21.1	2.42	54.8
24	36.2	21.7	60.9	20.4	3.02	65.9
25	36.5	17.8	57.3	19.6	1.79	75.2
26	32.6	18.9	59.8	19.8	1.71	70.3
27	30.8	20.8	61.6	19.7	1.57	76.2
28	30.6	21.3	55.4	18.4	1.68	76.0
29	31.1	19.6	54.3	19.2	1.76	78.1
30	24.5	20.4	40.0	13.9	1.27	62.0
31	24.1	28.1	44.0	14.4	0.99	61.0
32	24.4	23.3	41.1	14.6	0.82	67.6
33	24.8	18.8	43.8	16.0	0.69	72.6
34	22.2	19.8	42.3	16.2	1.73	79.6
35	22.4	15.7	41.7	16.6	2.12	83.4
36	24.1	19.0	41.4	16.3	1.44	89.2
37	23.3	18.2	47.0	16.4	1.66	92.7
38						70.0
1948						3.3
49						12.5
50	29.0	9.7	16.0	7.0	0.25	25.2
51	29.2	13.8	24.1	10.5	1.37	28.5
52	29.0	14.3	23.5	9.8	1.26	27.0
53	26.1	15.2	29.3	11.9	2.03	25.5
54	26.2	16.5	26.9	10.8	1.96	32.0
55	26.2	14.9	27.3	10.7	1.80	39.0
56	22.6	15.2	32.6	13.2	2.74	41.5