PROJECTIONS AND POLICIES FOR THE PLANO TRIENAL

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1.   The Plano Trienal ought to be conceived as a transitional plan, with an emphasis on the one hand on monetary and fiscal policies designed to eliminate interim short-term constraints which prevent a higher rate of growth, and on the other, a set of allocation policies to positively assist in attainment of the target rate of growth.

2.   The first task is to define this long-term equilibrium target rate of growth. This requires some type of aggregative production function which expresses the rate of change of output as a function of rates of change of inputs (of all kinds), along with a qualitative judgment concerning the capacity of the economy to invest. For it is clear that higher targets can be attained in the longer term only with higher levels of capital accumulation, whatever the shorter-term possibilities.

The Plano Decenal used for these purposes a Cobb-Douglas production function with neutral technological change, whose parameters yielded the unfortunate implication either of a continually growing investment ratio or an equilibrium rate of growth of per capita product of only 1.9 per cent per year - smaller than the average development of the post-war period. About this result, I wish to make only the following observations. In the first instance, and possibly most important, the data themselves reject the formulation That is, the function used in the Plano Decenal assumed both the form of the function and its elasticities with the single exception of the neutral technological progress trend which was fit to the data. An attempt to fit the form and derive the elasticities and time trend simultaneously rejects the hypothesis. In the second place, the assumptions of neutral change is a priori unacceptable because it makes no effort to explain its source. The low equilibrium rate of growth implied by the relationshipresults from valuing the substantial rise in the capital/labor ratio by the assumed numerical elasticities and a unitary elasticity of substitution. If technological progress is embodied in capital, the extent of its contribution to output is greater, and hence the smaller the required change of the capital-labor

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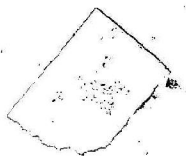
ratio in the future to achieve a given rate of growth. If the elasticity of substitution is smaller, evidently a greater amount of technological change occurred, although this is of probable lesser importance.

To offset these disadvantages, I tried to use the following specification of the production relationship:

$$\frac{\Delta Y}{Y} - \beta \frac{\Delta L}{L} = \alpha + \gamma \frac{I_{-1}}{Y_{-1}}$$

This form, with β specified in advance and equal to the share of labor in income, embodies technological change in the investment component. It first subtracts from the aggregate change in output the portion that can be explained by additions to the labor force, and attributes the residual to capital. It is similar to the Cobb-Douglas, as can be seen by rewriting it in the following form (after dividing by Y, setting marginal product equal to the real wage rate, and excluding the constant).

$$\frac{\Delta Y}{Y} = \frac{WL}{Y} \cdot \frac{\Delta L}{L} = \frac{\gamma K}{Y} \cdot \frac{\Delta K}{K}$$

where γ instead of representing only the marginal product of capital, now includes the effect of technological change.

In its original percentage change form, and even with an inclusion of a dummy to account for the cyclical underutilization in 1955, 1956, 1963 and 1964, the results are poor. Percentage changes in income over the period were reasonably regular, with little variance left to be explained by variations in the investment/income ratio. Or in other words, short term variations in income are not predicted well with this type of formulation. Since our principal interest is with longer-term capital requirements, however, it is permissible to rewrite the relationship in the following form:

$$Y \left[\frac{\Delta Y}{Y} - \beta \frac{\Delta L}{L} \right] = \alpha + \gamma \, I_{-1} \quad , \quad \text{or to}$$

estimate the labor coefficient directly, simply by specification of the equation:

$$\Delta Y = \alpha + \beta \left(\Delta L \, \frac{Y}{L} \right) + \gamma \, I_{-1}$$

Neither form turned out to have any considerable advantage over a simple and direct relationship between the change in income and last period's fixed investment. The first form, with β assumed

to be   .6,   did worse as an explanation of income change than investment alone; the second resulted in an estimate of β of   .18, a value that is both unreasonable as well as being statistically insignificant.

The failure of statistical tests to accept production forms including labor as a variable, whether the Cobb-Douglas function or this modified form, reflects fundamentally the unreliability of the labor series itself. Those data on the economically active population were derived by interpolating Census data on the indices of real product. The interpolation, however, seems to have been done on an inconsistent basis. 1952, with a rate of growth of real product of 5.6 per cent has a 5.2 per cent increase in the labor force; 1949, with the same real product change, only a 2.4 per cent change. 1964, with an increase of real product of 3.1 per cent displays labor absorption of 2.9 per cent while 1960, with a 6.7 per cent change in product, shows an employment increase of 2.3 per cent. Interpolating each sector of employment by its output index is probably responsible for this variation. Yet the resulting variation, in aggregate, in comparison with the real product index describes a pattern of productivity change that is difficult to believe.

Rather than create additional uncertain data, it therefore seems better to recognize the lack of any reasonable basis on which to introduce year to year changes in the labor force to explain output changes. The function used therefore depends solely upon fixed investment in the last period. Labor enters implicitly, in the sense that with the experienced trend growth of labor over the period 1948-1964, the actual investment was sufficient to produce the realized output changes. If the actual production relationship is one of fixed coefficients, a higher rate of investment would be required by higher rates of labor force growth in the future; if the production relationship permits of substitution, more labor requires relatively less capital. For our purposes here, it is sufficient to note that over the period of the projection labor force growth will not differ greatly from previous rates, and admitting the possibility of some substitution, the potential growth target has been set marginally higher.

The function estimated from the data is in fact

$$\Delta Y = 10.67 + .322\ I_{f-1} - 23.0\ D$$
$$(.067) \qquad\qquad (3.6) \qquad R^2 = .78,$$

with both coefficients significant at a 5 per cent level. Note that the equation has been fit using a dummy to absorb the effects of the

less than full utilization in the years 1953, 1956, 1963 and 1964. In this fashion it is possible to convert the realized observations into a "potential" supply function of the kind needed for the analysis. For projection into the future, of course, the dummy is set equal to zero, and the estimates made as indicated by the implied marginal capital--output ratio.

This ratio is equal to $\dfrac{1- \dfrac{10.67}{\Delta Y}}{.322}$ and thus increases

over time, approaching the value 3.11 in the limit. Its value in 1967 is 2.29 (calculated on the basis of the change in potential income in that year). This is in gross terms and of the same order of magnitude as the 2.5 calculated by Baer and Kerstenstsky over the decade 1950-1960. The required gross fixed investment ratio for any given rate of growth is similarly given by the equation

$$\frac{I_{f-1}}{Y_{-1}} = \frac{\dfrac{\Delta Y}{Y_{-1}} - \dfrac{10.67}{Y_{-1}}}{.322}$$

which, for a rate of growth of 6.2 per cent yields a limiting ratio of 19.2 per cent in the long run. In the intermediate run while the term $10.67/Y_{-1}$ still has an effect, the required ratio is smaller, amounting to 16.6 per cent of potential income in 1973. To obtain the total gross investment ratio, an additional allowance for investment in stocks must also be made, of course.

Thus far we have avoided the question of depreciation. As is well known, it is virtually impossible to accurately measure the depreciation of capital through use and absolescence. In the National Accounts the convention of a deduction of 5.0 per cent of income has been adopted. If there is, in fact, a relation between net investment and income change, but a gross capital coefficient is used, the latter will overestimate capital requirements if an attempt is made to accelerate development. The reason is that replacement requirements do not grow proportionately with net investment. The problem is further complicated, however, by the possibility that the rate of growth of output may be influenced by gross investment rather than net (due to the more rapid replacement of older equipment with more modern.) Under the circumstances, since our principal objective is a set of consistent projections for the short term, this matter needs no further analysis here. One may note, however, that the capital requirements over the longer term are possibly an overestimate.

On the basis of this analysis, one can make a persuasive case for a growth target in the range of 6.2 per cent. The trend growth implied by the function itself over the interval 1947-1964 is 6.3 per cent a year, with the actual rate, excluding 1963 and 1964, attaining of 6.1 per cent. The more rapidly growing labor force in the next decade, with some allowance for substitutibility, however small, is also a positive factor. The investment requirements implied by such a rate are entirely feasible and with historical precedent, especially given the possibilities of overestimate noted above. In the future discussion, then, we use the rate of 6.2 per cent as the long term target.

3.   The relevant question, then, is how to accelerate the rate of growth from its current level of about 5 per cent per year to this target level in the shortest possible time. The constraints in this process are of two types, real and financial. The latter are especially relevant due to the simultaneous necessity to restrain the rate of inflation. There are inconsistencies between the objetives of maximizing growth and minimizing inflation a situation which calls for the use of as varied a collection of policy instruments as possible in order to limit such contradictions.

        The two principal real constraints to be considered are the foreign exchange gap and the savings gap, although a third, the physical ability to accelerate investment from its current to its required equilibrium rate is relevant as well. The primary difficulty in such a rapid expansion, however, is the liability of the process in financial terms, and it will be treated in that context.

4.   Two important studies of import behavior in the Brazilian economy since 1953 have been conducted within the last two years by Paul Clark and Samuel Morley. They differ principally in 3 ways. The two principal methodological differences are that Clark uses current dollar measures of imports and a linear functional form. Morley, on the other hand, employs a constant dollar, or quantity, measure of imports and logarithmic equations. The final difference is to be found in different estimates of the effective exchange rate by category, Clark using an unweighted average, with Morley seeking to obtain one that is weighted.

        The present function differs in some respects from the previous work. In the first instance it has been estimated for aggregate imports minus wheat only rather than for individual categories.

One reason for this is the apparent dependence of the various sub-group
upon the same demand variable, investment, and the relative
unreliability of the price elasticity by groups, while it is signifi-
cant in the aggregate. Equally important to bear in mind , however,
is the objective of the import function in this context. It is
designed to provide an estimate of the aggregate import gap, for
a given exchange rate policy. The allocation of this aggregate to
specific categories is part of the sectoral plan itself with the
objective of meeting bottlenecks and deficiences by reliance upon
external supply. To project the imports by category into the future
implies that the same pattern of past development will be replicated
in the future. Although for some purposes this assumption is valid,
it is probably an especially weak one in the context of imports.
Indeed, variation of imports by category is one of the few instruments
of physical planning open to the government.

In the aggregate import relationship, wheat has been set
aside due to its especial dependence upon internal and external policy,
and hence it is better treated as an exogenous, or instrument variable.
In addition I have employed a quantity measure of imports rather than
the current dollar approach favored by Clark, because the latter
results in a downward bias of the estimated price elasticity.(*) On
the other hand, I have chosen Clark's estimate of effective aggregate
exchange rates since they seem to move more reasonably over the period
than Morley's.

The function employed, then, in imports of billions of
constant 1953 Cr$ is

$$M = 1.74 \ I^{1.0305} \ R^{-.3135} \ e^{-.0301 \ t} + M_{TR} + M_{ser} \qquad R^2 = .86$$

$$(.141) \qquad (.200) \qquad (.0080)$$

where M is equal to total imports, I fixed investment, R a relative
price index composed of two elements — the effective exchange rate
divided by an aggregate domestic price index multiplied by the import
price in dollars —, t a proxy for import substitution over time, and
M_{TR} and M_{ser} the addition of imports of wheat and net current account
services to arrive at total imports.

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(*) Higher dollar import prices increase the current dollar value for
a given real quantity of goods, and also simultaneously understate
the true cost of imports, both of which act to depress the calculated
elasticity.

Imports as projected by this relationship may be compared
with some of the alternatives. Using the same estimated investment
total and the same relative price assumptions, Clark's aggregate
function less wheat yields an estimate of $ 2042, in millions of
current dollars for 1970 against our indicated total of $ 2,171 in
constant dollars. Since import prices have declined since 1953,
currently being at about 80 per cent of their 1953 value, our $ 2,171
estimate converted to current prices implies imports of $ 1,737 or
some 20 per cent less. The principal reason for this divergence is the
larger partial elasticity of imports with respect to investment
implied by Clark's function: although only .95 at the mean, the more
rapid growth planned for investment over the next three years causes
it to increase to more than 1.15(*). The logarithmic function by
contrast, has a constant, almost unitary, elasticity.

The implied behavior of imports given by this function
actually used in incremental form, is somewhat at variance with the
World Bank absolute estimates over the same period. Real growth in
imports between 1967 and 1970 in their projections is 18 per cent;
ours is 31 per cent, but with a much larger increase of investment of
53 per cent, and holding relative prices at their 1967 level. The
World Bank estimates, are probably overly pessimistic despite their
apparent low total elasticity with investment, without any allowance
for price or substitution effects, of about 75 per cent. This rate,
which in light of both Clark's research and our own results, seems an
underestimate is actually excessive since it takes no account of the
future non-elastic part of the accounts, principally wheat. With wheat
removed from their projection, the rate of growth of residual imports
is 32 per cent, and the elasticity with investment more than 1.31.

On the other hand it is necessary to add that the function
described above is perhaps a lower bound of requirements. This view
receives additional confirmation from the statistical results obtained
from another regression function, which has considerable theoretical
appeal:

(*) The elasticity is equal to $\dfrac{\frac{\Delta M}{M}}{\frac{\Delta I}{I}}$ or $\dfrac{\Delta M}{\Delta I} \times \dfrac{I}{M}$; the first

term is the coefficient in the regression equation, which is constant,
this second the investment-import ratio which increases relative to
its value in the past due to the planned acceleration in output.

5.   An obvious alternative and/or additional constraint that
must be considered is the supply of domestically generated savings
to finance the investment required by high rates of growth. High
levels of consumption demand accompanied by government determination
to achieve high levels of investment can easily create resort to
inflationary finance.

In the case of the Plano Treinal there is the further
necessity of considering personal consumption for its demand generating
properties. In the Plano Decenal, required consumption as well as
required investment were calculated; for shorter term purposes such
an assumption, particularly in the absence of policy describing its
attainment, is not possible.

Unfortunately, a simple and straightforward consumption
relationship does not appear to characterize the Brazilian economy.
Table 1 below indicates the variations in the ratio of consumption
to gross national product and disposable income (in bill 1953 Cr$) in
recent years(*):

TABLE 1

	GNP	Y_d	c_p	c_p/Y_d	$\Delta c_p/\Delta Y_d$	c_p/GNP	$\Delta c_p/\Delta\text{GNP}$
1953	426.1	357.9	303.1	.847		.711	
1954	460.4	401.5	327.6	.816	.56	.712	.71
1955	492.2	428.7	358.9	.837	1.15	.729	.98
1956	501.2	421.0	350.2	.832	1.13	.699	.91
1957	536.5	445.0	378.9	.851	1.20	.706	.81
1958	571.4	468.6	421.6	.900	1.81	.738	1.22
1959	613.2	504.1	438.3	.869	.47	.715	.40
1960	654.0	523.0	457.2	.874	1.00	.699	.46
1961	703.4	593.0	479.6	.809	.32	.682	.45
1962	740.8	631.1	513.7	.814	.90	.693	.91
1963	754.3	641.9	517.6	.806	.36	.686	.29
1964	777.0	683.0	545.4	.798	.68	.702	1.23
1965	805.2[e]	688.9[e]	597.8[e]	.868	8.88	.742	1.86
1966	840.4[e]	691.2[e]	621.5[e]	.899	10.30	.740	.67

(*) No adjustment for variations in the terms of trade to convert from
National product to national income is made here. It would not alter
matters appreciably and its importance is discussed subsequently.
Disposable income and gross national product are however adjusted to
consumption prices.

fundamental hypothesis concerning behavior, but introduces a
distributed lag into the relationship:

$$C_p = 64.8 + .644 \, Y_d - 68.97 \, P/P_{-1} + .313 \, C_{p-1} \qquad R^2 = .99$$

$$(.156) \qquad (22.17) \qquad (.189)$$

It implies, in the situation in which real consumption grows about
5 per cent a year, a long run marginal propensity to consume out of
current disposable income of .916.

Both of those estimates were derived using statistical
techniques which insure consistency, but remain biased upward in their
absolute level. The reason for this is the inclusion of consumption
within disposable income itself. To eliminate this effect, new
consumption estimates for the Plano Trienal were calculated on the
basis of exogenous elements, rather than disposable income and
substituting estimated imports (from the import equation to be
described subsequently) in place of the actual.

The following results are worth noting. In the first
instance, the forced saving effect which the first two equations
contains is not in fact verified in the post-1953 results. This is
primarily the consequence of the changed technique of estimation -
price is not significant when the function is estimated in a reduced
form for the whole period - but also reflects the alteration in the
time period. Price picks up the declining C/Y_d ratio between the
early post-war period and the 1960's; when the former time period
is eliminated, the variation with price is more irregular. A second
point is the dramatic reduction in the marginal propensity to consume
when the statistical bias is removed. In its simplest form,
$(C_p = f \, (Y_d - C_p)$, where Y_d is adjusted to consumption prices, the result
is $C_p = 248.1 + 2.10 \, (Y_d - C_p) \qquad R^2 = .62$

$$(.47)$$

which implies a marginal propensity to consume of .68. By comparison,
for the same data, $C_p = t \, (Y_d)$ yields the following result:

$$C_p = 50.2 + .748 \, Y_d \qquad R^2 = .97$$

$$(.038)$$

illustrating both the upward bias in the marginal propensity to
consume and the exaggeration of the measured R^2 due to the correlation
of C_p with itself.

In an effort to fit the observed data over the period
1953-1964, and accepting the conventional subtraction of indirect
taxes to arrive at disposable income, two other variables were added:

foreign savings, which was hypothesized to influence domestic consumption positively, and previous peak savings, which were hypothesized to increase current consumption through past accumulation of assets.

The resulting function was:

$$C_p = -57.5 + 2.61 (Y_d - C_p) + 6.09 (M - \frac{P_x}{P_M}X) + 213.4 \frac{S_p}{S} \qquad R^2 = .90$$

$$(.36) \qquad (2.27) \qquad (67.5)$$

Such a relationship, holding all other factors constant, implies a marginal propensity to consume of .72, higher than the simple direct relationship reveals. It also yields a coefficient for the second variable that significantly exceeds the 2.61 which would be anticipated if the only effect of introducing a terms of trade factor were to adjust from a national product to a national income definition. For this reason it is possible to assert that foreign savings increase domestic consumption. Finally, past peak savings are significant in determining current consumption.[*]

Unfortunately, in spite of the quite satisfactory properties of the function during the period 1953-1964, it fails rather badly to predict the great increase in personal consumption during the last two years while disposable income grew but slightly. In absolute terms, the predicted magnitudes for 1965 and 1966 are 476.9 billion 1953 Cr$ and 563.3 against observed totals of 597.8 and 621.5[**] Starting from a 1964 base, the results are a somewhat better 499.9 and 586.5; the prediction for 1966, utilizing the information about consumption in 1965 is 683.4 which overestimates the change. This is to be expected in light of the very large rise in consumption in 1965, and the fact that it therefore does not represent an irreversible change to which the function subsequently applies.

Recalculation of the function to include the divergent 1965 and 1966 observations has the predictable effect of increasing the marginal propensity to consume as well as the influence of past saving behavior, while at the same time diminishing the significance of foreign savings. (Foreign savings were negative in 1965 and small in 1966 without total consumption showing a smaller rate of increase).

(*) $\frac{S_p}{S}$ = 1, when current savings exceed last peak period's.

(**) These are in billions of 1953 Cr$, and difer from the Contas Nacionais of the FGV because of subtraction of $14.0 and $7.0 respectively for inventory accumulation. These estimates have little basis and may be in error.

The predicted marginal propensity to consume increases from the .68 registered in the period 1953-1964 to .75 for the period 1953-1966, and remains highly significant; the importance of past savings levels is larger as well and likewise remains significant.

The implications of this research, with the exception of the behavior of the last two years point to substantial potential domestic savings. Note, moreover, that the sharp increase in consumption registered in 1965 and 1966 was not associated with any rapid output increase as was the case in 1957-58 when a similar growth occurred. Moreover, in light of other information showing virtual stagnation of the consumers' goods industries, an increase of consumption in this magnitude in real terms is difficult to accept.

This analysis also points up the arbitrary and unusual consumption assumptions implicitly made by the World Bank in their projections. Over the period 1968-1970 the marginal propensities to consume which emerge from their data are as follows:

1968	.962
1969	.942
1970	.954

The obvious conclusion which emerges from such levels, and which they draw, is the requirement of high levels of taxes to dampen consumer demand, and the inability of fixed investment to increase by more than 24 per cent over the period, in spite of substantial government savings.

Lower marginal propensities alter both conclusions. They suggest a fundamental weakness in consumer demand, which requires growing investment to sustain rapid increase in total output, as well as continuing Government expenditures on current account. The consequence is a tendency for Government deficits to play a positive role on the demand side rather than a negative one. Also, they reduce required governmental savings to reasonable levels and it is in this sense that one can speak of the absence of a savings constraints.

This analysis of demand obviously directly leads on to the discussion of financial constraints in the next section.

5. The obvious limitation to any substantial increase in aggregate demand to stimulate production is the observed excessive money demand at the present. Of the latter there can be no doubt since the general price index continues to register increases. The paradox of course, is the continuation of inflation in spite of observed excess

capacity in many sectors and the lower real rates of growth in recent years. What resolves this simultaneous inflation without growth in part is the governmental policies of corrective inflation. Since 1964 relative prices of governmental services, rents, petroleum and some agricultural products, particularly meat and wheat, have shown especially rapid increase. In the cost of living index of Guanabara, which considerably underweights rents incidentally, the price index of Habitação has increased 506.8%, that of public services 335.4% and the total only 222.4% from 1964 until October of this year. Such rapid readjustment in areas where supply response was not forthcoming, in the short run meant no immediate stimulus to production while at the same time absorbing disposable income of consumers, and leaving less available for purchases of other products. The higher relative agricultural prices due to the bad harvest of 1966 worsened the situation for industrial demand.

Faced with lower demand, industrial prices reacted by going up. Within an inflationary context, firm policy consists in maximization of cash flow to minimize uncertainty. Faced with fixed expenses, the response of firms subject to weak demand was thus naturally to raise price to enlarge cash receipts, without waiting for any beneficial longer term demand effects from reduced relative prices.

In fact, while the policy of the government ostensibly was gradualism in so far as the money supply was concerned, this gradualism was forced as a response to the distortions in demand created to some degree by the severity of the corrective inflation. An additional element in this redistribution, of course, was governmental policy with respect to wages. Real wages declined considerably, as an attempt was made to reduce pressures from the cost side. The undesired and undesirable consequence was an increase in non-wage income rather than a strong dampening of price pressures.

The government in face of this observed decline in demand for industrial products made available increased credits, but their effect was largely to maintain the status quo rather than alter perspectives. In response to the subsequent increase of liquidity firms preferred a more cautious policy of accumulating working capital rather than immediately increasing output. Then when output increases began to occur governmental policy, frightened by the apparent excessive liquidity in the system began to reduce credits, starting the cycle over again. This stop-go motion accurately describes events from 1965 through the summer of this year, and as elsewhere has created the

undesirable dual consequences of price change without prevision for capacity expansion.

Table 2 as follows indicates the ratios of industrial production to bank loans to the industrial sector to lagged one month. While not conclusive it is suggestive of the above interpretation. The tightening of credit at the beginning of 1965 slowed down production, and required some months of high liquidity until it increased strongly again in late 1965. Again toward the end of 1966, many months of continued pressure against available finance as credit was curtailed led to declines at the end of the year and the first quarter of 1967. What is unusual about the current recovery is the rapidity with which it responded to increased liquidity, which must in part be explained by the expectations in the business community concerning a change in policies by the new government. Also for the first time, real credit has expanded as production has grown.

In retrospect I suspect it would have been better to have let the corrective inflation take the form of altered supply prices to producers, thereby encouraging increased output over time, while regulating price in such a way that the short-term fluctuation in relative prices was damped. Or the alternative was to adopt a fully radical strategy of failing to ratify the price increases. A mixed strategy in some respects reflected the worst of both worlds.

Another factor which has been cited as contributery to the inflation of the last two years has been another relative price change that from negative to positive real rates of interest. Its importance as a direct production cost has been exaggerated, I suspect, given its proportion in that total. But it obviously has played an important psychological role in dampening the optimism of the private sector. Under an inflationary regime, clearly debt was desirable and profitabl to the extent possible. This encouraged high working capital ratios and finance of sales. In particular consumer credit was important to the consumer durables sector where excess capacity had been created. Reversal of such high ratios imposed by more realistic charges, and the inability to secure trade credits, clearly worked to the disadvantage of many firms. What aggravates the problem is the stickiness of money rates despite declining rates of price change, which imposes excessive real rates. These remain high currently probably above 15 per cent as a consequence of lender refusal to believe in the end of inflation during the adjustment phase. Reduction of real rates to reasonable levels of 6-8 per cent is thus a desirable policy move, but one should not move to restoration of unrealistic negative levels.

TABLE 2

INDICES OF INDUSTRIAL PRODUCTION

AND BANK CREDIT TO INDUSTRIAL SECTOR

		INDEX OF INDUSTRIAL PRODUCTION	INDEX OF BANK LOANS	INDEX OF REAL BANK LOANS	$(1) \div (3)_{-1}$
1964	D		100	100	
1965	J	100	99	95	100
	F	98	102	96	103
	M	99	103	93	103
	A	91	109	96	98
	M	90	113	99	94
	J	91	121	106	92
	J	101	128	108	95
	A	107	137	114	99
	S	105	141	116	92
	O	115	146	118	99
	N	116	154	122	98
	D	123	165	179	101
1966	J	102	165	119	79
	F	100	163	115	84
	M	117	160	111	102
	A	109	164	109	98
	M	119	172	111	109
	J	113	177	112	102
	J	116	180	111	104
	A	119	189	114	107
	S	115	195	115	101
	O	116	199	114	101
	N	108	202	115	94
	D	111	210	119	97
1967	J	108	207	113	91
	F	104	205	109	92
	M	118	207	109	108
	A	117	216	112	107
	M	123	227	117	110
	J	128	245	125	109

The principal implications I draw from this analysis is the requirement that monetary policy be geared to a regular, and moderate growth such as to be able to reap the positive advantages of output response to provision of monetary demand. The largest part of the readjustment to the corrective inflation has already occurred and the approach to equilibrium will ultimately occur on the side of supply. The problem of interest rates remains a pressing one, and I will comment upon it subsequently. A second conclusion is the necessity of specific measures directed to remedy deficient demand rather than general monetary increase which can be dissipated in views of the price index. A third requirement is some policy which imposes market restraint and prevents instantaneous transformation of demand pressures into price increases. There is no reason why even with administered prices and consequent cost push pressures rates of inflation should be as great as they have been; in Brazil the monetary authorities are called upon to ratify price increases well beyond cost increases.

The present government has taken cognisance of all these points in framing its policies. Its actions in liberating resources to the private sector, in establishing study groups on the problem of costs and market controls, and a variety of actions applying to specific sectors are consistent with the conclusions drawn above. Where less success has been achieved has been in two areas: preventing a rise in real interest rates and tying its monetary policy to a longer term set of growth objectives. Before passing on to discuss such policy possibilities, it is necessary to consider still another final set of constraints, that of the viability of the required sectoral composition of output.

7. Given a given set of macro-estimates it is possible to generate derivative estimates of sectoral output by the use of at least two different methods. One is the application of regression analysis establishing the relationship between the output of some sector and its corresponding aggregate component: consumption in the case of consumers' goods, investment in the case of capital goods, etc. Such a relationship implicitly assumes that the ratio of intermediate use to total production times the sector's ratio of the final demand component equal a constant. That is, T.P. (total production) = b D where

$$b = \frac{T.P_2}{D_2} \times \frac{D_1}{D}$$

Both components are simultaneous estimated without identification of either.

The alternative approach is to use an aggregated version of the 1959 input - output table. This technique separates out the components

above, holds $\dfrac{T.P.}{D_i}$ constant, but allows variation in $\dfrac{D_i}{D}$ to influence
the sectoral requirements. Its rationale is the assumption of
technological constancy, with freedom to alter sectoral final demands.
Within a market system however, $\dfrac{D_i}{D}$ has to be estimated rather than
imposed; it is typically done on the basis of income elasticities. In the
case of Brazil the problem of estimating $\dfrac{D_i}{D}$ becomes rather more
difficult than usual due to the lack of any commodity flow accounts which
distinguish sectoral final demands.

Both methods have been used to derive the implications of given
rates of aggregate growth upon sectoral demands.

Regression relationships were fit to seven sectors over the
period 1949-1964. These sectors were: 1) Agriculture, vegetable;
2) Agriculture, animal; 3) Consumers' Durable and Capital Goods;
4) Intermediate goods; 5) Consumers' Non-durable goods. 6) Construction;
and 7) Services. For 3) through 7) these represent the following
aggregation from the 32 sector IBGE classification:

Consumers' Durable and Capital goods:
Mecânica, Material Elétrico, Material de Transporte

Intermediate:
Indústria Extrativa, Metalúrgica, Papel, Borracha.

Química
Consumers' Non-Durable goods:
Mobiliário, Couros, Farmacêutica, Perfumaria, Produtos
Plásticos, Têxtil, Vestuário, Alimentos, Bebidas, Fu-
mo.
Editorial, Diversos.

Construction:
Construção, Madeira, Minerais Não-Metálicos.

Serviços:
Energia Elétrica, Comércio, Serviços, Transporte:

In every instance except construction and services the dependent
variable was total supply - domestic production plus imports - as secured
by extrapolating the 1959 sectoral domestic output by the appropriate
production indices and imports by an appropriate constant dollar

approximation[(*)].

The regression equations, with dependent variables all in 1959 Cr$, due to their method of derivation are as follows:

1. Ag. crops[(**)] = $59.9 + 1.660$ PIB Index $R^2 = .99$
              $(.03)$

2. Ag. Animal[(**)] = $33.9 + .5808$ PIB Index $R^2 = .93$
              $(.04)$

3. Capital goods = $-38.184 + 0.6092\ I + 20.32105$ $R^2 = .98$
       I = Fixed capital formation
       to = 1956

4. Intermediate goods: $-14.024 + 1.1\ P_2 + 3.734t$ $R^2 = .99$
       P_2 = Product of secondary sector
       to = 1949

5. Consumer goods = $-76.169 + .57846\ C_p$ $R^2 = .99$
       C_p = Private consumption

6. Construction = $2.056 + .88025\ I$ $R^2 = .95$
       I = Fixed capital formation

7. Services = $102.5 + .435$ PIB $R^2 = .99$

There is an excellent opportunity to compare the actual and predicted values for 1965 and 1966 on the basis of the relationships. Table 3 presents the results:

TABLE 3

(Bill. 1959 Cr$)

	1965 real	1965 predicted	1966 real	1966 predicted
Agriculture vegetable	445.5	435.5	461.8	452.1
Agriculture animal	172.5	165.3	179.0	171.1
Capital and consumer durable	271.6	292.0	337.2	347.8
Intermediate	570.3	563.6	683.9	628.6
Final consumption	777.7	921.3	818.9	960.7
Construction	244.1	214.9	256.4	266.1
Services	1.096.8	1.084.1	1.147.5	1.127.6

(*) - Wheat imports were used for agriculture, vegetable; consumers' non-durable imports, for the same domestic category; intermediate imports, for the intermediate sector; capital goods and consumers' durables for that sector. A complication here is the fact that the classification of imports by category does not correspond to the I-O entries for 1959. I do not believe this to be a serious source of error.

(**)- To eliminate random factors, a three-year moving average was used to eliminate crop variation in agriculture. The PIB Index is equal to 100 in 1949.

In spite of the substantial structural break with the past, the projection technique does not do too badly, with the outstanding exception of consumer non-durables. The estimated values are substantialy above the actual. This is the general direction of bias for the industrial sector, while agriculture and services show the opposite tendency, which of course points up the sources of growth during the last two years.

A second test is the constraint that the sectoral growth rates weighted by their shares in national product be equal to the growth in product. The equations when used for projection do satisfy this condition

Table 4 below gives the percentage rates of growth by sector implied by an aggregate growth rate of 19.7% between 1967 and 1970, with private consumption expanding at 17.6% and fixed investment at 53.3%. To facilitate matters, elasticities are calculated expressing the rate of growth by sector divided by rate of growth of the corresponding macro-economic magnitude. Included in the table as well are the corresponding columns which derive from the input-output approach.

These input-output estimates were derived, in part, by reversing the usual technique. That is we started from observed 1966 total production in an effort to replicate the final demand vectors in that year. On the basis of this estimate, and the apparent sectoral outputs in 1967, we developed a series of final demand elasticities, which were then applied to distribute the growth in the macro-aggregates. These elasticities,[*] for which unfortunately there is no readily available check, play an obviously crucial role in the estimates.

(*) - The values used were as follows:

SECTOR	C_p	C_g	I	X
1	.52	1.00	-	- .60
2	.57	1.00	-	.50
3	1.30	1.00	1.073	1.00
4	1.30	1.00	1.20	1.40
5	1.20	1.00	.95	1.05
6	1.20	1.00	.91	.50
7	.84	1.00	.90	1.17
Wages	1.00	1.00		

TABLE 4
SECTORAL ELASTICITIES AND
RATES OF GROWTH, 1967-70

SECTOR	INPUT-OUTPUT		REGRESSION	
	Growth rates	Elasticities	Growth rates	Elasticities
Ag. Crops	15.1%	.766 (PIB)	16.0%	.812 (PIB)
Ag. Animal	14.5	.736 (PIB)	14.5	.736 (PIB)
Capital Goods	39.9	.749 (I)	44.5	.835 (I)
Intermediate	26.6	.964* (P)	25.3	.917 (P)
Consumer Goods	20.4	1.159 (C)	18.9	1.074 (C)
Construction	31.8	.600 (I)	52.4	.983 (I)
Services	18.4	.934 (PIB)	17.6	.893

(*) - Elasticity calculated multiplying the rate of growth of PIB by 1.4 to
obtain estimate of growth of secondary sector, the demand variable
used for intermediate goods.

These results given their completely independent method of
determination, are encouragingly consistent. Their principal difference
lies in the linkage between investment and its related sources of supply:
the construction and capital goods sectors. As the results stand, it is
the former of the two which exhibits the wider difference. Since the input
output estimates both of construction and capital goods lie below the
corresponding regression estimates, a reallocation of final demand
elasticities can redistribute the difference more equally, but not resolve
it. It is difficult to believe that the share of output coming from the
capital goods and construction sectors is so dependent upon other sources
of demand than investment, that the elasticity with investment can be as
low as that implied by the input-output table. For this reason the
regression results may be more realistic.

No fundamental substantive decision turns on the acceptance of
one or the other set of estimates. The ratio of the annual growth rate
of industrial and construction sectors to that of PIB which comes from
the regression estimates is 1.44; that from the input-output table is a
smaller 1.33. From a trend viewpoint either lies below historical
achievement; the average over the period 1947-1966 is 1.49. But compared
to recent performance both results imply a truly impressive acceleration.
Between 1962 and 1966 the ratio is only 92. Future total development at
more reasonable rates therefore requires restoration of industrial dynamism.

Within industry the area which has displayed the least satisfac
tory behavior has been the traditional consumer's goods activities.

Table 3 indicates the marked shortfall from the regression estimate of the last two years, but such lower rates extend back at least to 1963. This sector is also the one enjoying highest levels effective production, and relatively lower productivity, a fact which is reflected in the high relative prices of its products by international standards. Such a price structure counteracts a presumable income elasticity greater than one and reduces the domestic market, while at the same time completely eliminating potential exports. Extremely rapid aggregate income growth aveided this problem until recent years, and can offset it again in the future to some extent. But it is clear that more fundamental policy measures are called for.

The same is true of the agricultural contribution to growth. Historically the agriculture sector has expanded at a trend rate of less than 5 per cent: over the entire period 1947 to 1966 the rate is 4.4 per cent; excluding the bad harvest in the latter year the rate increases to 4.75 per cent. As such rates, general opinion seems to be that agriculture expanded in proportion to the demand that it faced, and more rapid growth was preeluded by lack of an internal market.[*] This being the case, an augmented role for agriculture which would ease the problem considerably of attaining high rates of growth by reducing the pressure on industry - would seem to depend upon external sources of demand. Experts of a diversified range of agricultural products are not subject to the same arguments of declining terms of trade and variability that dependence upon a single crop implies. Increased agricultural income in turn-without the past implications of unfavorable terms of trade for industry - makes possible wider and more stable markets for consumers' goods.

In sum up them, this analysis of sectoral constraints indicates the past association of high rates of growth with rapid industrialization, in contrast with the recent relative stagnation of the industrial sector. An especial problem is the consumer goods sector. Even with a policy of diversification, in which the agricultural sector grows more rapidly than in the past, direct efforts will be required to confront the problems of industry. Moreover, in view of the observed low income and price elasticities for agricultural products in the

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(*) - See for example, the articles by R.M. Paiva in the Revista Brasileira de Economia, junho/setembro, 1966 and junho, 1967; and A.Delfim Netto e outros, "Agricultura e Desenvolvimento no Brasil", Estudos ANPES no. 5. On the other hand, the 1966 FGV study Projeções de Oferta e Demanda de Produtos Agrícolas para o Brasil, implies more serious potential supply problems.

domestic market, it is unlikely a sustained expansion in agriculture
can occur without vigorous efforts at expert of new crops.

8. As the preceding sections have argued, a high growth policy
with a rising investment ratio is possible but imposes the following
principal requirements:

    a) alleviation of potential foreign exchange shortages

    b) more effective transfer of the potential savings of the
private sector for investment; or in the case of a higher propensity
to consume in the future than the past, efficient transfer of resources
to investment by taxes.

    c) selective stimulation of demand but with continued,
although regular aggregate restraint upon the money supply.

    d) diversification of production to generate more widely
based sources of dynamism within the economy.

    e) stimulation of industrial growth beyond its recent perfor-
mance, particularly the traditional industries.

    f) maintenance of much higher levels of real investment, and
its continuing encrease, over the immediate future.

    The strategy for the Plano Trienal must therefore consist of
a set of policies which can be argued to have at least the desired
qualitative, if not quantitative, effect upon the relevant variables.
Naturally, there will be in addition specific actions related to
individual sectors, but they go beyond the present focus.

    Specifically, I propose the following broad measures, some
of which merely represent an intensification of current policies,
others of which are new.

    1) In the area of monetary policy, both to permit of regular
increases in real liquidity which seem to be a necessary condition for
continuing expansion in recent years, and also to reduce interest
rates, I suggest consideration of a non-corrected interest rate on
current deposit accounts.

I discuss the question of labor absorption in a subsequent section.

The rationale for such a policy is the desire to persuade individuals to hold larger quantities of money in proportion to income by making it a more attractive asset relative to other alternatives. The consequence of such an increased demand is a lower velocity, and therefore for a _given_ level of monetary expenditure, a larger amount of real money balances. Or put another way, it is possible to issue larger quantities of money without a corresponding price effect because some part of the increase is absorbed in idle balances.

Increased real money balances in the economy should in turn support higher levels of real production. From the side of supply, it operates by lowering the money rates of interest charged to firms. The reason for the reduction in money interest rates is the increased real supply of money that is issued to counter existing demand for loans. Fundamentally, in spite of the publicity given to the problem of commercial bank operating costs, the pressure upon interest rates comes from the side of demand. When we observe a reasonably competitive industry with continuing high profits, our natural conclusion is one of determination of price by demand rather than cost of production. But this exactly describes the current banking situation. Moreover, even if banks were to charge explicitly for the services they now provide free, and lower the interest rate to compensate, the _net_ cost of financial intermediation remains unchanged.

Accordingly whatever the virtues of reducing operating costs, these measures do not confront the fundamental factors. If industry and commerce wish the security of credit to reduce uncertainty, this can be made available to them while at the same time attracting others to hold the required offsetting balances. Indeed, the same firms may have larger loans and larger deposit balances simultaneously, and increase production as a consequence of their improved liquidity position.

It is possible to obtain at least a rough idea of the quantitative implications of the imposition of such a nominal interest rate by considering a demand for money function in which the interest rate variable appears, at least implicitly. One such relationship is the following:

$$\frac{M}{P} = 27.4 + .139 \; PNB - 47.2 \; P/P_{-1} + .76 \left(\frac{M}{P}\right)_{-1} \qquad R^2 = .973$$
$$\quad\;\; (.062) \qquad (25.0) \qquad\quad (.26)$$

which, fit to data from 1948 to 1964, represents real demand for money balances as a function of national product, and the rate of change of price, with lagged balances to reflect an adjustment process toward equilibrium. That is, the difference between this period's real balances and last is some fraction of the difference between desired balances and last period's realized balances. Thus we have

$(\frac{M}{P} - (\frac{M}{P})_{-1}) = \lambda (\frac{M^*}{P} - (\frac{M}{P})_{-1})$, where $\frac{M^*}{P}$ is desired real balances and
is a positive function of real income, and negatively related to the
interest rate differential between money and other assets. Such a
differential may be approximated by simply using the rate of change of
prices: with a relatively stable real interest rate, $d(r_e - i_m) = d(\frac{\dot P}{P})$, with the effect of r_e is contained in the constant term, and
the negative rate of interest on money given by the rate of change of
price. With this substitution, $\frac{M}{P} = \lambda [F (Y, P/p)] + (1 - \lambda)(\frac{M}{P})_1$,
which is the form indicated above.

Since by the interpretation, the coefficient on $P/_{p-1}$ represent
the response to the negative rate of interest on money levied by inflation,
the effect of any measure which offsets the erosion of real value of cash
balances, such as an interest rate, can be calculated. Specifically, the
possible first year non-inflationary percentage increase in the money
supply is equal to $\frac{47.2}{229.8} = i. \frac{DD}{M}$, where $i.$ is equal to the commercial
bank interest rate on demand deposits, and $\frac{DD}{M}$ the ratio of such deposits
to the total means of payment (*). In subsequent years one reinforces the
immediate response due to the lagged term included in the equation.
Ultimately, assuming a continued interest rate on accounts, the equilib-
rium absorption of balances is approximately four times the original
effect. Illustratively, for an interest rate on accounts of 5 per cent,
i.e., 3.25 per cent on all means of payment at the current ratio, demand
for real money balances would increase .65 per cent, and after 2 years,
by 1.5 per cent.

This result must understate the potential advantages of such
a policy. This last year, with a decline of 13 percentage points in
the rate of change of price (from a rate of inflation of 38 per cent to
one of about 25) and an increase of real product of 5 per cent, real
money balances have grown by some 10 per cent this year. The partial
elasticity of absorption of money balances with respect to a reduced
inflation tax therefore must have been much closer to unity than the
regression equation suggests. (**)

(*) - It is necessary to include the fraction of the money supply held in
personal demand deposits, since the weighted average interest rate on
all money includes cash for which no return will be received.

(**) - Note that the elasticity of demand for real balances with income is
only .5 in the equation cited, which means an absorption of 2.5 per cent
on that account, and that the effect of lagged balances worked negatively
this last year. Real money balances declined by some 15 per cent between
1965 and 1966.

Other evidence supporting this judgment comes from alternative demand
for money equations with which I have experimented. One form, which
expresses current real demand for money balances as a function of real
product, price change, and this period's nominal money balance devided
by last period's price, an alternative specification of the lagged
reaction, gives an elasticity greater than 3.

Evidently, the greater the elasticity the more effective the policy since it permits larger expansion of the money supply without inflationary impact. But even at levels, say, of .5, the attempt seems worthwhile since it will permit an additional margin of security to a continued expansionary policy. The principal potential objection against such a move seems to the argument that commercial banks could not afford to pay such charges, and hence that they would be passed along as higher interest rates to borrowers. The test here, of course, is the competitive nature of the industry and the excessive profits currently earned. If compulsory reserves are reduced, as a means of expanding the money supply and more earning assets made available per dollar of deposits, this obviously is a favorable counterbalance. Compulsory reserves can also be held in Treasury obligations to yield a compensating revenue. Finally, even if the government had to _issue_ money to pay part of the interest cost, by sudsidizing the banks, the move on balance makes sense. The real liquidity of the economy would be enhanced, and that will reflect itself in lower interest rates, and increased stimuli to consumption and production. By how much, it is difficult to guess, but the direction is clear.

2) In the area of fiscal policy, the principal indication that emerges from the previous analysis is an obvious care to avoid unduly depressing the private sector. Over the recent past marginal net tax collections by the government have risen at an extraordinary rate: between 1964 and 1967 (the last being estimated), the change in tax receipts minus transfers and subsidies has absorbed more than .4 of the change in gross domestic product.

Such an accelerated absorption of resources moreover, has not proceded at a constant rates. Different types of government exemptions from taxes to stimulate business activity have eccurred both in 1965 and 1967, but at least in the first instance, as with working capital, it was a case of added inflationary pressure without supply response. Unrealistic projections of receipts have given rise to exaggerated spending programs and unforeseen deficits which are then offset by rises in tax rates in the future. Such a process plays havec with private sector decision making, and results, as was unintended, in an enlarged government participation in the economy. This is the paradox of the recent past: that a government ideologically committed to free enterprise should have presided over a more rapid increase in its scope than had previously occured.

In principle, it is possible to focus solely upon the deficit as a measure of government imposition upon the economy and to ignore the absolute magnitudes of receipts and expenditures that accompany

it. In an economy where the private sector is expected to play a dynamic role, such a position is less tenable. Wether by virtue of reduced scope for private consumption, or reduced incentives for private investment, taxes take their toll, particularly when they have increased as rapidly as they have done in Brazil.

In light of the demand problem as it now exists the World Bank preference for further increasing the average real tax burden strike me as unfortunate and unsupported. Rather, it is necessary carefully to estimate existing revenue elasticity in the system as it stands to insure that there exists no governmental potential surplus at full capacity to restrain the system. One might even make a case for selected _rate_ reductions at the present if revenue projections confirm the impression that the current levies are quite elastic in their yeld. In recent months, in any event, revenue projections have much more closely approximated original targets than previously.

There is a clear choice implicit here. One may use such a potential surplus to expand governmental expenditures and counteract its inherent deflationary impact. As argued above such a course is unlikely to produce a viable private sector. Alternatively, one may conceive of the government solely as a source of current account savings, directly transferring resources to the private sector for investment. I do not believe that this completely by-passes the problem. To the extent that the government centralizes the command over resources, it is difficult to imagine it without a role in their allocation. But appeal and reliance upon the government rather than the market creates an inherent structural necessity for government to ratify price and allocation decisions, however erroneous they are.

This is not to $_{\wedge}$exempt the government from a crucial developmental role in Brazil. Its direct share of investment is a large and necessary contribution to demand, and supply. But the quality of its own allocation has not been above reproach in the past, and it is difficult to accept the hypothesis that a widened government role in industry will resolve the crisis in that sector, not a small part of which represents past accumulated error. Any reasonable plan for the immediate future, again contrary to the World Bank, given the required increase in total fixed investment to sustain future growth, will necessarily imply a large government share in capital formation. It is unlikely to perform this function well while at the same time seeking to direct private investment.

This discussion thus far has been couched in terms of a "potential" surplus, when in fact there exists a current deficit.

There is no inconsistency between the two.

The latter is an instrument designed to permit sufficient demand for the economy to approach closer to its supply constraints. As one gets closer, the weight of the tax burden may never permit the growth rate to expand rapidly enough, and so cause _actual_ larger deficit with lower cyclical levels of activity. The secret to reducing the actual deficit progressively over time is not increased taxes or reduced expenditure in the present, but growth accompained by flexible government policies that can progressively eliminate fiscal friction as it develops. It is not too early in the current recovery, after the high marginal rates of recent years, to give careful attention to this problem.

For the near term, any further increase in the average tax take ought to be resisted, and the deficit controlled on the side of expenditures, which do not have the same automatic and continuing effect on the economy. The deficit of course is not without limit. Its positive function is to fill an existing real demand gap, but which by reason of imperfect market behavior and mal-distribution of demand is partially translated into price increases. Due to the latter, the constraint upon the size of the deficit is given by the money supply it generates. Because the independent instruments of monetary policy have not functioned very well in the past, the deficit thus has had to play a double role. One of the virtues of the monetary policy suggested above is that it partially negates the inflationary implications of real deficits, and thus permits more flexibility in fiscal policy.

3) Short run wage policy is another element effecting money demand, both through expenditure and costs. Much discussion has been generated concerning the possibility of influencing the former with minimal effect upon the latter, the device being a relative reduction in the social security taxes levied on wages. In this way, if changes in wages are exempt from social security payments, the workers receive an increase of $\frac{\Delta W}{W}$, but the increase in labor costs is a smaller a $\frac{\Delta W}{W}$, where a is equal to the proportion wage receipts are to total employer payments for labor services. Estimates of its value range from .5 as a minimum to about .8 as a maximum. The lower a, the more effective such a policy in augmenting demand without costs.

It is useful, perhaps, to reframe the proposal solely as a fiscal measure in order to isolate its economic effects. The increase in money wages may be viewed as the equivalent of a substantial tax reduction on wage goods whose affect is to increase real demand for them. To finance the deficit thereby initially created, by the

reduction of revenue, the money supply is augmented or velocity must increase through increased sale of government securities and higher interest rates. Under the pressure of increased demand, prices or output rise depending upon the response of producers of wage goods. With increased money income, a larger revenue flow enters the Treasury to offset the original deficit.

With a $> o$ as it is, there is some immediate impact upon prices alone, likewise, from the cost side, independent of demand. The increase of the money supply emanates in the case of a wage increase not from a government deficit, but as a means of permitting firms to pay the higher wages without suffering any depletio. in financial resources. Without a correspondeing money supply increase the requirement to pay higher wages would cause a temporary crisis in liquidity and consequent production stoppages. Furthermore, it is unlikely that the monetary value of social security expenditure will remain constant - implying a decrease in real terms. An augmented deficit is therefore probable in this case as well.

In light of this comparison, it may be that the income redistribution intention of the wage increase may be effected more satisfactorily though the fiscal than the wage mechanism.

An excise tax reduction on wage goods in the first instance reduces prices; a wage increase raises them to the extent a $\frac{\Delta W}{W}$. Since money supply increases are required in any event, there is at least no obvious difference on that score, and government debt to implicitly pay the wage increase, rather than enterprise debt, has less negative implications for private sector investment decisions.[*] Finally, the political controversy surrounding wage policy may take it difficult to operate constructively in that area, whereas fiscal policy is more exempt from that onus. The principal difficulty is a sufficiently large reduction in the prices of wage goods to have an effect.

4) This monetary and fiscal strategy is designed to provide elements of expansion at the aggregate level, by increasing real money balances and by providing a respite from the pressure of growing taxes. It is doubtful whether by themselves they are sufficient to impel the economy toward higher growth rates and accelerated investment. For this reason it is essential to frame a medium term policy designed to supplement market forces of aggregate demand.

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[*] The one principal offsetting advantage of the exemption from social security taxes is that it reduces the wedge between wage receipts and wage costs, and se helps to eliminate some of the bias against employing labor. Section 9 discusses this question.

One corner-stone of such a policy must be reactivation of
private fixed investment. Between 1959 and 1967 there was virtually no
change in its absolute level. There are at least three distinct hypothe-
ses that relate to this lack of growth. The first is political uncertain-
ty, which is borne out to a certain extent by a continuing, although
modest increase of private investment to a peak in 1961; the second is
increasing difficulty with the balance of payments, making imports of
capital goods more difficult and at the same time not facilitating
domestic import substitution because of various sporadic attempts to
control the accelerating domestic inflation; and the third, and most
basic, is the failure of the domestic distribution of income to support
the industrial structure rapidly built up from 1955 on, and hence an
overinvestment in facilities which can only be remedied by time, and
only avoided in the future by structural reforms.

I suspect there were contributory elements from all three
sources. An investment demand equation reveals the importance of
elements 2 and 3. The function fit over the period 1948-1964 was of
the following form:

$$I_{pf} = -7.1 + .27 \ PIB - .115 \ K + .481 \ \frac{Px}{P_M} x \qquad (R^2 = .86)$$

$$(.12) \qquad (.069) \qquad (.261)$$

Realized private fixed investment is here described as the consequence
of a capital stock adjustment process, with the additional factor of
import capacity entering in a positive fashion. Higher rates of growth
of capital than income tend to depress investment - as is predicted by
the hypothesis of too rapid development of the industrial park without
corresponding structural changes - and the failure of import capacity
to grow also depresses investment as is argued by those who place
faith in the balance of payments crisis.

Unfortunately the equation fails to continue to work in 1965
and 1966, predicting levels of investment far higher than those realized.
It is precisely for this reason that it seems impossible to rely upon
larger real income by itself to spark a recovery. Rather special invest-
ment credits ought to be made available to facilitate capital formation.

The form of such credits is crucial for the shape of subse-
quent development. I suggest two features for inclusion in any scheme;
a) the credits ought to be given at the time of actual
installation of the equipment rather than prior to the investment as

is characteristic of Arts 34 / 18;   this in practice means an accelerated
depreciation offset of some type;   b)   the investment ought to be directed
by market forces rather than allocated to reequip a given industry A   or
B   whose claims depend upon political power.   But the way to permit the
market to operate efficiently is not to allow prevailing relative prices
to determine the pace of expansion.   With the distortions introduced by
rapid industrialization of the past, this would   not create a more viable
industrial park.   What strikes me as feasible under such conditions is
to tie investment credits to export of the final product.   Thus a firm
would receive a greater drawback to the extent its product was sold abroad.

What are the advantages of such a scheme?   In the first instance
it allows comparative advantage to operate to select the site of marginal
industrial expansion.   Secondly, it provides an indirect competitive
mechanism to regulate the domestic market.   Firms engaged in the export
market have their price determined by world prices as well as domestic
demand.   To the extent that there is an incentive to maintain a position
in the world market, the firm is constrained in prematurely passing along
costs and contributing to inflationary pressure.   Thirdly, it may, perhaps
with additional measures, provide an opportunity for the traditional
industries to re-equip, lower costs, and enter into a new market to provide
alternative sources of demand.   The reduction in relative price of the
product deriving from productivity increase in turn would mean an enlarged
internal market by virtue of price elasticity effects.

Note that while the emphasis of the policy is upon export
promotion, there is a corresponding import substitution component in the
investment goods sector itself.   Increased demand for machines to supply
sectors with real comparative advantage creates corresponding possibili-
ties for supply.   Efficient domestic production of capital goods depends
ultimately upon efficient production of consumers goods that provide a
predictable, and growing market.   Indeed, in part, the artificial past
separation of the processes of consumer goods and capital goods substitu-
tion has been responsible for lack of demand for the former and excess
capacity for the latter.   Production of consumers' goods, and separation
from the external market, meant low rates of productivity growth and
ultimately - for reasons previously discussed -- relative stagnation.
The capital goods industry arose more independently of the consumers'
goods sector -- which was not a reliable customer -- and depended more
upon production   of consumers' durables and its own rate of expansion.
Articulation between the capital goods and consumers' goods sector in
Brazil thus has never strongthened and reinforced the industrialization
process.

The use of an export device to bring to the consumers' goods industries the effect of market forces avoids the alternative of allowing imports to exercise the same function and thereby endanger domestic production. The effectiveness of an export orientation depends upon the potential but unrealized comparative advantage in many of these industries unrealized because of antiquated technology and disadvantages imposed by a deliberate governmental policy of import substitution of capital goods

The quantitative implications of such a policy direction are difficult to assess. Exports of manufactures at present are less than 10 per cent of total exports, and as a proportion of total industrial production an even smaller 4 per cent At first glance, therefore the effect of an export focus in the manufacturing sector would seem almost futile. But the force of the argument is not that exports bear the burden of the industrial recovery but rather that use of the market mechanism as guided by international prices will permit a more viable industrial structure resting primarily upon internal demand. Just the way the marginal consumer determines the price of the product the marginal market can help to guide the total allocation of resources. Exports of manufactures have grown from $ 50 million in 1962 to what will probably be in excess of $ 125 million this year. This has occurred with an almost constant real exchange rate. The acceleration after 1963 is explained by slower domestic growth and by non-price incentives. But if there has been this ability to respond to a series of limited governmental stimuli, the reaction to a serious and vigorous development program may turn out to be quite surprisingly large. At rates of growth of say 15 per cent a year, while manufactures as a whole was growing at 8 per cent exports would explain 8 per cent of the total growth in industry over a 5 year period of time. This is no longer a small proportion, and would increase as a ratio of the output emanating from new capacity installed.

To assure the success of such an outer-directed focus with simultaneous import substitution would seem to call for a real devaluation[x] The current exchange rate is still about its 1953 level in real terms A devaluation in excess of intervening price rise since the change in February 1967 would give a substantial stimulus to exports as a measure of the government's serious intent to follow through on a consistent strategy of industrial growth. To avoid adverse consequences upon prices of imports, tariffs could be further reduced, but selectively in view of

(x) Another underutilized possibility is ALALC, through which some reciprocal expansion in trade in manufactures may be possible. Since the matter involves not only economic but also political decisions, and is not entirely a matter for individual decision I leave it to one side.

the import substitution possibilities in the investment goods sector.
Such a real devaluation, of course, need not be extended to primary
sectors where price elasticity is limited. Export taxes can be applied
to offset higher revenues to prevent a decline in the terms of trade,
and also to replace import levies lost.

One further facet of a real devaluation is the effect upon non-
-traditional agricultural exports. This is an important element in
creating incentives for modernization in that sector, in developing an
internal market built upon increasing rural real incomes, and supporting
the balance of payments. Various studies which have been undertaken on
such potential exports are invariably optimistic about the possibilities.
The principal products in this category seem to be rice, maize, live-
stock products, and oils and fats. Since Brazil would be at best for
many years a continuing marginal exporter, it faces a considerable
elasticity of world demand. It therefore follows that a reduction in
price ought to yield substantial consequence.

In this section we have elaborated one possible strategy designed
simultaneously to increase demand, diversify production, create incentives
for investment, and allocate resources efficiently, at least for the new
industrial capacity created. Its major defect as a viable program is
the current small role of export in the economy. But in conjunction with
other direct sectoral programs, and as a central principle for the
next phase of the Brazilian industrialization, I believe it has
possibilities. The more so ir present signs of a continuing recovery
are valid.

9.   So far we have concentrated on output changes to the exclusion
of the employment question. The problem of the latter is well known:
the small absorption of labor by the industrial sector, the continuing
rural surplus exiting from agriculture , the growing residual employ-
ment in the service sectors and resultant open or partially disguised
unemployment. No substantial progress on this question can be made
without re-examining current labor policies. At the present time, as
mentioned above, there is a substantial wedge, whose average magnitude
is between 20 and 40 per cent, between wages received and labor
costs to the entrepreneur. The market thus automatically discriminates
against labor and in favor of capital, without fully corresponding real
benefits for employees. It is equally futile to ignore the pressures
imposed by a population growth in excess of 3 per cent, whose effect
is exactly to reduce the real wages capable of being earned.

Over the shorter term, rapid growth is an effective weapon. The total labor force is projected to grow by some 2.5 million between 1967 and 1970. At rapid rates of growth for industry above 8 per cent, and recognizing the necessity for substantial new investment in the consumers' goods industries, absorption there is most unlikely to exceed 400,000, and will attain that level only by consequence of acceptance of very high rates of growth of the construction sector. Within agriculture, again even with accelerated output demand due to exports, the demand for labor is likely to be no more than about 900,000 over this interval. The residual 1,200,000 would have to enter the service sector. This is not an unreasonable supposition. It would represent about a 10 per cent change in the existing service labor force while its product grew almost twice as rapidly. This is well below the historical elasticity observed in this sector, and means that the absorption is real and not merely fictional.

For the short run, this suffices while the labor force is increasing at rates of only 3 per cent, while product is expanding at 6.2 per cent, and with optimistic elasticities assumed. Over the longer term, however, with an acceleration to an anticipated 3.5 per cent per year growth in the labor force, and without more rapid augmentation of total product, the problem is more serious. Besides attacking the problem at one source, the artificially high demand price forced on labor, it is possible and desirable to attack at it another. That is on the supply side. Increased incentives to education mean a gradual reduction of labor force participation throught longer years of schooling and a higher proportion of school attendance. Perhaps current social security funds could be diverted to the use of the children of the present generation who then would be better situated to care for their elders later through general taxes. At the same time that a higher quality labor force is trained for the future, with greater flexibility and mobility, one reduces the pressure in the intermediate term upon available opportunities.

One has a clear choice between maximizing output and maximizing employment. The criterion for the former is paying labor its marginal product; that for the latter, employing all persons in the economy regardless of productivity. There are obvious variations in between. Maximum output affords the possibility of redistribution of income to those without jobs. Employment for all may mean lower standards of

living for most. The late developing countries have entered into the process of industrialization without a functioning labor market to allocate human resources. Historically, how wages permitted absorption of labor at rapid rates, while population itself was growing considerably more slowly. Under present circumstances, this is not easily done. The implications of the present arrangement are a more unequal distribution of income for given levels of product. Present transfer mechanisms have done little to alter this, while at the same time impeding the market further; but it is preferable to consider the problem in terms of such a better mechanism than to try mass labor intensive activities with little prospect of success.

10.   Ideally, linked to any strategy and associated policies, is a unique set of projections of income for the future. No projections are devoid of implicit policies necessary to realize them; no explicit set of policies should fail to influence projections. Without knowing tax policy it is impossible to project disposable income and hence consumption; without a specified monetary policy and other investment incentives it is impossible to assign realistic levels of private investment; without exchange rate policy the likely level of exports. The problem in making projections for the Plano Trienal, like the Plano Decenal, is that these policy relationships are still only minimally quantified. That does not alter the obligation to examine each project and consider its viability. This was the great error of the Plano Decenal where private investment could be programmed to grow more than 20 per cent from 1967 to 1968, 4 per cent in the following year, followed again by an acceleration to 22 per cent and a decline to 6 per cent. Such a cyclical pattern is doubtful of physical attainment, let alone reflecting a response to the private profit motive.

Perhaps the most fundamental option in light of these uncertainties is whether the government will err on the side of restriction or expansion. There is much to be said in favor of the latter at this juncture. The experience of development in the postwar period has been strikingly bi-modal: countries have experienced substantial and sustained growth or very little at all. The reason follows, I believe, from the ability of high rates of growth to generate their own reinforcing qualities. High rates of expansion favor introduction of new technology and expansion of productive firms relative to marginal ones. They imply scarcity value for specific skills which leads to widening wage differentials and incentives for education. Distribution problems diminish in intensity when the total pie is growing rapidly enough to augment the share of all. Gradualism may be an acceptable and viable policy against inflation but less likely to succeed with growth.

The dangers of an expansionary policy, moreover, may be hedged against. Supply of imports to meet temporary shortages which threaten to have far reaching price and supply effects is a realistic policy, if adquately foreseen . The experience of the past years has been disappointing in this respect, foreign reserve acquisition leading to monetary expansion in 1965, and substantial dissipation due to speculation in 1966 and 1967. Improvement governmental flexibility could yield substantial benefits.

Over the longer term, the strategy here advocated has the possibility of guiding future industrialization more rationally and more viably. It offers an alternative model to the simple conceptualization of consumer import substitution followed by capital goods substitution which has proven unsucoessful in Latin America. It focuses upon the simultaneous possibility of export of consumers' goods (and for that matter, other capital goods) while completing the process of import substitution. It emphasizes the strength of a process of industrialization in depth rather than width.

What I mean by the former term is a vertical industrialization in which growing capital goods production is directed to a strong and growing consumer goods output sector, in which an indigenous technology develops initially within a limited compass of industry and then breadens out. Replacemant of goods imports by domestic manufacture of capital goods is not sufficient to complete the process of import substitution. What is equally required is the technological capacity to develop new models of machines over time and to adjust existing models to yield higher productivity. Such a technological import replacement requires a large and specialized growing market. It probably also requires a large degree of indigenous ownership, which is another reason to favor a strategy which, of domestic savings are sufficient, can generate its own foreign exchange requirements.

Finally, the strategy advocated here is one which retains and strengthens the market. This is not to say it relies upon it blindly. Rather beoause of all the well known defects of existing domestic market structures, it goes beyond it to impose more reliable resource allocation indicators. One may abandon the market in favor of direct decision making of one type or another, and as is the case with many of the Communist planned economies may even succeed in growing

rapidly. The reason, however, is less the efficiency of allocation than the direct control over resource supply that accompanies it. Fundamentally, however, the willingness to finance capital formation is a manifestation of popular desire for development, reflecting the importance of the future relative to the present. High valuation of current rather than future income will frustrate any market policy. In Brazil there is no reason to believe that we have yet arrived at that impasse.

APPENDIX A

A set of illustrative macro and sectoral calculations in 1952 Cr$ is here included, and designed to reflect, qualitatively at least, the implications of the policies discussed in the text.

Table A-1

The estimation method used for the macro-estimates for 1968, 1969, and 1970 is the following:

1. Establishment of target rates of growth of gross domestic product.

2. Solution of fixed investment required to sustain equilibrium growth of 6.2 per cent under the two constraints that the investment-income ratio attain its stationary value in 1974, and that the rate of growth of investment follow a pattern of accelaration followed by gradual deceleration The last censtraint is qualitative, but succeeds An locating fixed investment exactly enough. The equilibrium ratio is growth by the equation $ay = 10.67 \quad .322 \; I_{f \; -1}$

3. Solution for incremental net tax collections by application of rates of .21 in 1968, and .20 in 1969 and 1970.

4. Solution for personal consumption by application of a marginal propensity of .82 out of disposable income.

5. Solution for changes in commodity imports from the 1967 base by application of the equation on $M = 1.74 \; I^{1.0305} \; R^{-.3135} \; e^{-.0301t}$. The 1967 relative price of imports was kept constant. Wheat imports and miscellaneous services were maintained at their 1967 level, and extrapolation of payments to the exterior followed the World Bank estimates.

6. Assumption of export growth of 6 per cent per year.

7. Assumption of investment in inventories equal to .01 PIB.

8. Residual solution for government consumption:

$$Cg = PIB - C_p - I_s - X \; M$$

9. Division of fixed investment into government and private components applying the dual criteria that the private share of fixed investment increase slightly over the period and that government investment as proportion of government expenditure increase.

PLANO TRIENAL PROJECTIONS OF MACRO-ECONOMIC VARIABLES

In Bill. 1953 Cr$

	PIB	C_p	C_g	I_p^f	I_g^f	I_s	T	X	M	(M SENT TO EX-TERIOR)
1965	809.9	597.8	110.6	38.4	36.3	14.6	146.8	41.7	29.5	4.7
1966	845.8	621.5	116.6	56.1	36.6	7.0	167.3	47.4	39.3	5.4
1967	890.6	650.0	123.0	64.0	40.1	8.9	167.3	47.4	42.8	5.3
1968	944.0	684.7	126.2	73.2	47.0	9.4	178.6	50.2	46.7	5.5
1969	1 002.5	723.1	128.2	85.4	54.0	10.0	190.3	53.2	51.4	5.7
1970	1 065.7	764.5	130.6	98.6	61.0	10.6	202.9	56.4	56.0	5.9

SOURCE: 1965, 1966   Contas Nacionais (whith exception of taxes which are estimated).

          1967   Estimated.

    1968, 1970   Projected. See text for explanation.

PIB: Produto Interno Bruto.
C_p :   Consumo pessoal.
C_g :   Consumo do Govêrno.
I_p^f: Investimento privado fix
I_g^f: Investimento do Govêrno fixo.
I_s :   Investimento em estoques.

T :   Impostos menos subsídios e transferências.
X :   Exportações.
M :   Importações.

TABLE A-1a

PLANO TRIENAL PROJECTIONS OF MACRO-ECONOMIC VARIABLES

ANNUAL RATES OF GROWTH

	PIB	C_p	C_g	I_{pf}	I_{gf}	I_s	T	X	M	(M SENT TO EX-TERIOR)
1966	4.4	4.0	5.3	46.1	0.8	- 52.1	14.0	13.7	33.2	14.9
1967	5.3	4.6	5.6	14.1	9.6	27.1	0.0	0.0	8.9	- 1.9
1968	6.0	5.3	2.6	14.4	17.2	5.6	6.8	6.0	9.1	3.8
1969	6.2	5.6	1.6	16.7	14.9	6.4	6.6	6.0	10.0	3.6
1970	6.3	5.7	1.9	15.5	13.0	6.0	6.6	6.0	8.9	3.5

SOURCE: Table A-1

PLANO TRIENAL PROJECTIONS OF GOVERNMENT SECTOR

PARTICIPATION IN THE ECONOMY

	$\frac{Cg}{PIB}$	$\frac{Cg + Igf}{PIB}$	$\frac{Cg}{Cg + Igf}$	$\frac{Igf}{Cg + Igf}$	$\frac{Igf}{I}$	$\frac{Igf}{PIB}$	$\frac{T^*}{PIB}$	$Cg + I'gf - T^{*(a)}$	$\frac{Cg + I'gf - T^{*(b)}}{PIB}$
1965	13.7	18.1	75.3	24.7	40.6	4.5	18.1	6.1	0.8
1966	13.8	18.1	76.1	23.9	36.7	4.3	19.8	− 8.1	− 0.9
1967	13.8	18.3	75.4	24.6	35.5	4.5	18.8	2.4	0.3
1968	13.4	18.4	72.9	27.1	36.3	5.0	18.9	2.4	0.3
1969	12.8	18.2	70.4	29.6	36.1	5.4	19.0	0.7	0.1
1970	12.3	18.1	68.2	31.8	35.8	5.7	19.1	− 1.0	− 0.1

SOURCE: Table A-1

(a) I'gf - Equals government fixed investment from Table A-1 multiplied by 1.16565 to convert from the investment deflator to the PIB deflator.

(b)   -   The deficit here is in national account terms. The federal government cash deficit after being adjusted for differences in concept , is about 1.7 percentage points of PIB larger than the federal national accounts deficit. This accounts for the apparently low absolute levels of the percentages in this column. It should therefore be read interms of charges from current levels.

TABLE A-1c

PLANO TRIENAL PROJECTIONS OF SECTORAL SHARES IN

TOTAL OUTPUT

	$\dfrac{Cp}{PIB}$	$\dfrac{Cp + Cg}{PIB}$	$\dfrac{Ipf + Igf + Is}{PIB}$
1965	73.8	87.5	11.0
1966	73.5	87.3	11.8
1967	73.0	86.8	12.7
1968	72.5	85.9	13.7
1969	72.1	84.9	14.9
1970	71.7	84.0	16.0

SOURCE: Table A-1.

PLANO TRIENAL PROJECTIONS OF FOREIGN SECTOR

MILLIONS OF 1966 $ (1966 Terms of Trade)					%
	X	M	M (sent to exterior)	X-M (including M sent to exterior)	X-M (including M sent to exterior) / X
1966	1741	1511	193	37	2.1
1967	1741	1646	189	- 94	- 5.4
1968	1844	1795	197	-148	- 8.0
1969	1954	1976	204	-226	-11.6
1970	2072	2153	211	-292	-14.1

MILLIONS OF 1966 NCr$ (1966 Terms of Trade)					%
	X	M	M (sent to exterior)	X-M (including M sent to exterior)	X-M (including M sent to exterior) / X
1966	4118	3619	552	- 53	- 1.3
1967	4118	3941	542	-365	- 8.9
1968	4362	4301	562	-501	-11.5
1969	4622	4733	583	-694	-15.0
1970	4900	5157	603	-860	-17.5

SOURCE: Projections from Table A-1 converted using exchange rates based on 1966 prices.

Table A-2

In the sectoral estimates, the regression method was used in lieu of the input-output approach. These equations are described in the text in section 7. The principal question is how to project further change - whether to use the initial relationship unaltered, to apply the equation in incremental form to the last observed value, or to apply the percentage change given by the equation to the last observation. It may be easily shown that when the last real value lies below the regression line, as is usually the case here, the methods outlined above yield projections of successively declining magnitude. Each of the methods correspond to a substantive assumption concerning the permanence and form of the last observation from the regression. If random, the equation should be used in its original form; of absolutely permanent, the method of increments; if permanent in a percentage form, the method of percentages.

In short periods the choice is not especially crucial. In fact, we applied absolute increments in the case of both agricultural sectors, services, and for intermediate goods and capital goods. In consumers non-durables and construction, for both of which some policy measures were assumed to sustain recovery, we nonetheless dampened the implied growth by using a percentage projection.

There is one small inconsistency in this method which may be noted. To arrive at an estimate of the combined output of industry and construction, used as the independent variable to project intermediate goods production, an elasticity of 1.4 was used with total product. In fact, the calculated elasticities in 1968, 1969, and 1970 are 1.45, 1.45 and 1.38. It is possible to solve consistently for intermediate production by manupulating its projection equation to express it in terms of all other outputs. The negligible effect on the projections does not justify the additional effort.

One should also note the problem of allocating total supply to its domestic and import sources. The destribution here ought to follow from sectoral estimates of bottlenecks, favorable opportunities for import substitution, etc. Separate equations - which are available for the sub-groups - may be used to determine the approximate price deterrent needed to arrive at the desired proportions. Imports by sector should not be simply projected, however, since this is the one one of the few planning tools available. The allocation actually given here is designed on the assumption that foreign exchange will be allocated so as to permit price control to be applied in the one hand, and positive incentives for production on the other.

TABLE A-2
PLANO TRIENAL ABSOLUTE SECTORAL VALUES
Bill. Cr$ 1953

	1966	1967	1968	1969	1970
TOTAL SUPPLY					
PRIMARY	232.1	250.1	262.2	275.3	289.5
Vegetable	165.7	179.1	188.0	197.7	208.2
Animal	66.4	71.0	74.2	77.6	81.3
SECONDARY	719.8	759.1	826.3	902.3	982.3
Consumer goods	279.2	287.5	303.9	322.2	341.8
Intermediate goods	245.5	256.4	276.0	297.9	321.9
Capital goods	110.8	123.9	141.0	160.2	179.5
Construction	84.3	91.3	105.4	122.0	139.1
TERTIARY					
Services	411.8	430.2	453.4	478.8	506.0
DOMESTIC PRODUCTION					
PRIMARY	225.2	243.2	255.3	268.4	282.6
Vegetable	158.8	172.2	181.1	190.8	201.3
Animal	66.4	71.0	74.2	77.6	81.3
SECONDARY	688.9	724.7	788.0	859.3	934.7
Consumer goods	276.6	284.4	301.3	319.4	338.8
Intermediate goods	229.0	239.4	257.4	276.9	298.7
Capital goods	100.0	110.6	124.9	142.1	159.2
Construction	83.3	90.3	104.4	120.9	138.0
TERTIARY					
Services	411.8	430.2	453.4	478.8	506.0
IMPORTS	39.3	42.8	46.7	51.4	56.0
PRIMARY	6.9	6.9	6.9	6.9	6.9
Vegetable	6.9	6.9	6.9	6.9	6.9
Animal	-	-	-	-	-
SECONDARY	30.9	34.4	38.3	43.0	47.6
Consumer goods	2.6	3.1	2.6	2.8	3.0
Intermediate goods	16.5	17.0	18.6	21.0	23.2
Capital goods	10.8	13.3	16.1	18.1	20.3
Construction	1.0	1.0	1.0	1.1	1.1
TERTIARY					
Net services	1.5	1.5	1.5	1.5	1.5

SOURCE: See Text.

TABLE A-2ª

RATES OF GROWTH OF SECTORAL OUTPUT

	1967	1968	1969	1970
TOTAL SUPPLY				
PRIMARY	7.8	4.8	5.0	5.2
Vegetable	8.1	5.0	5.2	5.3
Animal	6.9	4.5	4.6	4.8
SECONDARY	5.5	8.9	9.2	8.9
Consumer goods	3.0	5.7	6.0	6.1
Intermediate goods	4.4	7.6	7.9	8.1
Capital goods	11.8	13.8	13.6	12.0
Construction	8.3	15.4	15.7	14.0
TERTIARY				
Services	4.5	5.4	5.6	5.7
DOMESTIC PRODUCTION				
PRIMARY	8.0	5.0	5.1	5.3
Vegetable	8.4	5.2	5.4	5.5
Animal	6.9	4.5	4.6	4.8
SECONDARY	5.2	8.7	9.0	8.8
Consumer goods	2.8	5.9	6.0	6.1
Intermediate goods	4.5	7.5	7.6	7.9
Capital goods	10.6	12.9	13.8	12.0
Construction	8.4	15.6	15.8	14.1
TERTIARY				
Services	4.5	5.4	5.6	5.7
IMPORTS	8.9	9.1	10.1	8.9
PRIMARY				
Vegetable	0.0	0.0	0.0	0.0
Animal	-	-	-	-
SECONDARY				
Consumer goods	19.2	- 16.1	7.7	7.1
Intermediate goods	3.0	9.4	12.9	10.5
Capital goods	23.1	21.1	12.4	12.2
Construction	-	-	10.0	-
TERTIARY				
Net services	0.0	0.0	0.0	0.0

Table A-3

The attached Table, whose findings are discussed in Section 9, indicates estimated rates of labor demand over the three years included in the Plano Trienal. The elasticities used to project the labor force requirements come from the observed behavior of agriculture and industry from the late 1950's to the present. The ranges applied to industry reflect the substantial annual variability in industrial employment over this interval; for agriculture, where random variations make annual data less meaningful, a simple average was used.

The estimated industrial demands are confirmed by an independent regression study of labor force absorption by the Industrial Sector of IPEA. The elasticity of employment with respect to output calculated was .426. Applying this parameter to the consumers' goods, capital goods, and intermediate goods sectors yields an estimate of 218,000 new jobs created in these areas over the next three years. The corresponding entry in Table A-3 is between 135,000 and 275,000 new jobs, with the mean equal to 205,000.

TABLE A-3

Employment Absorption, 1968-1970
(millions)

Sector	L_{1967}	$\varepsilon(L/Q)$		$\Delta Q/Q$	$\Delta L_{3 anos}$
Agriculture	13.500	.44	$\times$	5.1	.926
Secondary				8.8	.324 — .515
Consumer goods	1.225	.20 — .40		6.0	.044 — .091
Intermediate	.500	.30 — .70		7.6	.036 — .084
Capital	.340	.40 — .70		12.8	.055 — .100
Construction	.975	.40 — .50		15.2	.189 — .240
Services	10.600			5.6	

3.040

3.24   (4)

350