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# THE USE OF NATIONAL ACCOUNTING FRAMEWORKS FOR ECONOMIC POLICY AND DEVELOPMENT FORECASTING: A SURVEY OF ISRAEL'S RESEARCH EXPERIENCE 1958–61

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## I. INTRODUCTION

THE present paper will describe some aspects of research carried out at the Research Department of the Bank of Israel since 1958 in connection with forecasting and the programming of Israel's development. Work of this kind had already been carried out in Israel at an earlier stage[1] and present research has greatly benefited from it. I shall, however, confine myself to the more recent, though short, experience with which I feel more familiar. Being more of a survey the description will of necessity be rather sketchy and brief, but I shall try to refer to the relevant sources for additional material, in case of interest.

The present phase in the field of analysis and programming of development had its origins in discussions in the Ministry of Finance and the Bank of Israel towards the end of 1957. It was felt at the time that although there was a great deal of Government intervention in many fields of economic activity (such as large-scale promotion of and participation in development projects, export promotion through subsidies and allowances, licensing of imports, and other broad fiscal and monetary measures), and although there seemed to prevail some broad agreement as to the basic aims and needs of this economy (such as the absorption into full employment of large-scale immigration and the gradual closing of a considerable import gap), there had been little in the way of integration of individual sector plans and policy measures into one consistent whole. Need was felt for a long-term macro-economic forecast or plan which could be translated into annual 'National Budgets'. The latter were intended to form the background to the various Government budgets (the Regular, Development, and Foreign Currency Budgets) submitted to Parliament towards the beginning of the

[1] Among the planning projects in the past the ones of widest scope were, notably, carried out by Dr. A. L. Gaathon, first in the Jewish Agency [1] and after foundation of the State of Israel, at the Prime Minister's Office [1a].

personal restitution payments from Germany, gifts and loans from world Jewry and other sources.[1] Also private investments from abroad are becoming a growingly important factor. Some of these sources are expected to dry out over the next three to five years, and one of the main objectives of economic policy is the gradual closing of this gap, while imports go on increasing at a considerable rate. Israel is highly dependent on imports both for productive equipment and for most basic raw materials (imports of finished and semi-finished consumer goods have already been substituted to a large extent by domestic production). When valued at the effective rate of exchange imports constitute some 30 per cent of total resources. Although, of course, the actual increase in imports is dependent on the composition of output (we shall later mention this point again in connection with the choice of a model), imports are bound to go on increasing in the future at only slightly less than the rate of increase in G.N.P. Considerable effort has already been put into the promotion of exports, and the latter have increased from a level of financing only 14 per cent of imports to cover over 50 per cent of the latter today, or at an average annual rate of 21 per cent (slightly less in the second half of the period).

An important point in this context is the required change in the future composition of exports. In the past citrus have formed the main export item (50 per cent of commodity exports in 1950, and still 41 per cent in 1958). Israel commands a considerable share of the world market in this field, at the same time competition from other producer countries is growing from year to year. As a result prices are falling steadily and the rate of increase in export receipts is bound to decline. Thus the bulk of the export effort will have to be carried by the export of manufactures (and to a lesser extent tourism and shipping), which is a relatively new undertaking. By 1965 citrus is estimated to cover only 20 per cent of commodity exports, most of the rest having to come from manufactures. The same is true of import substitution, though the latter offers limited possibilities anyway. In the past much of development could be attributed to substitution of imports, mainly in the field of agricultural foodstuffs and raw materials for industry. In the future any further, though limited, effort in this field will have to be in a few branches of manufacturing (equipment, chemicals and basic metals).

[1] On those and other figures see Bank of Israel Annual Reports [4].

If we now add to all these specific considerations the importance of taking into account varying consumption elasticities for different products, a factor of considerable weight in any country, we can readily see that the composition of demand, both as between exports and other uses and between some manufacturing industries and other branches, is a major factor not to be overlooked in any analysis of Israel's future development.

To sum up this brief sketch of the background to our problem – in the field of long-term development programming the Government economic policy should by now be mainly concerned, not so much with increasing output by more than it has in the past, as long as full employment is ensured (a growth rate of 8–9 per cent or 4–5 per cent *per capita* is considered the optimum which is consistent both with full employment and with other long-term objectives), but mainly by bringing about, through consistent planning, that change in the composition of output which is needed from the long-run point of view.[1] Related to the latter is the problem of bringing about a considerable increase in the share of investment to be financed from domestic savings,[2] while the import surplus gradually declines. The instruments the Government has at its disposal are the Development Budget, through which a large part of development finance goes, trade policy through fiscal measures (high taxes on imports and subsidies on exports as a substitute to actual devaluation – the effective exchange rate is about 40 per cent higher than the official rate), credit policy, and the promotion of savings through taxation and other general policy measures.

[1] The present share of major branches in G.N.P. is approximately as follows: agriculture 11 per cent, manufacturing and mining 21 per cent, construction 8 per cent, transport 7 per cent, services (including Government) 53 per cent. Clearly with these aims in mind the share of agriculture, though low as compared with underdeveloped countries in general, will have to go down slightly, the same with that of services and of construction (mainly housing), while the share of manufacturing and mining will have to go up considerably.

[2] The usual national accounting comparison of net investment with capital imports as an indication of the relative contribution of domestic savings to investments, creates conceptual and statistical problems in the Israeli case, as has been pointed out by a number of economists (see Patinkin [3]). The reason is that a large part of capital imports can be regarded as earmarked for current consumption by its very nature. Partly these are transfers by various non-profit institutions for the absorption of new immigrants and for other welfare (health, education, etc.) purposes. It also includes personal restitution payments in the form of annuities, personal effects, gifts, etc. The exact correction which has to be introduced in the contribution of domestic savings cannot be assessed.

In the corresponding short-run sphere, i.e. in annual national budgeting, the main problem for the economist is that of ensuring the translation of long-term objectives and means (i.e. full employment, appropriate rate and composition of investment and exports, etc.) into annual Government budgets and in addition ensuring that as a result of conflicting short-run and long-term needs no inflationary gap will arise.

## III. THE CHOICE OF TOOLS FOR ANALYSIS

The research staff concerned with the project believed from the start that it could best contribute to the solution of these problems by devising analytical frameworks by which the consistency of different policy objectives and of the means available for achieving the latter, could be checked. Although the state of statistical sources at the time (and to a large extent still today) was very weak, the formal 'Dutch' approach of model building was considered preferable, even if it had to be supplemented by intuition and 'hunches'. With all the reservations that can be made with regard to the formal approach, especially for countries which undergo rapid structural change and for which no reliable statistical data exist, our limited experience has shown us that this form of presentation is preferable, primarily because the simultaneity and interdependence of some important economic relationships are thus brought to the fore much more clearly than by disconnected piecemeal planning.

On the other hand, estimating structural relationships by means of rigorous econometric methods did not seem the proper kind of approach at this stage. Not only is the period for which data exist relatively short (five to eight years in the best of cases), but the changes which the economy is undergoing have been so tremendous that time series analysis of aggregates is of little value even where the data exist. Even if data on overall factor use (such as imports, labour, capital) in relation to output are available, they are of little help when the effect of changing the composition of output is to be analysed,[1] unless these data are supplemented by more detailed cross-section investigations. Thus a completely aggregated model would be of no use.

### *The interindustry and related aggregate models*

The outcome of these considerations has been that for the

[1] Providing, of course, that sectors differ in factor use.

analysis of development alternatives for 1958–64 a crude 20 × 20 input-output model was constructed [5] with which the consistency of various sector plans, long-term objectives and policy measures was analysed [6]. The use of input-output analysis for purposes such as these is all very familiar from other countries' experience (e.g. Italy [10], South America [11]), and I shall only restate the main ingredients of its Israeli parallel:

(1) An estimate of the population increase[1] is made, both from the natural increase and from net immigration. At the same time the expected size of the labour force is estimated.

(2) Using an estimate of the increase in G.N.P. per worker (from past data and some prior guess as to the likely composition of output) and an employment-labour equilibrium condition, we arrive at a provisional estimate of G.N.P. (V).

(3) The expected amount of foreign exchange available from transfers and loans is estimated (F).

(4) An export forecast by sector is made (E) using market research and assuming an accounting rate of exchange[2], (r).

(5) From (3) and (4) we arrive at a provisional estimate of the maximum capacity to import (M), on the assumption of Balance of Payments equilibrium ($E + F = M$).

(6) An estimate of net investments (I) is made, based on sector development plans. Also replacement requirements (R) are estimated.

(7) Public consumption expenditure (G) is estimated on the basis of projected Government social, educational and defence obligations.

(8) Having estimated total resources ($V + M$) and all other uses ($E + I + R + G$), we obtain a provisional estimate of private consumption expenditures (C) as a residual. This, of course, implies a certain rate of savings on which the Government is assumed to exercise some influence (through taxation and other means). The commodity

[1] All estimates are for the last year of the projection period, in this particular case projections were for the fiscal year 1964/65.

[2] This should correspond to the future effective rate (in most cases higher than the current rate) sufficient to ensure the stipulated supply of exports.

breakdown of the aggregate is done by means of estimated expenditure elasticities. These were derived from a study of Family Budgets conducted by the C.B.S. in 1956/7 and were supplemented by estimates from other countries.

(9) Now the final bill of goods ($E + I + R + G + C$) with its commodity breakdown (according to the input-output 20 sector classification) is obtained. Multiplying by the inverse of the input-output matrix we obtain the required production and revised import levels,[1] after some allowance is made for import substitution.[2]

(10) Using estimates of capacity by industry and investment requirements by unit of additional capacity, revised investment requirements can now be estimated. The same is done for labour use.

(11) The stage is now set for a renewed check of the various equilibrium conditions: Import requirements are checked against the capacity to import (Balance of Payments equilibrium), employment requirements are checked against the supply of labour (full employment equilibrium) and capital requirements[3] are checked against savings and the import surplus (savings-investment equilibrium). Also, production and investment levels are compared with individual sector plans where these exist (viz. agriculture, industry, transportation, etc.).

(12) When discrepancies arise in any of the stipulated equilibrium conditions, some of the exogenous or policy variables (e.g. foreign borrowing, the rate of exchange, or the rate of savings) must be modified, and the whole process is started all over again, till a solution, or a series

[1] Denoting the elements of the final bill of goods by $D_i$ and those of the inverse by $r_{ij}$ we have $X_i = \sum_j r_{ij} D_j$ for the output level in sector i and $M_k = \sum_{i,j} m_{ki} r_{ij} D_j$ for imports of commodity k, where $m_{ki}$ are the elements of the matrix of import coefficients.

[2] In the Israeli case, rather than modifying input coefficients, this was done indirectly by constructing a vector of import substitutes (estimated from Ministry development plans, for given effective rates of exchange) and working out the implied production and additional induced imports through the inverse.

[3] This relationship introduces a slight complication in that capital requirements measure a stock all of which will have to be invested before the projection year (assuming a year's lag), whereas we are interested in investments during the same year. To prevent 'dynamization' of the model which unduly complicates matters, net investments for the projection year are related to investments in previous years to allow for 'smooth' growth of capital. Otherwise investments in the projection year would remain indeterminate.

of feasible solutions, are reached[1] by successive approximations.

The first round of this particular piece of analysis in Israel showed that the then existing sector plans would result in an uncovered gap in the Balance of Payments of some 80 million in 1964/5, and that the desired reduction in the import surplus would imply an appreciably higher level of exports and/or import substitution, with corresponding implications for policy. A corresponding correction was then introduced in the policy variables. The analysis also pointed out the large increase that was required in the share of investment to be financed from domestic savings.[2]

The most marked implication, which we have already mentioned in the previous section, was the expected change in the composition of output. Whereas the share of agriculture, construction and services in the increased G.N.P. is going to be lower than their past average share, the analysis pointed out that manufacturing and mining would have to contribute some 35 per cent of the increase in G.N.P. as compared to an average of 21 per cent in the past, and the composition of investment would have to change correspondingly.

The essence of the use of policy models is not so much that of providing the policy maker with *one* solution, but rather to trace out the area of choice and the implications of *alternative* policy measures. The drawback of interindustry analysis is that it is a cumbersome tool. When formalized it boils down to the problem of each time solving a great number of equations in a Leontief closed model. Instead we adopt a short-cut method. Once we are near one solution of the model we can simplify our complicated production function by leaving out the interindustry structure and reducing it into a direct relationship between the final uses or G.N.P. on the one hand, and primary factor use (capital, labour and imports) on the other. The three equations that were actually used were the following:

[1] Clearly in theory, at least, no such solution need necessarily exist. It all depends on the range of variations which is allowed in various parameters (such as the degree of employment, the rate of savings, etc.). For discussion of these considerations see Chenery and Bruno [7].

[2] Although this has not been mentioned in the course of this discussion – in the actual forecast savings were broken down into private and public savings, taking into account taxation, Government transfers, and transfers to private individuals from abroad (included in F).

(1) $V = a_o + a_1 I$ The capital-output ratio.[1]

(2) $L = 1\ (l_o - l_l)^6\ V$. *The demand for labour* (L). $l_o$ is the average labour input per unit at the beginning of the period and $l_l$ is the annual rate at which it decreases.

(3) $M = m_c\ C + m_g\ G + m_i\ (I + R) + m_e\ E$. *The demand for imports* $m_k = m_k\ (r)$, r = rate of exchange, k = c, g, i, e.

All the coefficients of these equations have been estimated from a particular solution to the input-output model for the projection year (in the case of the import coefficients this was done with several alternatives as to import substitution – by varying r – the effective rate of exchange). The latter is the main difference between this and other aggregate models. Here the assumed coefficients anticipate, so to say, their value in a future year, which is different from their present value. The reason why final demand was disaggregated into main uses only in the case of imports is because of the particular importance attached to the foreign trade problem, and also because here the variation between different uses is particularly great[2] and the estimates are relatively more reliable.

If we now add the savings-income relationship and a number of identities we arrive at a complete aggregate model in which the number of policy variables to be solved is greater than the number of equations. Thus 'areas' of choice between policy alternatives can be traced. This model is described in greater detail elsewhere [7].[3] Suffice it to say that with the aid of this aggregate model the main alternatives of development can be investigated and one can always turn back to the more detailed interindustry model for refinement or greater detail where this is needed (e.g. to work out production levels or imports).

*A digression on the National Budget*

In this context of our discussion a brief mention ought to be made of the model underlying the annual forecast in the National Budget. In essence this is an aggregate model very

[1] See note 3 on p. 8 with respect to translation of capital from stock to flow.

[2] The values of these coefficients in 1958 were approximately $m_c = \cdot 15$ $m_g = \cdot 23$ $m_i = \cdot 30$ $m_e = \cdot 40$. See Table 1 on p. 14.

[3] In its reduced form the model consists of the three equilibrium conditions in terms of V and six instrument variables: F, E, G, r, s (marginal savings rate) and e (unemployment rate).

similar in structure to the one mentioned above, mainly in that an equation of import coefficients forms its core. The main differences are the following:

(*a*) Since the analysis is for the subsequent year only, investments appear as an exogenous element in the model.[1] Thus equation (1) drops out.

(*b*) The interindustry model has so far not been used in connection with national budgeting. The above form of import equation has, in fact, already been employed before the 20 × 20 provisional table was constructed. The coefficients were first used in national accounting work by Gaathon [12], who devised ingenious indirect methods for their estimation.[1] Input-output calculations only helped to modify the base year coefficients slightly.

(*c*) In order to be able to say something on the development of prices in the short run (long-term analysis is in constant price terms only), the above model was slightly extended into the nominal field by introducing nominal wages (from declaration of wage policy) and an assumption on distributive shares. By adding estimates of taxes and transfers, private disposable income is estimated and from the latter private consumer demand is derived (assuming a constant rate of private savings). This is then compared to the supply of consumer goods as derived from the 'real' part of the model in order to assess the existence of an inflationary gap.

## IV. IMPROVEMENT OF THE MODEL AND A RELATED DISAGGREGATION OF THE NATIONAL ACCOUNTS

No effective evaluation of the use of these models can be made before actual developments are compared with the forecasts made. Here the trouble is that experience has so far been too short to enable such an evaluation to be made. All one can say at this stage must needs be only of a qualitative nature, judging from provisional estimates of development over the last two years.[2] In two important aspects the long-term analysis

[1] See mathematical appendix to the National Budget for 1958 [8] and subsequent National Budgets [9].

[2] The long-term projection which is here being examined did refer to the whole period from 1958 to 1964/5, which we are still in. We can, however, compare average development in 1958–60 with the average expected development 1958–64, remembering that this has only partial significance.

seems to have pointed in the right direction, even in so far as order of magnitude goes. The required change in the composition of output and investments did, in fact, come about, with the expected relative fall in agriculture and construction, and a corresponding increase in the share of mining and manufacturing.[1] Thus the expected change in composition was correctly estimated. Total G.N.P. increased by slightly more than was assumed. It seems that in the field of the Balance of Payments most values had been underestimated. The 'exogenous' factors, both foreign exchange transfers and exports (mainly in manufacturing) have in practice been higher than expected. Where the model comes in is in the estimate of import requirements. The latter, too, have grown at a higher rate. It has so far not been assessed whether all of it could be explained within the model (both private consumption and exports grew by more), or whether this is to be attributed to insufficient import substitution or, perhaps, because of inventory changes.[2]

Even before the success of the tools chosen can be fully assessed, it is clear that the analysis left a number of important loopholes which should be taken care of in future research. First among these is the analysis of the determinants of private and corporate savings. A number of studies conducted at the Falk Centre and at the Bank of Israel will contribute to the improvement of this part of our models. In the field of factor use, more effort should be put into a breakdown of marginal labour requirements, possibly into main categories. From an economy in which the preservation of full employment had been a major source of worry for the policy-maker, Israel is gradually joining the respectable club of the fully or even overfully employed economies, and shortages in some categories of labour (especially skilled labour in some sectors of manufacturing) are already appearing. More attention should also be paid to the improvement of estimates of capacity and investment requirements.[3]

I should here stress again that the tools so far used for policy

[1] The estimate of total investment is an example where aggregate extrapolations from past trends would lead to wrong results. The relative fall in the share of agriculture and housing (rents) in G.N.P., both of which are relatively capital intensive, implies a reduction in the required rate of increase of total investment. The development of investment during the last two years gives an empirical proof of this fact.

[2] For a more detailed comparison of the forecast with the actual development see [14] Chapter 6.

[3] The earlier analysis has most probably overestimated investment requirements in manufacturing.

models were based on relatively unreliable data. To give an example, the provisional 20 × 20 input-output table was constructed in a period of two months from production and import commodity totals (no breakdown by destination was available at the time, except for a few sectors such as Water, Power and Fuel). The same can be said for the parameters used (capital, labour coefficients and consumption elasticities). It might thus serve as an example of what can be done in the field of model-building even with no time series and with only scrappy cross-section data.

*The detailed input-output table and a suggested disaggregation of the national accounts*

Model-building does, of course, promote additional and more ambitious data collection. This was the case with a very detailed input-output table construction which was started at the beginning of 1959 and finished only a few months ago. The new table for 1958 in its most detailed internally consistent form has some 300 commodities (rows) for both domestic production and imports, and some 150 sectors of production. The largest table so far inverted was a seventy seven-sector aggregation of the latter. For most practical purposes, however, a forty two-sector aggregation will be used. The table is not only more detailed and more reliable in its intermediate entries. In addition it has a more detailed breakdown of primary input (apart from imports):

$W^{I}$ = Wages and salaries (wage earners)
$W^{II}$ = Wages and salaries (self-employed -imputed)[1]
$W^{I} + W^{II} = W$ = Labour remuneration
$D$ = Depreciation.
$P$ = Capital remuneration (rent, interest and net profits).
$T_1$ = Taxes on domestic production.
$T_2$ = Taxes on imports.
$S_1$ = Subsidies on domestic production.
$S_2$ = Subsidies on imports for exports.
Clearly $W + P$ = National Income and $W + P + D + T_1 + T_2 - S_1 - S_2 = V$ where $V$ = G.N.P.

We can now generalize our derivation of an aggregate production function from an interindustry model[2] by extending the

[1] For explanation—see next section.
[2] See discussion on pp. 9–10.

breakdown of primary input by type of final use, to cover all main components of the G.N.P. The following table gives an indication of such a breakdown, by way of illustration, for 1958. The entries were calculated from the 77 × 77 inverse of the detailed input-output table[1] – figures in parentheses refer to percentages of total use:

TABLE I

*A disaggregation of the national accounts for 1958*

(millions of IL. current prices)

| Sales to purchases from | Private consumption | Public consumption | Gross capital formation | Change in stocks | Exports | Total resource |
|---|---|---|---|---|---|---|
| | (C) | (G) | ($I_1$) | ($I_2$) | (E) | |
| Labour remuneration W | 949 (36) | 437 (64) | 395 (43) | 14 (18) | 167 (39) | 1,962 (42) |
| Capital remuneration P | 690 (26) | 37 (5) | 111 (12) | 24 (31) | 123 (29) | 985 (21) |
| Depreciation D | 193 (7) | 15 (2) | 38 (4) | 3 (4) | 41 (10) | 290 (6) |
| Taxes-production $T_1$ | 305 (12) | 18 (3) | 49 (5) | 3 (4) | 16 (4) | 391 (8) |
| Taxes-imports $T_2$ | 142 (6) | 23 (3) | 50 (6) | 5 (6) | 23 (5) | 243 (5) |
| Subsidies-production $S_1$ | −76 (−3) | −1 (−) | −6 (−1) | −2 (−3) | −100 (−24) | −185 (−4) |
| Subsidies-imports $S_2$ | — | — | — | — | −15 (4) | −15 (−) |
| Gross National product V | 2,203 (85) | 529 (77) | 637 (70) | 47 (61) | 255 (60) | 3,671 (78) |
| Imports* M | 398 (15) | 157 (23) | 270 (30) | 30 (39) | 170 (40) | 1,025 (22) |
| Total use | 2,601 | 686 | 907 | 77 | 425 | 4,696 |
| | (100) | (100) | (100) | (100) | (100) | (100) |

* Valued at the official rate $1 = 1L. 1·80.

[1] Some of these (labour and capital) have also been estimated in physical terms (man hours of labour and the stock of capital). These have not been reproduced here.

Clearly for purposes of analysis a different breakdown of final use can be made, depending on the type of model for which the resulting coefficients are required. In addition the figures in a scheme of this kind have alternative uses for policy, such as calculating the effective rate of exchange of imports in different final uses,[1] the burden of indirect taxes on consumption, the relative weight of wages (for wage policy considerations) or the rate of profit on capital (when an estimate of direct and indirect capital use is made), etc.

Some of the problems encountered when adapting the usual scheme of national accounts to the models mentioned, and other questions in connection with national accounting practice, will now be discussed in the next section.

## V. BEARING ON NATIONAL ACCOUNTING CONCEPTS AND MEASUREMENT

We shall now describe some aspects of the interaction of work on policy models and national accounting practice. First, a number of accepted concepts and definitions will be discussed in relation to the analysis described in Sections III and IV. At the end of this section we shall briefly discuss the experience with the problem of provisional estimates and the timing of their publication.

### *Replacement of capital*

The concept of depreciation in the national accounts measures the part of gross investment and product which must be set aside in order to keep the stock of capital intact. An accounting device is usually used – in Israel it is the straight-line depreciation method. The actual productive capacity of an asset does not decline evenly over the period of its life span, it would probably be more reasonable to assume that it is of more or less constant productive capacity till it is actually discarded at the end of its life. The concept of discards, based on this assumption, measures the replacement of the stock of capital through first-year investments. Clearly, both depreciation and discards are accounting concepts. The latter, however, seems the more relevant measure when we want to use the concepts of capital and not additions to stock which approximate productive

[1] $r = 1{\cdot}80 \times \frac{M + T_s - S_s}{M}$.

capacity. This is the case when development planning problems are involved.

The difference of the two measures is a function of the structure and growth of capital in any specific country, and as is well known, in an economy in which investments are growing from year to year depreciation is always greater than discards[1] as thus measured. In a country like Israel, in which the stock of capital is very young and growing at a fast rate, the difference between the two estimates is quite considerable (discards are approximately one-third of depreciation charges). This is the reason why we have decided to use the concept of discards (R) in the analysis described in Section III. In Table I, Section IV, the measure D is that of straight-line depreciation.

*Indirect taxes and subsidies*

Here I would like to discuss two examples. The first one is specific to the input-output type of detailed account and the problem I would like to mention is that of differential pricing of commodities with respect to different destinations. As long as the table is in producer prices (and c.i.f. imports) this problem does not arise in most commodities, since most differences appear in the mark-ups (taxes, subsidies, transportation, trade). There are cases, however, where the product is sold at different prices to different consumers ex factory, owing to deliberate Government policy, and where these would not fall under the ordinary definitions of subsidies or taxes. The two most extreme cases in Israel are water and power. As long as the input-output table is a 'financial' kind of account, which records the actual price paid by different consumers, this raises no problem. The difficulty starts when we want to use it for 'model' or 'real' purposes, i.e. when we want the entry in the table to represent as best as possible the relative physical content of resources going into the transaction. This would be the case when one has to calculate the inverse of the table for, say, estimation of the import content of a commodity in final use. Clearly, if we kept the original valuation of the flow, we would underestimate the relative contribution of factors of production in the case of underaverage pricing of the commodity, and vice versa. The way this was solved in our case was by re-allocation of the flows

[1] The problem is discussed by Domar [13] and in the Israeli case by Gaathon [3], on whose work this discussion is based.

according to their physical content and defining as subsidy or tax any deviation from the average price.[1] As long as we aggregate net indirect taxes over the whole economy this creates no discrepancy with respect to the national accounts, since the 'taxes' and 'subsidies' thus defined cancel out. In Table I, p. 14, these figures were included (amounting to $\pm$ IL. 30 m.)

More important and also more problematic is the case of differential pricing of commodities on the export and home markets. Here again what I have in mind are discrepancies over and above the normal export premiums that would be taken into account in ordinary national accounting anyway.

We first realized that this was a problem when the import coefficient in exports as worked out through the inverse of the provisional 20 $\times$ 20 input-output table turned out considerably lower than that implied by taking the estimates of the Ministry of Industry and Trade, which were worked out for purposes of export allowances.[2] In the former calculation exports were estimated on an ex-factory basis, i.e. including the official premiums, on the assumption that the implied price would more or less correspond to the alternative price which the same commodity would receive on the domestic market. A more detailed investigation showed, however, that this procedure underestimated the real physical content of exports, since the price differential between the export commodity and its domestic counterpart is of larger magnitude than is explained by the official premiums.[3]

[1] This constitutes only a correction of the relative price of these commodities as between consumers, but does not take care of distortions with respect to other commodities. Both power and water are subsidized in the latter sense.

[2] Export premiums in Israel are given on the basis of a special rate of exchange on the value added component in exports. Also, for purposes of the development budget, a calculation of the cost of the dollar earned (or saved – in case of import substitutes) is made for a number of commodities. These calculations give, as a by-product, an estimate of the import coefficient in each export commodity.

[3] There are several possible reasons for this: (*a*) There are a number of additional measures of promotion of exports which have not been taken into account – such as subsidies in the form of lower taxes on raw materials imported for production of exports, cheaper credit, etc. (*b*) For some commodities in which the domestic market is protected the producer acts as a monopolist on the home market and maximizes his profits by differential pricing. Often this takes the form of cartels and other restrictive practices. (*c*) In a large number of cases exports are of an experimental kind or in the early stages of penetration of new markets, and the exporter indeed incurs losses now with the hope of increasing his share of the market in the future. On the other hand, he has no hopes of doing so on the higher-priced domestic market, because it is too limited anyway (a population of 2 million).

To solve this problem when disaggregation of the economy is required one must impute a higher 'subsidy' to exports, which is matched by a corresponding 'tax' on domestic products. In Table 1 the estimate of exports at factor cost includes a correction of IL. 40 m., which is matched by a 'subsidy'. Private consumption has been corrected in the opposite direction.

There is another instance where the use of ordinary evaluation of uses and resources in market prices may lead to wrong interpretations as to the physical quantities which are involved. The more usual problem in the same field is, of course, that of distortions caused by evaluation of the Rest of the World accounts at the official rate of exchange. This problem with respect to Israel has been dealt with elsewhere (Patinkin [2]), and I shall not go into it here. Most of the taxes on imports and the subsidies on exports (see Table 1) are in the nature of a correction to a distorted exchange rate.

*Shares of labour and capital in national income*

When need arises to estimate the direct and indirect primary input of labour and of labour remuneration by commodity, the usual definition of the share of wages and salaries in national income seems inappropriate as a measure for labour in general, since it applies to wage and salary earners only. The problem arises as to how to estimate the correct share of labour, including self-employed, etc. Here again it is a problem of relative importance in each country. It so happens that in Israel wage earners form only some 75 per cent of the total labour force, the rest being self-employed, who are naturally concentrated in agriculture and to a lesser extent in manufacturing, construction and services. I have recently tried to estimate the correction in the estimate of the remuneration to labour and capital by branch of industry, for purposes of I–0 analysis and the more detailed policy model, which I have mentioned previously. The method used was that of imputing to the non-wage earner in each industry the average returns that wage earners in the same industry obtain. The economic justification for this procedure is the assumption that the 'labour' part of the input of self-employed is worth its alternative use as hired labour in the line of production. The remaining part of income originating can then be regarded as remuneration to 'capital' (including, of course, risk, initiative, etc., under the same heading). Soon after

making this estimate I realized that there was 'nothing new under the sun' – Dr. A. L. Gaathon drew my attention to an unpublished paper contributed by Mr. Colin Clark to the 1955 International Conference of the Association for Research in Income and Wealth, in which he made something very similar for some twenty countries.[1] I think Israel would come out quite high in this particular list, if it were ordered by magnitude of the correcting factor.

These figures are summarized in Table II:

TABLE II

*The wages bill and imputed wages by main sector, 1958*

(IL. million, current prices)

| | Wage earners | Self-employed (imputed) | Corrected labour remunera-tion | Corrected capital remunera-tion | Net income originating |
|---|---|---|---|---|---|
| Agriculture | 91 | 122 | 213 | 162 | 375 |
| Manufacturing | 358 | 107 | 465 | 161 | 626 |
| Construction | 158 | 31 | 189 | 44 | 233 |
| Power and water | 26 | — | 26 | −1 | 25 |
| Transportation | 140 | 42 | 182 | 46 | 228 |
| Services and trade | 782 | 108 | 890 | 570 | 1,460 |
| | 1,555 | 410 | 1,965 | 982 | 2,947 |

Next we turn to the general problem of provisional national account estimates.

*The timing of provisional estimates*

The main problem for national budgeting is that of having up-to-date provisional estimates before the year is over, since the analysis greatly draws from current, rather than past, trends.[2]

In Israel, at least, the timing of this process necessitates the working out of provisional data for the whole year in September

[1] Clark's estimate was, however, made for the non-agricultural sector as a whole, whereas we were interested in making a detailed estimate for some forty-two branches of production (including agriculture).

[2] The national accounts have in the last three to five years become of major importance for a number of other policy applications which have not been explicitly mentioned here. e.g. one of the Government and trade-union principles is the adjustment of wages by not more than aggregate N.N.P. The national accounts are also being used for tax policy and for sector planning – mainly in agriculture.

of the same year.[1] Up to a couple of years ago the division of work in Israel has been such that the C.B.S. would mainly work on past data (of, say, at least a year or two back) and the Bank of Israel would prepare the provisional data on a nine months basis, and later for the whole twelve months for purposes of the Annual Report, which is published in May of the subsequent year. This had several drawbacks; the most important of which is the simple fact that it widened the gap between the more basic statistical work in which scientific accuracy came before relevance to practical uses and the more ad-hoc estimation procedures supplemented with intuition and 'hunches' called for by the immediate needs of policy requirements. Both sides clearly suffered from this gap. Nowadays, with the experience of three years' consecutive national budgeting, the national accountants at the C.B.S. have come to realize the importance of gearing the provisional estimating procedures to the time-table and needs of the main consumers of the required statistics. On the other hand, the researchers at the Bank of Israel have come to realize the advantage of having a better-equipped agency to do this important job for them. Problems in this field are, of course, still not absent, but I think all concerned would agree that the experiment had mutually beneficial results. The existence of the Bank Report has moved the date for the first published National Accounts from November of the following year, say, to March or April, whereas the existence of the National Budget meant moving it back by another six months.

All this does not, of course, mean that in all cases provisional estimates are nearly as good as the later final estimates turn out to be. It happened more than once that the discrepancy between the provisional and later estimates for a certain year was greater than that between the latter and the forecast for the same year. This is a natural phenomenon when forecasts are for short-term development which sometimes and for some countries is of a magnitude smaller than the errors in the estimates themselves. The answer to that is to my mind, not to stop making short-term forecasting till the data improve, but rather devote more resources to improve estimating procedures.

Another related question is one concerned with the improve-

[1] This is the time when Budget estimates are being made in the Treasury, and it is, of course, imperative that the economists should be there ready with their first forecasts at the same time.

ment of past data by means of basic research work done in connection with model-building. Here I have in mind the great contribution to the improvement of statistics that input-output work can achieve. Part of the national accounts data are estimated by means of commodity flows – the keys used for the estimation of the shares of final uses in the production of each sector are in part based on relatively outdated estimates. Input-output not only checks and modifies these keys but forms a general accounting framework which is a much more detailed and self-consistent system than the ordinary accounts. The same applies to the estimation of income originating in each sector, and the estimates of distributive shares. The result of the detailed input-output work has been that the basic estimates for 1958 (and correspondingly subsequent years) will have to be modified quite substantially: Private consumption will have to be increased by some IL. 160 m. (over 4 per cent of the previous figures), the change in stocks by some IL. 80 m., and as a result G.N.P. raised by IL. 240 m., i.e. 6–7 per cent.

These are only a few examples of how the estimates and estimating procedures can be improved as a by-product of basic research which is primarily designed for other purposes. Sometimes, of course, one must be careful to keep the development of new tools and the improvement of basic statistics well in balance. A relevant example in Israel is the non-existence of price indices for the deflation of output by sector – the extrapolation from the base year of a detailed interindustry framework is, in fact, impossible without these vital data. It is our general belief, however, that in the long run the development of analytical tools does not hamper but rather gives an incentive to the improvement of basic statistics.

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