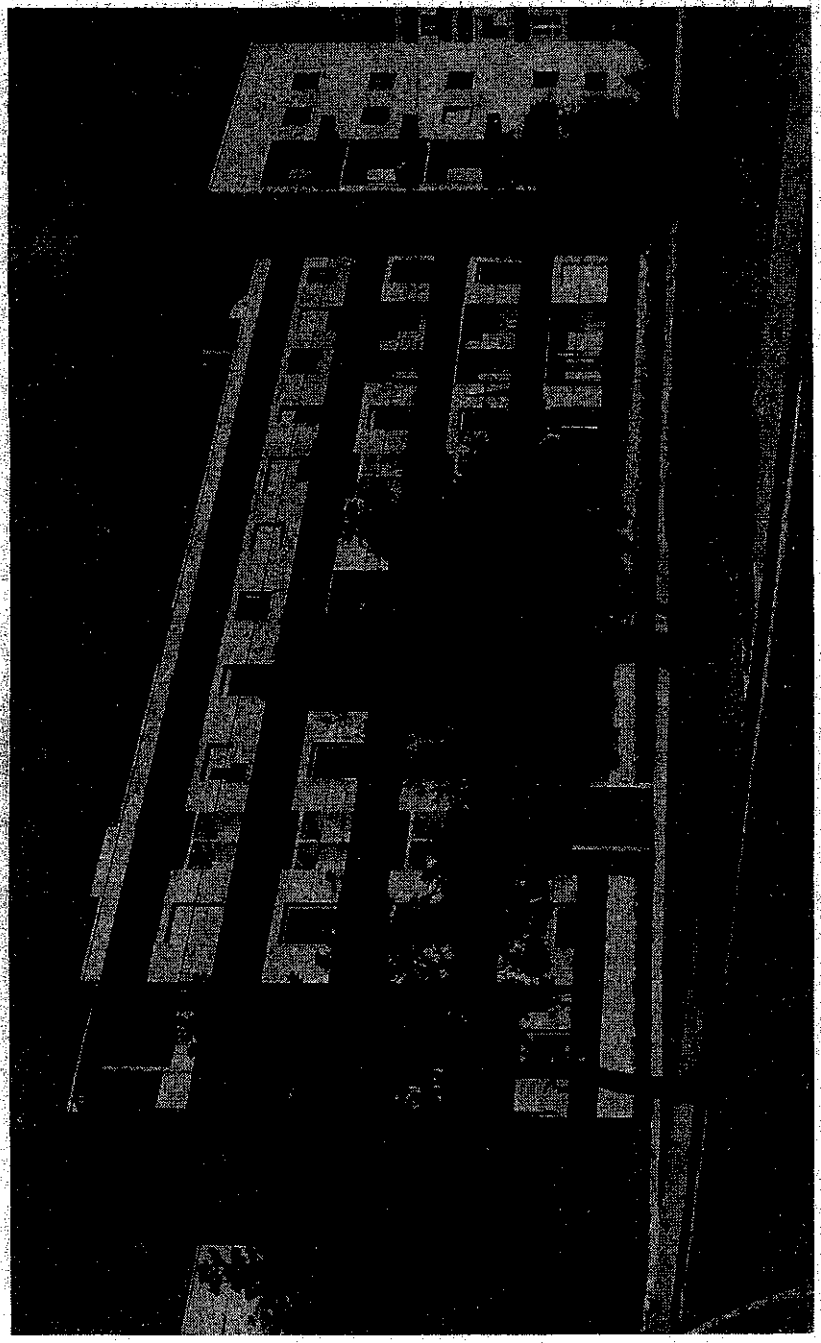
THE FALK PROJECT FOR ECONOMIC RESEARCH IN ISRAEL

A TEN YEAR REPORT

1954–1963



The Falk Project offices (top floor)

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IN ISRAEL

A TEN YEAR REPORT:
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THE FALK PROJECT FOR ECONOMIC RESEARCH IN ISRAEL

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ABBREVIATIONS

CBS — Central Bureau of Statistics

FP — Falk Project for Economic Research in Israel

IL — Israel Pound

NOTE: In the section on Project Reports, wherever a work has appeared in both Hebrew and English the number of pages listed refers to the English edition.

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by

DON PATINKIN

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1. Introduction

One of the tasks that faced the emerging State of Israel in the early fifties was the procurement of data necessary for the formulation of national economic policy. The difficulty of this task can best be appreciated from the fact that there was at the time no systematic statistical reporting of even such basic macroeconomic magnitudes as the balance of payments, the national income, the gross national product, and the like. These lacunae were naturally a matter of concern both to Israeli economists and to foreign experts — among the latter, particularly United States officials who were dealing with that country's loan and aid program to Israel.

As a result of this concern discussions took place in 1953 both in Israel and in the United States which led to a request to the Maurice and Laura Falk Foundation of Pittsburgh, Pennsylvania, to consider establishing an economic research organization in Israel that would help deal with these and related problems. The Foundation agreed to explore this question, and requested A.D.H. Kaplan of the Brookings Institution to visit Israel and make a preliminary survey of needs. Following Kaplan's report the Foundation asked Simon Kuznets and Daniel Creamer to spend part of the winter of 1953–54 in Israel in order to plan the initial program of an organization to be called the Falk Project for Economic Research in Israel. The details of this program were worked out by Kuznets and Creamer after extensive and intensive interviews with Government officials, academicians, and men of affairs. Their concept of the way the Falk Project was to function is most clearly presented in the following excerpt from the First Annual Report of the Falk Project:

"The scope of the Falk Project is intended to be as broad as the range of economic problems that confront a new nation. These problems relate to population, labor force, national income and its components, the cost structure of agriculture and industry, the supply and price of money and credit, the international balance of payments, and kindred fields. The scope extends also to problems arising out of the position of Israel in the world, especially its relations with other states.

"This program of economic research has been designed to maintain a scholarly objectivity in fact-finding and analysis. The findings and the conclusions which they suggest can earn wide acceptance and thereby serve a useful purpose among public officials charged with decisions of state.

In a democracy, the objective analysis can do a great deal toward widening the area of agreement and toward minimizing conflict, especially in areas where dispute arises out of disagreement as to facts.

"The choice of an independent, non-profit organization to foster research and training in economic research was based on well-established precedent. Even in older and richer countries that have eminent records of publicly-supported economic research, it is often found desirable to encourage and rely upon private study. The pressures of government tend to limit the resources that can be devoted to objective scholarship, especially to the exploration of new frontiers of knowledge and application. In the universities, it is also rarely possible to devote the time, or secure the assistance, required for the steady and systematic study of economic facts and issues.

"The decision to support a private organization was also based on a factor unique to Israel. It is a new nation, with social and economic features that require special study. It has distinctive institutions such as the farm collectives, the labor union system, and the Jewish Agency. This uniqueness means that empirical research in Israel cannot be, if indeed it can be anywhere else, a matter of imitation, of adapting ready tools and models to an entirely new situation. All research findings, no matter how factual, must be studied with the awareness that their meaning and significance for public policy will vary under different conditions. Research on the Israel economy would be futile if it did not take into account the distinctive features of this new society. The task of independent research is to scrutinize the prevalent concepts to see whether they should be modified to portray Israel reality more clearly and to examine critically the basic data to see how well they reflect the real substance of economic life. It is no easy task, under present conditions, to subject conclusions to the test of empirical research, and it should not be expected for some time to come that the research needs can be fully met either within the government or the institutions of higher learning."[1]

Kuznets and Creamer also emphasized that — as a transitional phase — it was also incumbent upon the Falk Project "to provide research training opportunities for Israeli scholars."[2]

This was the program which guided the Falk Project when — having received a five-year grant from the Falk Foundation — it began its operations in Jerusalem on January 1, 1954. The first Director was Daniel Creamer, who had agreed to come from the United States to head the Project during its first two years. Creamer returned to the United States at the end of

1 *First Annual Report*, Jerusalem, 1955, pp. 7–8.

2 *Ibid.*

1955 and the Director of Research during the following year was another visiting American scholar — Harold Lubell. The Director of Research after 1956 was Don Patinkin.

The work of the Falk Project during all these years was greatly aided by a United States Advisory Committee composed of A.D.H. Kaplan, Simon Kuznets, Isador Lubin, and Stacy May. Daniel Creamer joined this Committee after his return to the United States. Another — though unofficial — member was J. Steele Gow, Executive Director of the Falk Foundation, whose personal interest in the Falk Project was of great help at every stage. In effect, this Advisory Committee served as the Board of Directors of the Falk Project — approving its research program and budgets; reviewing and criticizing the manuscripts of the various studies; and, finally, approving the manuscripts for publication. Close and valuable contact was maintained with the Committee not only through regular correspondence, but also through the periodical visits of the Project Chairman, Simon Kuznets.

In addition to the U.S. Committee, there was an Advisory Committee for Economic and Social Sciences of the Israel Foundation Trustees. This Committee consisted initially of Roberto Bachi, Alfred Bonné, Louis Guttman, Ernest Kahn, Don Patinkin, Uriel Shalon, and Ernst Vitkon. The composition of this Committee changed with time, and in 1963 Roberto Bachi, Shimon Bejerano, Shmuel N. Eisenstadt, Louis Guttman, David Kochav, Ernst Lehmann, Don Patinkin, Aharon Remez, and Moshe Smilansky served on it. The Israel Foundation Trustees also acted as the Fiscal Agents of the Falk Project.

At the end of 1958, the Falk Foundation — acting upon the recommendation of the U.S. Advisory Committee — approved a second five-year grant for the Falk Project. As this second period drew to a close, the U.S. Committee — together with the Executive Director of the Falk Foundation, J. Steele Gow — began to discuss the possibility and advisibility of converting the Falk Project into a permanently endowed Israel institution with a local Board of Trustees. This question was discussed by Simon Kuznets with various persons in Israel in the spring of 1961. Following Kuznets' favorable report, Gow visited Israel and discussed with leaders in industry, agriculture, trade, finance, and public affairs (including some officials of the Government) the advisability of continuing Falk-financed economic research in Israel. He also carried out discussions with the authorities of the Hebrew University of Jerusalem about the possibility of the University's providing a grant to match one from the Falk Foundation for the purpose of permanently endowing a research institute to be affiliated with the

Eliezer Kaplan School of Economics and Social Sciences of the Hebrew University.

The University agreed to this suggestion and, with the assistance of the United States Agency for International Development, provided its grant. In its negotiations with this Agency, the University was aided by the American Friends of the Hebrew University. In the spring of 1963 the Board of Directors of the Maurice and Laura Falk Foundation approved the corresponding grant of the Foundation. Accordingly, on January 1, 1964 the Falk Project was superseded by the Maurice Falk Institute for Economic Research in Israel.

2. Research Activities [3]

A. National Accounts

As already noted, the Falk Project's original program called for providing training opportunities for economists, as well as carrying out substantive research. In the course of time, it was possible to decrease the relative stress placed on the former objective. For there became available — in part as a result of the activities of the Project itself — an increasing number of Israeli economists experienced in empirical research work.

The increased stress the Project was thus able to place on its substantive research program was accompanied by a change in the emphasis of the program itself. As explained above, when the Project first began its work economic research and policy in Israel were severely hampered by deficiences in the data on the basic national accounting magnitudes. Accordingly, the first years of the Project were devoted to a major effort — in cooperation with the Central Bureau of Statistics — to remedy this situation. Out of this effort there emerged an interrelated group of studies which developed the estimating procedures for these macroeconomic magnitudes and laid down the basis of the later work that has been done in this field. The reference is to Daniel Creamer's *Israel's National Income: 1950–1954*,[4] Harold Lubell's *Israel's National Expenditure: 1950–1954*,[5] and Nadav Halevi's *Estimates of Israel's International Transactions: 1952–1954*.[6] Mention should also be made of three monographs on which the foregoing studies

[3] The following account draws freely on the Introduction to the *Fifth Report* of the Falk Project.

[4] FP and CBS, Jerusalem, 1957.

[5] FP and CBS, Jerusalem, 1958.

[6] FP, Jerusalem, 1956.

drew: namely, Michael Noam, *National Income Originating in Israel's Agriculture, 1952–1954*;[7] Michael Barkay, *The Public Sector Accounts of Israel, 1948/49–1954/55*,[8] and A.L. Gaathon, *Survey of Israel's Economy, 1951*.[9]

By the end of the first five-year grant the current work on these time series had been taken over by the National Accounts Unit (now Division) of the Central Bureau of Statistics and the Research Department of the Bank of Israel. As a result, the Project was able to devote increasing attention to studies with a more direct bearing on general policy questions.

B. Human Resources

From the beginning of the Falk Project's work it was realized that one major area of policy-making in Israel was that dealing with the complex of problems subsumed under the title "human resources." Poor in geographical and mineral endowments, Israel is vitally dependent for its successful economic development on the quantity and quality of its human resources. The framework within which the problems here must be viewed is highlighted by the distinctive cross-classification — by date of immigration and continent of origin — that characterizes so much of the Israel data in this field. Here we have the statistical representation of the fundamental characteristic of Israel — a country facing the problem of integrating immigrants of different origins and length of stay in the country into a social and economic unity.

This "ingathering of the exiles" was the subject of Moshe Sicron's study, *Immigration to Israel: 1948–1953*,[10] on the demographic and occupational structure of the mass immigration which was to more than double Israel's population during the first decade of its existence. Sicron emphasized the inappropriateness of the occupational skills of these immigrants — who were heavily concentrated in commerce, handicrafts, and clerical work — for the development needs of the country. The immigration since 1957 has been distinctly different — from the viewpoint both of numbers and of educational and occupational composition.[11] Nevertheless, the differential situation of new immigrants — and particularly those from Asian-African countries — still constitutes Israel's fundamental social and economic problem.

[7] FP and CBS, Jerusalem, 1956.

[8] FP and CBS, 2 vols., Jerusalem, 1957.

[9] FP and CBS, Jerusalem, 1959.

[10] FP and CBS, Jerusalem, 1957.

[11] D. Patinkin, *The Israel Economy: The First Decade*, FP, Jerusalem, 1959, Chap. 1; *Statistical Abstract of Israel No. 11, 1959/60*, CBS, Jerusalem, 1960, pp. 76–77.

Sicron also studied the effect of the immigration on the structure of Israel's population. This subject was further pursued by Benjamin Z. Gil, who analyzed the effect of the immigration on the geographical dispersion of the population, particularly as between urban and rural areas.[12]

A basic quantitative aspect of Israel's human resources was studied by Avner Hovne in his *The Labor Force in Israel.*[13] Hovne showed that the steady decline in the overall ratio of the labor force to the population from 1948 through 1958 was due to the relative increase in the number of children in the population and to other demographic characteristics of the mass immigration. At the same time, the specific labor-force participation rates of men in general and women of European origin were quite high — and for some groups even increasing. On the other hand, older male immigrants of Asian–African origin — and Asian–African women in general — had very low participation rates. The older men had difficulty in readjusting to new demands; for the women, the traditional family structure militated against labor force participation; and in both cases, low educational levels impeded successful adjustment to the labor market.

In view of the fact that the projection of Israel's population for 1965 indicates an increasing relative importance of children and older people, Hovne also predicted a further decline in the overall rate of labor force participation in the near future. He accordingly concluded that if this decline were to be avoided or reduced, it would have to be done primarily by drawing more housewives into the labor force.

One of the obvious questions that arises with respect to the mass immigration is its impact on the employment and wage situation in the labor market. Hovne pointed out that the sharpness of this initial impact was blunted by accommodating the newly-arriving immigrants in temporary immigrant camps and withholding them for varying intervals from participation in the civilian labor force. This phase was completed relatively quickly, and by the end of 1952 these camps were almost entirely abolished. At the same time the difficulties of absorbing the new immigrants — particularly the unskilled and uneducated — continued to be reflected in the unemployment rate of 11 per cent for 1953, 9 per cent for 1954 and 5–6 per cent for the period 1955–60.

The mass immigration increased not only the overall supply of labor, but also the supply of unskilled labor relative to skilled. This is the back-

[12] Survey of Family Savings, 1957/58, unpublished findings; *Settlement of New Immigrants in Israel: 1948–1953*, FP and CBS, Jerusalem, 1957.

[13] FP, Jerusalem, 1961.

ground of the interesting fact noted by Hovne that increasing numbers of married women of the veteran population — whose levels of education and skills were above average — were drawn into the labor force over the period 1948–55. More generally, Uri Bahral showed in his *Effect of Mass Immigration on Wages, Israel: 1948–1953*[14] that the increased relative abundance of unskilled labor led to a widening of wage differentials in the manufacturing sector. Thus, despite the fact that approximately 90 per cent of Israel's workers are members of the Histadrut (General Federation of Labor) — and that collective bargaining is accordingly almost universally prevalent — there is fairly clear evidence that in this respect labor institutions have adjusted their policies to the forces of the market place. In this way, the Histadrut also gave economic expression to its ideological position in favor of mass immigration to Israel. Nevertheless, it is still an open question whether — from the viewpoint of immigrant absorption — Histadrut policy went as far as it should have both in generating wage differentials and in fixing the price of labor relative to that of other factors of production.

Bahral's findings refer only to wages in manufacturing. But the phenomenon of widening wage and salary differentials and growing inequality in incomes characterized the population as a whole during the first decade of Israel's existence. This was shown in Giora Hanoch's study on *Income Differentials in Israel.*[15] Hanoch's findings refer almost entirely to the urban population — on whose situation detailed statistics exist. But there are fairly good indications that the picture is much the same for the rural population.

The lines of emphasis of Hanoch's study were once again dictated by the distinctive cross-classification described above. In particular, Hanoch showed how the income differentials between new immigrants and veteran settlers, on the one hand, and between Asians–Africans and Europeans–Americans, on the other, both increased over time. What aggravates the seriousness of this problem is the fact that Asian–African families have more children and other dependents than do European–American families — so that even if wage and salary differentials among these groups were eliminated, large differentials in *per capita* incomes would still exist.

The Falk Project also devoted much attention to the educational level and occupational structure of the labor force. Education has been a subject of study for many of the social sciences, each of which has approached it

[14] FP, in press.

[15] Part I of the *Fifth Report*, FP, Jerusalem, 1961.

from a necessarily limited point of view. The same limitation of approach holds true for the economic literature on education. Fully recognizing that education has social and humanistic aspects on which economics has little to say, it has limited itself to the task of studying the impact of the scope and the structure of education on productivity, the level and distribution of incomes, and the growth of national product. This approach emphasizes the role of education as a factor of production, which in turn means that expenditures on it constitute investment rendering productive services to the economy. Correspondingly, every economy must ask itself how much of its resources it wishes to invest in the form of education — and how this investment should be allocated amongst the different forms of education. This was the background of the studies by Ruth Klinov-Malul and the late Yehuda Grunfeld.

The main purpose of the Malul study on *The Profitability of Investment in Education in Israel*[16] is to measure — on the basis of cross-section data from the Survey of Family Savings of 1957/58 — the profitability of investment in education at its various levels, by comparing expenditures at each level to the differential income due to the additional education. In carrying out these computations a distinction is made between the viewpoint of the individual and that of the economy as a whole. The main findings are that from both viewpoints investment in primary education is profitable. Data on secondary education were available only for college-preparatory high schools. It was found that from the individual's viewpoint, investment in these schools is worthwhile only if combined with further investment in higher education. From the economy's viewpoint, however, such a combination is profitable only for higher education in certain fields.

Several attempts were made by Malul to explain these results. It was argued, first, that the percentage of people with secondary or higher education was greater in Israel than in most other countries for which data are available; and, secondly, that the amount of *per capita* tangible capital was comparatively low. This, *ceteris paribus*, should have made investment in education less profitable than in tangible capital, as compared with other countries. The rapid increase over time in Israel's tangible capital indicates, however, that if this explanation is correct, investment in secondary and higher education should become increasingly profitable. The effect of the prevailing egalitarian wage policy on the low profitability of secondary and higher education was also considered.

The high profitability of investment in primary education leads Klinov-

16 Manuscript being reviewed.

Malul to the conclusion that it is advisable to open regular elementary day schools for adults, up to the age of 35, who lack elementary education — provided that an equivalent of full primary education can be attained in a span of about two years.

The Grunfeld study was intended to analyze the role of education — as compared with other factors of production (namely, tangible capital and labor) in the growth of the national product. As a preliminary step, a time series was constructed on total "educational capital" in the economy — defined as the money value of the accumulated investment in education of the entire adult population. Owing to Grunfeld's untimely death, this is the only part of the study that could be completed. Its preliminary findings provide a statistical measure of the well-known fact that the mass immigration into Israel noticeably reduced its *per capita* level of educational capital in the first years of the State's existence. A less-expected finding was that this downward trend probably continued until 1955/56. Furthermore, despite the probable reversal of the trend at that time (a result both of the operation of Israel's educational system and of the higher educational levels of the 1957–58 immigration) the *per capita* level of educational capital in 1958 had still not succeeded in climbing back to its 1950 level.[17] This should be compared with the *per capita* level of tangible capital — which grew steadily over the same period at an annual rate of 6–8 per cent.[18] This decrease in the relative importance of intangible "human" capital in Israel stands in sharp contrast with the view of such economists as Kuznets and Schultz that investment in the intangible capital represented by human resources is an even more essential component of the economic-growth process than investment in tangible capital.[19]

17 Since this part of the Grunfeld study was based on data of the Labor Force Survey of 1954 (the only relevant data available at the time the study was carried out), and since these data were later shown by the Population Census of 1961 to be unreliable, it was decided not to publish this study (see FP *Fifth Report*, pp. 146–50; *Sixth Report*, p. 122). At the same time it should be emphasized that Malul's work on the Census data has verified the general conclusions of the Grunfeld study which have just been cited.

18 See A.L. Gathon's valuable study, *Capital Stock, Employment, and Output in Israel: 1950–1959*, Bank of Israel Research Department, Special Studies, No. 1, Jerusalem 1961, p. 5.

19 Simon Kuznets, "Toward a Theory of Economic Growth," in *National Policy for Economic Welfare at Home and Abroad*, ed. R. Lekachman, New York, 1955, pp. 39–40; and *Six Lectures on Economic Growth*, Glencoe, Ill., 1959, pp. 77–79; T.W. Schultz, "Capital Formation by Education," *Journal of Political Economy*, LXVIII (1960), especially pp. 571, 577–79, and 583.

Another vital aspect of the economic implications of education was brought out in the study by Hanoch already cited. Analyzing the various components of income inequality and the factors that determine income differentials between individuals and groups, he demonstrated that the part of the differentials between geographical-origin and duration-of-residence groups that could stem from direct discrimination is relatively small. Instead, these differentials largely reflect differences in the educational levels and occupational training of the individuals in question. The problem of income differentials is further exacerbated by the fact (shown by Nissan Liviatan)[20] that Asian–African families who are of the same income level and composition as European families nevertheless spend significantly less on education — and that this difference even increases with length of residence in the country. Thus there is no "natural" tendency for these differentials to disappear.

From the foregoing studies one general conclusion would seem to emerge: apart from the all-important cultural aspect, there is a vital economic and social need to increase the amount of resources Israel is investing in its educational system. Not only will such an investment yield a rate of return at least equal to that obtainable on tangible capital, but it can fulfill a vital role in integrating the new immigrants from Asia and Africa into the Israel society, thus reducing the social friction that has continued to exist. Indeed, Hanoch argued that unless decisive action were taken along these lines (e.g., provision of scholarships to high-school students, extension of vocational training for adults, and the like), the extent of the income differentials — and with it, presumably, the degree of this social friction — would even increase. In brief, the successful implementation of Israel's declared aim of "absorbing the immigration" has clear-cut and immediate implications for its educational policy.

If this conclusion is accepted, one further point should be noted. In his study, *The Supply of Professional Manpower from Israel's Education System*,[21] Helmut Muhsam — in collaboration with Giora Hanoch and Ruth Klinov-Malul — showed that the bottleneck in the Israel education system was at the secondary school level. Thus roughly 85 per cent of all the high-school graduates in 1950–53 went on to continue their studies in some form of higher institution. The preliminary results of a subsequent study carried out by the Henrietta Szold Institute for Child and Youth

20 *Consumption Patterns in Israel*, FP, Jerusalem, 1964, p. 67.

21 FP, Jerusalem, 1959.

provided a similar picture for 1955.[22] To the extent that this situation has continued to prevail, any substantial expansion of the number of university graduates in Israel must await the prior expansion of the network of secondary education — and a decrease in the rate of dropout from it.

The most recent Falk Project study to deal with human resources is Yoram Ben-Porath's monograph on *The Arab Labor Force in Israel*.[23] In 1961 the Arabs constituted roughly 11 per cent of Israel's population. They have been a group with special political and social problems and with economic characteristics distinctly different from the Jewish population. Ranked by different socio-economic variables (e.g. education, employment, income) the groups in the Israel population show a more or less fixed scale, with the Arab population at the bottom followed by Jews from Asia and Africa ranged by length of stay in the country, and finally by Jews from other continents of origin.

Most of the Arab population is rural and resides in separate Arab villages. With a rate of natural increase which is among the highest in the world, with a decrease in the amount of land at their disposal in the early years of Israel's existence, and with the absence of any non-agricultural sector to speak of — the Arab population has been dependent on the Jewish market for employment and income. In the first years of Israel's existence, Arab entry into the Jewish labor market was impeded because of security and other considerations. In the course of time, however, these restrictions became attenuated and by the beginning of the sixties almost did not constitute an effective impediment to Arab mobility. Correspondingly, the number and percentage of Arabs employed in the Jewish sector increased. Similarly, there are indications that wages and incomes of Arabs have rapidly risen and may have somewhat reduced the wide gap in income between them and Jews.

Ben-Porath emphasizes that the growing integration into the overall labor force has not been accompanied by growing similarity in the industrial and occupational structure of Arab and Jewish employment. The Arabs are concentrated in agriculture and construction, while the percentage of Jews in these occupations has been slowly declining.

The concentration of Arabs in manual jobs and the rarity of white collar Arab workers can be explained in the first instance by their present level

22 Michael Chen, Rina Doron and Gad Yatsiv, *The Matriculation Examination as a Predictor of Success in Studies*, Preliminary Report, Szold Institute, Jerusalem, 1964 (mimeographed, Hebrew).

23 Manuscript now being revised.

of education and vocational training — though the problem of discrimination does very likely exist as well. The absorption of Arabs in the Jewish market has not been accompanied, so far, by significant residential integration. If this comes, with the resulting integration in education and the like, the future pattern of specialization in the labor market will doubtlessly be affected.

C. *Consumption, Savings and Financial Institutions*

Any attempt to understand the functioning of the Israel economy must be based on a detailed knowledge of its consumption and savings patterns. With this purpose in mind, Liviatan's *Consumption Patterns in Israel*,[24] based on the CBS Family Expenditure Survey of 1956/57 provided the first detailed estimates of the income elasticities of demand[25] of Israel families for the various commodities they consume. Such estimates are, of course, vital to any prediction of the future consumption pattern of the Israel economy. Thus, they have been used by Yair Mundlak and Nadav Halevi in their extrapolation of the demand for foodstuffs in 1965 and 1975 (see below). Similarly, these income elasticities were used by Michael Bruno of the Bank of Israel in his input-output analysis of the Israel economy in order to estimate the breakdown of the "final bill of goods" in 1964. This analysis then formed the basis on which Bruno determined how the various sectors of the Israel economy would have to develop in order to be able to produce this bill of goods.[26]

Liviatan's general conclusion was that the pattern of consumption elasticities in Israel is very similar to that in other countries for which budget studies are available. Those commodities which are income-elastic abroad are also income-elastic in Israel; the same holds true for commodities which are income inelastic. Again, an increase in the number of persons in the family — the income remaining constant — has the same effect as elsewhere on the composition of the family's expenditure.

As expected, there are clear differences in the consumption patterns of families of different continents of origin and times of immigration. Unlike the case of income differentials, however, these differences have in general diminished over time — with the disturbing exception already noted of expenditure on education. What is particularly interesting in this context

24 FP, Jerusalem, 1964.

25 This, of course, denotes the percentage increase in quantity purchased caused by a 1 per cent increase in income — prices remaining unchanged.

26 Michael Bruno, *Interdependence, Resource Use and Structural Change in Israel*, Bank of Israel, Jerusalem, 1962, p. 153.

is Liviatan's demonstration that the convergence of the consumption patterns of these different groups has taken place in different ways — and not only by Asian-African newcomers assuming the habits of European veterans.

The widespread concern which exists in Israel with respect to its savings potentialities is only natural in an economy most of whose investment program has so far been financed by a continuing import of capital from abroad — which must inevitably fall off. The savings surveys of 1957/58 and 1958/59 — carried out by the Falk Project in conjuction with other institutions[27] — show that urban families in Israel save about 5 per cent of their disposable income. This is lower than the savings-income ratio of families in the United States, but considerably higher than in the United Kingdom. In general, the surveys show that there is nothing unusual about the savings propensities of the household sector in Israel. As in many other countries most of these savings are of a contractual type.[28]

Once again, the savings surveys show the differential behavior of the various groups within the economy. In general, the savings ratio of Europeans is higher than that of Asians and Africans; but, in each group, new immigrants save more than veterans. This is probably[29] connected with the tendency of new immigrants to save in order to acquire housing. This points up one of the main policy questions in this area: namely, whether it is possible and desirable to divert the savings that have until now been made so largely for the financing of housing to the financing of other types of investment activity.

If we are to be able to influence the savings behavior of the Israel population, we must first understand the institutions through which most of these savings take place. Rachel Floersheim's study on *Financial Intermediaries in Israel: 1950–1954*,[30] showed how the inflationary developments of that period prevented these intermediaries from fulfilling their traditional function of encouraging savings. This theme also appeared in Meir Heth's *Banking Institutions in Israel: 1950–1961*.[31] Heth pointed out that the inflationary process and the Government counter-measures employed forced the banking

27 Namely, the Central Bureau of Statistics, the Bank of Israel, the Israel Institute of Applied Social Research, and the Department of Economics of the Eliezer Kaplan School of Economics at the Hebrew University.

28 The preliminary findings of the savings surveys — including that of 1958/59 — have been reissued as FP Research Papers 6 and 8.

29 *Survey of Family Savings, 1957/58 (Preliminary Report)*, FP Research Paper 6, Table 10.

30 FP, Jerusalem, 1962.

31 FP, Jerusalem, 1963.

institutions to change the traditional pattern of their activity of receiving demand deposits from the public and making loans to their clients.

The commercial banks on the whole succeeded in adapting themselves to the changing conditions; a considerable proportion of their credit transactions came to be based on the deposits of the Government and other institutions which were not subject to the normal liquidity regulations. The banks also extended their foreign currency and securities activities as well as other types of business. Not all banks were able to adapt successfully — many of the small private banks in existence in the early fifties passed into the control of business groups which wished to acquire independent financial instruments.

The credit cooperative societies failed signally to adapt to the changing situation. Heth ascribed the marked decline in the number and importance of the societies to the composition of their business activities and to the type of clients they deal with, on the one hand; and on the other hand, to the fact that the liquidity regulations made no distinction between them and the commercial banks. In his opinion, the credit societies could have played a useful role in encouraging savings, if only appropriate distinctions had been made; and the credit societies would then have turned to the type of business carried out by the building societies in Great Britain, or by the savings and loan associations in the United States.

Heth's survey of the profitability of banking institutions showed that from 1950 to 1957 there was a constant decline in the profit rate. This was the period when the liquidity regulations impeded the institutions' traditional activities and before most of them had succeeded in adapting themselves to the new circumstances. During 1958–61, there was a noticeable rise in the profit rate — and this process has apparently continued after the end of the period reviewed.

Heth concluded that although the change in the pattern of banking business solved the problem of declining profits, it brought in its train serious problems of policy. Israel commercial banks departed from the traditional sphere of activity of such banks in English-speaking countries, and began to act as entrepreneurs and financiers in industry and commerce. Heth calls upon Israel's monetary authorities to consider the proper policy that should be adopted with respect to this development — which can have a marked effect on the institutional structure of the economy.

The most important institutions dealing with personal savings in the Israel economy are the provident and pension funds — whose role parallels that of the life insurance companies in the United States and the United Kingdom. The activities of these funds were studied by Marshall Sarnat

in his *Saving and Investment Through Provident and Pension Funds: 1952–1961*.[32] One of his most important findings here is that despite the contractual nature of these savings, we cannot assume that all the payments made to these funds represent an increase in the net savings of the economy. In particular, members adjusted their borrowing-back from these funds (and presumably their other forms of savings) so as not to save more than they really desired in the form of financial assets. It is particularly significant that the percentage increase per year in members' borrowing-back was highest during the early years of the period — when the rise in prices was sharpest and when the funds had not yet succeeded in adapting their investment policies to protect themselves against inflationary losses. At the same time, to the extent that this "leakage" was used by the members to finance the acquisition of housing (and this was frequently the case), the overall level of savings in the economy was not affected. All that occurred was a shift in the asset composition of members' savings from financial assets to real estate — a most understandable development during an inflationary period. It might also be noted that the policy of granting loans to members at rates of interest significantly below those obtaining in the market has been an additional factor keeping the demand for these loans at unduly high levels.

Sarnat devotes a good deal of attention to the Government's regulation of provident funds, which in effect began in 1958. One of the stated purposes of these regulations was to get these funds to invest a greater part of their resources in securities — particularly those linked to the cost-of-living index or to the dollar. Sarnat, however, shows that the provident funds had begun to increase their investments in such securities several years before the promulagtion of the Government regulations. Furthermore, he points out that the funds themselves had acted as the "financial innovators" who pressed for the introduction of such linkage clauses in the loans they granted — several years before the mass appearance of linked securities in the market.

Given the nature of pension obligations in Israel and the emergence in recent years of a viable stock market, existing regulations designed to shunt the funds' resources to "approved" linked-debentures do not provide a comprehensive solution for their investment problems. While the Government regulations designed to stem the "leakages" out of current saving should not only be continued, but might well be intensified, Sarnat feels that most of the direct control currently exercised by the Government over

[32] Manuscript now being reviewed.

the composition of provident and pension fund investments should be abolished. As he shows, a similar degree of *de facto* control over investments can be obtained within a much simpler framework — one which would give the funds free access to both the new issue and secondary security markets, thereby removing many of the distortions inherent in the current regulations, while also providing needed support for the secondary market. It might be mentioned in this context that this is in keeping with the widely-accepted objective of developing the security market in Israel as a means of promoting domestic savings.

D. Growth and Structural Changes

One of the most significant features of the Israel economy is its rapid rate of growth. This was studied for the period 1950–58 by Don Patinkin in his *The Israel Economy: The First Decade*.[33] Patinkin showed that Israel's average annual rate of growth in GNP during the period (11.4 per cent) was the highest in the non-Soviet world. On the basis of some crude estimates, he also attempted to decompose this growth into that part due to increased labor and capital and that due to increased efficiency (the "unexplained residual"). He showed that roughly 30 per cent of the increased output was due to the latter cause over the period as a whole, though there was a sharp difference in the behavior of the economy during the period of mass immigration in 1950–54 (when growing efficiency accounted for only 16 per cent of the increased output) and in 1954–58 (when it accounted for 36 per cent).[34]

Patinkin also argued that Israel had not used its rapid rate of growth as much as it could have to decrease its degree of dependence on an import surplus. He also contended that in order to achieve this objective in subsequent years it would be necessary to reduce the extent of investment activity and decrease the rate of growth in *per capita* consumption; and that to effect the reallocation of resources involved in both these policies it would be advisable to devalue the Israel pound.[35]

An integral part of the growth process of any economy are structural changes in the industrial composition of the net national product. We are far indeed from fully understanding the structural changes that have taken

33 FP, Jerusalem, 1960; reprinted from Part I of the *Fourth Report*, Jerusalem, 1959.

34 Ibid., pp. 69–79. A similar picture — on the basis of data which he later constructed on the capital stock of Israel — was given by A. L. Gaathon, *Capital Stock, Employment and Output...*, p. 52.

35 *The Israel Economy: The First Decade*, pp. 138–40.

place in the Israel economy, and we need for this purpose many more monographic studies of its individual sectors. This is the background of the Falk Project studies of Israel manufacturing and agriculture.

Ephraim Kleiman's *Study of Israel's Manufacturing Industries*[36] is based on the CBS Surveys of Industry of 1952, 1955, and 1958. It provides a detailed analysis of this sector by type of product, size of plant, form of ownership, age of firm, and geographical location. Among other things, it is hoped to obtain from this study some evaluation of the Government's policy of dispersing industry geographically — particularly with regard to the various "development areas." Kleiman's study also shows how the small number of firms in each individual branch has left a potentially oligopolistic situation in most of them — which has only been abetted by Israel's highly restrictive tariff policy.

One other question to which Kleiman is devoting attention is the export achievements of the manufacturing sector. This question is significant because the future development of Israel's exports depends substantially on the progress of this sector — which for this reason has been the beneficiary of a widespread system of Government subsidies and supports. Kleiman shows that most manufacturing exports during the period under investigation originated in a small number of branches. On the other hand, there were hardly any manufacturing branches which could be characterized as primarily export-oriented.

The particular period studied by Kleiman also enabled him to point out some consequences of the break-up of the system of price controls in 1951–52. In particular, his evidence indicates that this in all likelihood led to widespread windfall profits (probably due to gains on inventories) throughout the manufacturing sector.

If Israel's manufacturing sector is to sell in the world markets, it must have a competitive cost structure. This problem has not received anywhere near the attention it deserves. However, in the case of one industry at least — cotton spinning — Ruth Klinov-Malul showed that productivity in the more efficient Israel mills in 1955–56 stood comparison with that in veteran producing countries such as Britain and France, and also with Italy and South American countries; but that, nevertheless, the prices of even the most efficient Israel firm (at the official exchange rate then prevailing) were 32–37 per cent higher than those of Italian mills and up to 45 per cent higher than those of mills in the United States. This difference is mainly due to the relatively high factor payments, particularly those to

36 Manuscript being reviewed.

labor.[37] It is dangerous to generalize from this one study, but there is a general impression that wages provide a similar impediment to exports in other industries too.

The structure of the manufacturing sector has, of course, changed significantly over time as a result of the intensive investment program. Some aspects of these developments — in their early stages — were studied by Zvi Citron and Avraham Kessler in their *Investments in Manufacturing Made Through the Investment Center*.[38] This study — which compared the situation at the end of 1954 with that of 1951 — showed that 64 per cent of the firms approved by the Investment Center widened production, 25 per cent produced new end-use products, and only 11 per cent lengthened the sequence of production. There is also a definite impression that approved firms were attracted to the types of production traditional to the Israel economy. These had offered a ready and tested market in the past, and were likely to continue doing so in view of the expected increase in population. As already noted, all this refers to 1954. In view of the extensive investments in manufacturing since then, there is a need to study the problem again a decade later and see how the situation has evolved.

Our knowledge of Israel's agriculture is in many respects greater than that of manufacturing — though here too there are many unexplored areas. Among the first studies started by the Falk Project was one on established family farms (*moshavim*) — as distinct from those of new immigrants. The first step in this study was the collection of data for 1953–54 by means of field surveys directed by Gershon Kaddar. These surveys were subsequently taken over by a unit within the Ministry of Agriculture under the direction of Yehuda Lowe. The data of these surveys were the basis of Yair Mundlak's *Economic Analysis of Established Family Farms in Israel: 1953–1958*.[39] During the period under study, the output of these farms grew steadily — reaching a level in 1958 which was about 50 per cent higher than in 1954. Mundlak decomposes this increase into that part the due to increased productivity (which is shown to have risen at the annual rate of 2.5–4.0 per cent), and that part due to increased inputs (which, during the period studied, primarily took the form of increased inputs of capital and raw materials).

One of Mundlak's most interesting conclusions is that the marginal productivity of land on these farms during the period surveyed was close

37 Ruth Klinov-Malul, *Productivity of Labor and Machines in Israel's Cotton Spinning Mills*, FP Research Paper 4, Jerusalem, 1958, pp. 37–40.

38 FP Research Paper 2, Jerusalem, 1958.

39 FP, Jerusalem, 1964.

to zero. In other words, increasing the landholdings of these farms would not have resulted in any significant change in their output. Mundlak's tentative hypothesis is that this situation was primarily due to the Government's agricultural price policy during the period. By bringing down the price of grains (by means of an artificially low rate of exchange on their import), while at the same time supporting the price of dairy and poultry products, this policy caused the family farms to devote practically all of their productive resources to these two low-land-using products. From this we might conjecture that if the economy is eventually to make rational economic use of the new lands being brought under irrigation, it will have to modify the agricultural price structure so as to increase the relative price of primary commodities, such as grains, industrial crops, and some of the export crops. This will shift resources into these branches, thereby increasing the productivity of land, and thus leading to a substitution of land for foreign exchange.

Mundlak also studies in detail the supply elasticities of the family farms. He shows that the farmers were quite sensitive to market forces — both in their short-run supply response to increase in the prices of poultry products, and in their long-run demand for such durable inputs as poultry barns. Most interestingly, he also shows that the elimination of uncertainty with respect to future prices (by means of Government price guarantees) has a sharp upward impact on the amounts supplied — even at an unchanged price. Hence any Government policy of price supports must bring this factor into account if it is not to result in the generation of "surpluses."

This problem of surpluses was studied from another angle — and within a broader context — by Yitzhak Divon (Honigbaum) in his *Development of Production and Prices in the Vegetable Branch*.[40] In order to deal with the cycles of surpluses and shortages which characterized this branch for many years, the Government set up a Vegetable Production and Marketing Board. Divon showed that this Board failed to remove the "cobweb" of production and prices in this market. His analysis has been only too well borne out by the extreme shortage of vegetables which manifested itself during 1960 — though it must be conceded that other forces were at work too.

The problem of the future development of agriculture has been one of growing concern. On what scale — and in what direction — should Israel's agriculture expand if it is to avoid further exacerbation of the problems of surplus crops? What can be the role of agricultural exports in this expansion? What should be the nature of Government agricultural policy? These were

40 FP Research Paper 7, Jerusalem, 1960.

the basic questions investigated by Mundlak and his co-workers in a study of the *Long-Term Projections of Supply and Demand for Agricultural Products in Israel*,[41] which was carried out under contract with the United States Department of Agriculture and in cooperation with the Department of Agricultural Economics, Faculty of Agriculture, Hebrew University. The estimation of the demand side of this study for 1965 and 1975 was based on a projection of Israel's disposable income for those years prepared by Nadav Halevi. To this projection were applied the estimates of income elasticity of demand for various foods that have come out of Liviatan's consumption study, taking into account the price levels of agricultural commodities as projected for 1965 and 1975. This in turn required knowledge of the price elasticities of demand for the various commodities — which were accordingly estimated.

Clearly, the projection of prices presupposes estimates of the supply side of the market. These were largely based on estimates of the respective production functions of the major agricultural products — making allowance for expected changes in productivity. Estimates were also made of the availability of the major resources to agriculture and their prices. This approach was supplemented with empirical evidence on the responsiveness of farmers to changes in prices, as well as with an attempt to obtain an overall production plan for agriculture which will maximize the contribution of agriculture to the national product, subject to the demand pattern of consumers and the availability of resources.

One of the more interesting findings of this study is that the average annual rate of growth of agricultural production in the period 1960–65 will be 8 per cent as compared with 14 per cent in the period 1949–61. The rate of growth is expected to decrease further in the period 1965–75 to an average level of 5–6 per cent a year.

On the policy side, Mundlak concludes that agriculture in Israel can function efficiently without Government intervention and therefore suggests that the policy of intervention in agriculture can be largely dispensed with, not only on the basis of general principles but also because this is feasible in practice.

Before leaving these structural aspects of the economy, we must emphasize one which is peculiar to Israel: namely, the distribution of national income

41 *Vol. I, General View and Summary*, FP, Jerusalem, 1964, by Yair Mundlak; *Vol. 2, Branch Studies*, FP, Jerusalem, 1964 (mimeographed), by Shaul Ben David, Tuvia Blumenthal, David Braude, Uzi Goldenberg, Eitan Hochman, Yoav Kislev, David Levhari, Mark Wilsker, and Dan Yaron.

originating in different types of economic organizations — private, Histadrut (General Federation of Labor), and Government. A detailed analysis of this distribution was first made by Creamer for the year 1953.[42] The developments in subsequent years were more recently studied by Haim Barkai, in his *Public, Histadrut, and Private Sectors in the Israeli Economy*.[43] Barkai showed that the public and Histadrut shares of net domestic product in 1953–60 were each roughly one-fifth. There was, however, a slight tendency for these shares to rise during the period under study — with a corresponding decline in the private share.

The significant share of resources absorbed by the public sector suggests at once the relevance of the problem of resource allocation between public and private uses. Barkai's data on public-sector investment — which show that about half of annual investment expenditure is made by units belonging to the public sector — should put the investment policies pursued by public sector bodies much higher on the agenda of public discussion that they are today. This is particularly important with respect to major "prestige" projects which Governments may have a tendency to undertake without sufficient regard for economic considerations.

Though the public sector as a whole increased only slightly in the period under question, Barkai shows that that part of this sector represented by public corporations increased very rapidly. In particular, the share of these corporations in the net domestic product increased by 50 per cent, and in 1960 constituted 7 per cent of this product. This points up the increasing importance of devising a more effective system of checks on the efficiency with which these corporations function.

In his analysis of the Histadrut, Barkai devotes special attention to the contribution of the *kibbutzim* (collective settlements) to the net national product. The *kibbutzim* have managed to increase their net product at a higher rate than that of the economy as a whole. Barkai shows that they have succeeded in doing this by means of a radical shift in their industrial structure from predominantly agriculture to an approximately equal emphasis (in 1960) on agriculture and manufacturing. One might say that the enterpreneurial instinct of the *kibbutz* movement has sensed for some time the tendencies revealed in Mundlak's study of a declining rate of growth in agricultural production and has begun to adjust its economic structure accordingly. By doing so, it has succeeded in keeping the rise in its average labor productivity equal to that of the economy. Barkai also notes that

42 *Israel's National Income: 1950–1954*, pp. 37–42.

43 Part I of the *Sixth Report*, FP, Jerusalem, 1964.

per capita income in *kibbutzim* is not much less, if at all, than average *per capita* income in the economy — an outstanding accomplishment for a non-urban economic group. The very success of this policy leads Barkai to pose the question of whether the more restrictive policy which the *kibbutz* movement has recently considered imposing on the trend towards industrialization — mainly because of doctrinal considerations — is sound policy for the long run.

The very success of the diversification policy of the *kibbutzim* may suggest the adoption of a similar policy by the *moshavim* (ccoperative family farms), particularly in many of those established in the early fifties. Barkai's data on net product per employed clearly shows that these are far behind the *kibbutzim* and the economy in general in *per capita* product and income. Yet one wonders if industrialization offers a solution which is consistent with the basic tenet of the cooperative settlement movement — the identification of the production unit with the family. On the other hand, if agriculture cannot provide an "adequate" income, one may ask whether a settlement policy that involves high labor-land ratios is a sound policy. The very low income levels (particularly in the new settlements) implied by the productivity data, and the difficulty involved in the implementation of an industrialization policy which Barkai has underlined, suggest that a thorough review of Israel's traditional settlement policy may be in place.

E. Foreign Trade and the Balance of Payments

The most dramatic index of Israel's economic problem is its balance of payments. Indeed the ratio of Israel's import surplus to GNP has been one of the highest in the world. It is not surprising, therefore, that the problems in this area are very much in the forefront of public discussion — and of Government policy-making. In general, this policy has been one of widespread intervention in the foreign exchange market. And though the degree of intervention has diminisched over the past few years, this market is still characterized by extensive controls.

Government intervention in this area has taken many forms. There is, first of all, traditional tariff policy. This was the subject of a study by Arnon Gafni, Nadav Halevi, and Giora Hanoch which, to begin with, classified Israel's tariffs in 1955–56 into revenue-producing, import-diminishing, and protective.[44] The study showed that much information which was essential for rational formulation of tariff policy was lacking. It also showed that there was a trend toward greater use of tariffs instead of quantitative

[44] *Israel's Tariff Structure and Functions*, FP Research Paper 3, Jerusalem, 1958.

restrictions for import control — and found a necessity for revising the Government's administrative procedure so as to assure a closer connection between tariff and other import authorities.

An analysis of how Israel's exports may, in turn, be affected by other countries' tariff policies was carried out by Nadav Halevi and Giora Hanoch in order to determine the advisability of Israel's joining GATT.[45] The findings of this study were that Israel's exports were not subject to significant discrimination by GATT countries, whereas the discrimination which did exist could continue even within the GATT framework. The study accordingly concluded that the direct economic advantages of membership in GATT for Israel's exports would not be very great, whereas (unless there was to be wide use of escape clauses) such membership would require significant changes in Israel's economic policy — such as the elimination of its present export subsidies. It might be noted that in 1959 Israel did decide to join GATT — though it was probably motivated more by the long-run prospects of trade with Europe than by the immediate stimulation of exports.

Israel trade policy has gone through several stages in the various devices it has adopted to encourage exports. Until 1954–55 (and falling off sharply thereafter) there were concentrated efforts to stimulate exports by means of trade and payment agreements. These were the subject of Avraham Kessler's study of *Israel's Terms of Trade Under Its Clearing Agreements*.[46] Kessler explained here the background of these agreements and also showed that, though both the import and export prices stipulated in these agreements were above the level of international prices, export prices were relatively higher. In brief, the terms of trade which were attained under these agreements were largely favorable to Israel. Kessler concluded that on the whole Israel's clearing agreement program provided some important advantages to Israel, chiefly by creating export opportunities. These advantages were short-run in character and accompanied by serious long-run disadvantages. It was suggested that the reliance placed on clearing agreements had the effect of postponing a direct attack on the basic problems of the cost and competitiveness of the Israel economy.

Exports have also been encouraged by means of both open and hidden export subsidies. These were first granted during the process of carrying out the official devaluation of the pound in 1952–55 — and were extended increasingly afterwards. The two main devices used here — the export

[45] *Israel and GATT*, FP Research Paper 1, Jerusalem, 1958.

[46] FP, in press (Hebrew).

retention scheme (Pamaz) and the premium on value added — were analyzed by David Pines in his *Direct Export Premiums in Israel: 1952–1958*.[47] Pines demonstrated and exemplified the various inconsistencies of these systems — and the misallocation of resources to which they have led. He shows how in the course of time different administrative arrangements were made in attempts to eliminate these misallocations: for example, granting of tariff drawbacks, including indirect imports in the computation of value added, and — most importat of all — eliminating the export-retention scheme entirely (in 1960) while shifting over to direct subsidies. At the same time he emphasized that all these administrative efforts left the system generating many misallocations of resources — and in this respect inferior to a system operating with a uniform rate of exchange.

The problems considered by Pines are part of the more general study which has been undertaken by Michael Michaely in conjunction with the Department of Economics of the Hebrew University on *The Foreign Exchange Rate System and the Effective Rate in Israel: 1949–1961*. Here an attempt is being made to measure the evolution of Israel's foreign exchange system over the past decade and more. By means of the various subsidies, premiums, controls, and the like, the exchange rate system in Israel has been almost from the beginning a multiple-rate system. Indeed, if account is taken of the rates which effectively obtained on various transactions, their number is myriad. One of the first objectives of Michaely's study has been to determine, to the extent possible, the distribution of effective rates that obtained at each point of time. He will then be able to proceed to analyze the fundamental question as to the impact of a multiple rate on imports and exports.

F. Methodological Contributions

As is clear from the preceding record, the main concern of the research program of the Falk Project was to make empirical studies of significant aspects of the Israel economy. In the course of carrying out such studies, however, Falk researchers would occasionally become interested in methodological or analytical problems of a more general nature. In such cases the writers were encouraged to publish their results in the professional journals, and the Falk Project then reissued these articles in its series of Research Papers.

The first such paper was Yair Mundlak's *Empirical Production Function Free of Management Bias*.[48] In his study of the family farms Mundlak came up against the fact that estimates of production functions from cross-section data were likely to be biased, because the management variable is not included in the analysis. To overcome this difficulty, Mundlak in this paper specified a production function which included a management variable, and applied covariance analysis to obtain unbiased estimates. This method requires more than one observation per firm. The paper provides an empirical example and shows that the relative bias resulting from the omission of the management variable can be of considerable magnitude.

Another problem which arose in the family-farm study was that erroneous results are obtained from the distributed lag model when there is a difference between the period of adjustment for which the coefficient of adjustment is defined and the period for which the analysis is carried out. In his *Aggregation Over Time in Distributed Lag Models*,[49] Mundlak showed that, in general, there is no unique relationship between the parameters of the equation pertaining to the period which is represented by the data and the period for which the adjustment is defined. This lack of a unique relationship between the two raises questions as to the validity of some of the empirical results obtained by using distributed lag models.

More general aspects of the problem of achieving empirical estimates of the production function are dealt with by Mundlak in his *Estimation of Production and Behavioral Functions from a Combination of Cross-Section and Final Series Data*.[50] The theory of the firm suggests that the firm decides on output and input simultaneously. This leads to problems of identifications and estimation of the production as well as of specification of behavioral functions. The model proposed by Mundlak in this paper allows for firm and time differences in levels of efficiency and of economic behavior. Previous attempts to obtain estimates in such a framework are considered, and it is shown how cross-section and time-series data can be used in identifying and estimating the functions in question. Several alternate estimates are considered. Mundlak shows that from statistical points of view the methods compare favorably with least-squares estimates.

47 FP, Jerusalem, 1963.

48 FP Research Paper 9, Jerusalem, 1961; reprinted from *Journal of Farm Economics*, XLIII (February 1961).

49 FP Research Paper 10, Jerusalem, 1961; reprinted from *International Economic Review*, II (May 1961).

50 FP Research Paper 13, Jerusalem, 1963; reprinted from *Measurement in Economics: Studies in Mathematical Economics and Econometrics in Memory of Yehuda Grunfeld*, Stanford University Press, 1963.

In the course of preparing his study on consumption patterns in Israel, Nissan Liviatan made some further application of the instrumental-variable method of estimation which he published under the title, *Errors in Variables and Engel Curve Analysis.*[51] In this paper Liviatan dealt with the problem of achieving consistent estimates of the parameters of Engel curve for individual commodities. He showed that an instrumental variable that can serve this purpose is often available in budget data in the form of recorded household income. Though this variable is generally unsatisfactory as an *independent* variable, it still fulfills the requirements of an efficient *instrumental* variable.

Liviatan also applied the method of instrumental variables to certain cases of the distributed lag model, and in his *Consistent Estimation of Distributed Lags*[52] showed how (under specified circumstances) consistent estimates could be obtained by using the lagged values of the exogenous variables as instrumental variables.

In quite another field, Liviatan made use of the fact that the two savings surveys described above provided reinterview data on 1,000 families to test Friedman's hypothesis that the income elasticity of consumption out of permanent income is unity. The results of this test were presented in his *Tests of the Permanent-Income Hypothesis Based on a Reinterview Savings Survey.*[53] On the basis of a number of tests which he devised, Liviatan rejected this hypothesis — though he did reaffirm Friedman's more general contention that this elasticity was higher than that which emerged from the cross-section data.

One other aspect of the savings study that should be mentioned is that relating to the use by individuals of lump-sum personal restitution payments from West Germany. The data collected on this question provide an exceptionally good opportunity for a direct test of Friedman's "permanent income" and related hypotheses. The findings are more or less in accordance with these hypotheses: that is, they show that the beneficiaries of these windfall restitutions treated them largely as receipts on capital account, and not as income to be spent on current consumption.[54]

51 FP Research Paper 11, December 1961; reprinted from *Econometrica*, XXIX (July 1961).

52 FP Research Paper 15, Jerusalem, 1963; reprinted from *International Economic Review*, IV (January 1963).

53 FP Research Paper 12, Jerusalem, 1963; reprinted from *Measurement in Economics...*

54 *Survey of Family Savings, 1957/58 (Preliminary Report)*, FP Research Paper 6, pp. 19–21; and *Survey of Family Savings, 1957/58 and 1958/59 (Preliminary Report)*, FP Research Paper 8, pp. 8–10.

The last of the research papers to be mentioned in this context is that of Uri Bahral on *Wage Differentials and Specification Bias in Estimates of Relative Labor Prices.*[55] In the course of preparing his study on the impact of immigration on wages in Israel, Bahral came to the conclusion that the usual measures of wage differentials to be found in the literature were inadequate for his purposes. Accordingly, in this paper Bahral developed an alternative measure.

3. Concluding Remarks

Though the list of studies just described is long, I cannot end this survey of the Falk Project without indicating other studies which — despite their importance for the Israel economy — were not completed. Among these were studies on the functioning of Government corporations, the inflationary process in Israel, the full and comprehensive study of saving behavior, the role and operation of the Government's Development Budget, and the housing program in Israel.

Studies which are dropped before completion are part of the realities of any research organization. In addition to this usual problem, however, the Falk Project appears to have suffered more than usual from the slowness with which its studies were published. In some cases this delay undoubtedly reduced the public benefit that could have been derived from earlier publication of these studies. In part, this slowness reflected lack of experience at both the research and publication stages. In part, however, it reflected the more fundamental fact that the Project did not succeed in obtaining project supervisors who could devote themselves full time to their research at the Falk Project. The fact that such research could not efficiently be combined with work in the public service or in private business became clear in the very first years of the Project's functioning. Though a combination of Falk research with University duties (which was the pattern that evolved in subsequent years) proved to be far more practical, this too left the project supervisors with inadequate stretches of uninterrupted time to devote to their individual studies.

On the other hand, the developments over the years demonstrated the crucial importance of another aspect of the aforementioned initial program: namely, the decision to have the Falk Project function as an independent organization. There is a clear relation between this independence and the

55 FP Research Paper 14, Jerusalem, 1963; reprinted from the *Review of Economics and Statistics*, XLIV (November 1962).

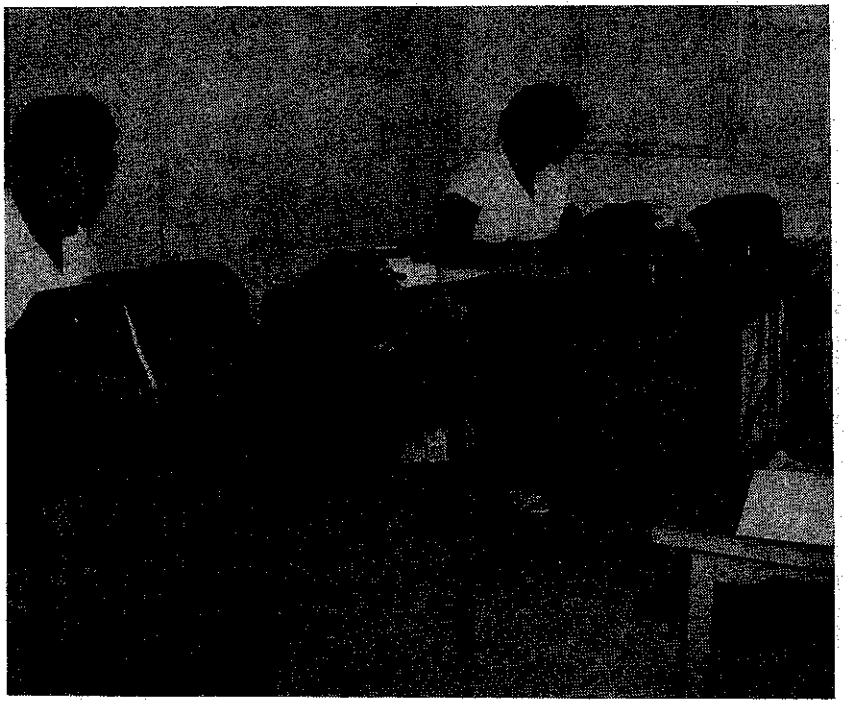
fact that the Falk Project undertook and published studies that dealt with such delicate subjects as income inequality with particular reference to Asian-African Jews, the desirability of devaluing the Israel pound, the role of the Histadrut and Government sectors in the economy, and the like.

It is, therefore, most encouraging that the Maurice and Laura Falk Foundation together with the Hebrew University have assured the continuation of this independent status by establishing the Maurice Falk Institute as the successor organization to the Falk Project. As already noted in the introduction, this change in status has been accompanied by a replacement of the U.S. Advisory Committee by a local Board of Trustees, whose composition is described on p. 109.

The fact that the Maurice Falk Institute will operate on the basis of a permanent endowment will give it a large degree of flexibility, and will enable it to consider undertaking studies of a long-run nature. It is also likely that, as more and more aspects of Israel's economy are studied, the Maurice Falk Institute will broaden its research program to include other countries as well. Similarly, it is possible that the Institute will enter into more general studies of the process of economic growth. Whatever the nature of these future developments, the Falk Institute — like the Falk Project before it — will see as its main function the carrying out of objective and empirically verifiable studies of economic processes, with particular emphasis on Israel.

II

PROJECT REPORTS



The computing room

1. National Income Originating in Israel's Agriculture: 1952–1954, *by* Michael Noam, *1956, mimeographed, 72 pp. (Hebrew and English)*[1]

This work is one of the series of studies in Israel's national accounts undertaken together with the Central Bureau of Statistics. It was not practicable to evaluate the national income originating in agriculture by estimating and summarizing factor shares, owing to the paucity of reliable data on profits and unpaid labor in agriculture. However, output statistics were available. Hence, in conformity with international usage, the author relied on a modified input-output method, after applying a thorough critical revision to the available output data and after preparing his own estimates of input materials and services. Production expenses, defined as "total input *minus* factor share income," were deducted from the output to arrive at national income originating in agriculture.

The author established that production expenses including depreciation accounted between 1952 and 1954 for about one-third of output; value added came to somewhat under two-thirds and was almost entirely devoted to profit, unpaid labor and paid labor. Interest and rent were very low because credit and land were granted cheaply to settlements by the Government and Jewish Agency.

Israel produced a higher proportion of field crop products, vegetables, fruit, and poultry products than most European countries, and a lower proportion of cereals, milk, meat (excluding poultry) and other livestock products. Agricultural production more than doubled in value (at constant prices) from 1949 to 1954. In particular, the areas of industrial crops and plantations rose. Non-Jewish farming accounted for about 13 per cent of total realized output.

Production expenses as a percentage of output were higher in Israel than in most European countries. Extensive use of imported feedstuffs and expensive packing materials necessitated by the export of citrus largely account for this.

Agriculture in Israel contributed 12–14 per cent to the net domestic product. About 18 per cent of the labor force was employed in agriculture. This is comparatively low in view of the fact that Israel is not a highly

[1] In conjunction with the Central Bureau of Statistics. Technical Notes published in a separate volume in English only (mimeographed).

industrialized country. More up-to-date information appears in the author's latest publication.[1]

2. ESTIMATES OF ISRAEL'S INTERNATIONAL TRANSACTIONS, 1952–1954, *by* Nadav Halevi, *1956, 139 pp. (Hebrew and English)*

This is one of the first attempts to present authoritative, detailed estimates of Israel's international transactions for the period considered, and in particular to arrive at a reliable estimate of the balance of payments. The estimates are prepared according to the general concepts and classification scheme set out in the International Monetary Fund's *Balance of Payments Manual*. Each table is accompanied by a detailed description of how it was derived.

Part I of the study discusses concepts of measuring international transactions and presents summary estimates. The author suggests an alternative presentation of the balance of payments in a three-part form, with a division into Goods and Services, Unilateral Transfers, and Movement of Financial Claims, and a supplementary table describing each section. Part II shows in detail how the various items were marked out and what sources were available.

3. SETTLEMENT OF NEW IMMIGRANTS IN ISRAEL: 1948–1953, *by* Benjamin Z. Gil, *1957, mimeographed, 239 pp. (English)*[2]

The principal source for this study was the Population Register, which was updated in 1954.

In May 1948 when the State of Israel was declared, there were 650,000 Jewish inhabitants. Between that date and September 1953 over 700,000 Jewish immigrants arrived, mainly from Africa and Asia. The proportion of Jews from these countries in the population rose from 22.5 to 42 per cent. These groups are noted for their high birth rate and large proportion of young. Thus the birth rate in the population and the size of families both increased, while the proportion of earners decreased.

In 1948 over half of the Jewish population was concentrated in Tel Aviv

[1] M. Noam and H. Regev, *National Income Originating in Israel's Agriculture (Input, Output and Value Added)*, Central Bureau of Statistics, Special Series No. 165, in press.

[2] In conjunction with the Central Bureau of Statistics.

and Jerusalem; rural population amounted to 15 per cent. With the establishment of the State a policy of planned agricultural settlement was initiated. Hundreds of thousands of immigrants were directed to less densely populated regions, with the result that population resident in the northern district increased from 8.7 to 10.4 per cent in the period under review, while that in the partly semi-arid southern district increased from 0.9 to 4.1 per cent. Jewish rural population increased to 23 per cent of total population.

The concentration of new immigrants in the rural districts (60 per cent of population in the southern district came from Asia and Africa) caused these districts to have demographic structures different from the rest of the country. For example, the crude birth rate in the southern district is 47 per thousand, as compared with 22 per thousand for Tel Aviv and Haifa. The author fears that these variations, combined with different geographical and economic structures, may create socio-economic regional differences in Israel, unless a well-planned policy succeeds in eliminating them.

4. ISRAEL'S NATIONAL INCOME: 1950–1954, *by* Daniel Creamer and Others, *1957, 115 pp. (Hebrew and English)*[1]

This is the first attempt to estimate national income in Israel by distributive shares, in addition to the estimate by industrial origin. It consists of independent estimates for the years 1952-54 and adjustments of former estimates for 1950-51. Following an explanation of methods of arriving at the estimates and sources of data, some general trends during 1950-54 are described.

The record of national income after adjustments for changes in population and prices indicates that until 1954 the annual changes in real national income *per capita* were small. But the cumulative rise between 1950 and 1953 amounted to 8 per cent, which suggests that Israel did more than maintain a constant level of real income *per capita* between 1950 and 1953, when its population increased by 30 per cent. Between 1953 and 1954, when immigration was reduced to a trickle, there was another rise of about 8 per cent in real national income *per capita*.

The estimates are also used to throw some light on the industrial and organizational structure of the Israel economy. For example, agriculture, five years after the founding of the State, accounted for about one-eighth

[1] In conjunction with the Central Bureau of Statistics.

of Israel's net domestic product. This represents a pronounced transformation in the traditional sources of income of Jewry in the Diaspora. As to the organizational structure, the estimates reveal that Government business enterprises, including the railroad, post office, and telephone, accounted for 5 per cent of the net domestic product in 1953, while the enterprises owned and operated by the trade union federation (Histadrut) amounted to 8 per cent. Collective and cooperative organizations, operating chiefly in agriculture, contributed about 3 per cent. Private enterprise — proprietorships and companies owned by individuals — originated more than half of the total net domestic product, and the regular agencies of the Government — national and local — about one-fifth.

Seven appendices show in detail methods of estimation and sources.

5. IMMIGRATION TO ISRAEL: 1948–1953, *by* Moshe Sicron, *1957, 137 pp. (Hebrew and English)*[1]

This study presents the results of an analysis of the composition of immigrants on arrival in Israel during the first years of the State. The first group of chapters appraises the size of the various waves of immigration after the establishment of the State, as compared with those of the mandatory period. It also gives details of the countries of origin of immigrants and their effect on the size of the total Jewish population of Israel.

The second group of chapters describes in detail the structure of immigration by age, sex, marital status, family structure, labor force participation, and occupation. The distribution of each characteristic is compared with the distribution in pre-State immigration, and, where data are available, with distributions of other international migrations. An attempt is also made to measure the changes in the existing distribution of characteristics of the population resulting from the immigration. Finally, an appendix gives the main data on immigration up to the end of 1955.

Throughout the book, Mr. Sicron appraises the basic data used, describes the changing sources of the data, and deals with their significance as influenced by the political organization of the country during various periods. In this connection, a solution is offered to the difficult problem of estimating the size of "illegal" and "unrecorded" immigration during the mandatory period.

Mr. Sicron's analysis confirms and extends previous findings about

[1] In conjunction with the Central Bureau of Statistics.

certain peculiarities of immigration to Palestine and Israel. The cyclical aspect and the changing direction of this immigration is pointed out. The different characteristics of the post-State "mass" immigration of entire communities with pre-State "selective" immigration are emphasized. The importance of immigration to Israel can be gauged by two facts relating to 1953: the overwhelming majority of the population was foreign-born; and 55 per cent of the foreign-born were in the country five years or less.

The *Statistical Supplement* consists of 105 tables and comprises, in large part, hitherto unpublished data from the Central Bureau of Statistics. The tables are conveniently arranged in order parallel to the chapters of the text.

6. ISRAEL AND THE GENERAL AGREEMENT ON TARIFFS AND TRADE, *by* Nadav Halevi and Giora Hanoch, *1957, mimeographed, 73 pp. (English)*[1]

The possible effects on Israel's exports of Israel's joining the General Agreement on Tariffs and Trade (GATT) are explored in this study. At the time of the study Israel was not yet a member of GATT, but many GATT countries accorded to Israel GATT tariff rates (though not necessarily most-favored-nation treatment). The share of GATT countries that did not accord Israel GATT tariff rates was only 6.5 per cent of Israel's total exports in 1956.

The main explicit advantage to be gained from membership in GATT is the stimulus to exports which tariff reductions can give. On the basis of the then existing situation, it appeared that Israel's exports had little to gain from such membership. However, the relatively small size of exports to GATT countries that do not accord GATT privileges to Israel may have been a result of tariff discrimination, while the expansion of Israel's exports may require inroads into markets at present insignificant.

The relative importance in total Israel exports of commodities discriminated against determines the effect of the discrimination. Thus, discrimination against citrus fruit and diamonds — which form a large part of Israel's exports — bears grave consequences. Within the framework of GATT a country like Israel would be able to benefit from escape clauses, e.g., with regard to balance-of-payments difficulties. The operation of a proposed clause on subsidies (which tend to increase exports or decrease imports) would mean radical changes in Israel's present economic structure. Loss

[1] A Hebrew summary appeared in the *Economic Quarterly*, V (November 1957), and was issued, together with an English summary, as Research Paper 1.

of revenue and protection may also result from tariff reduction, and lack of tariff flexibility may prove an economic drawback and might even hamper the elimination of quantitative restrictions — one of GATT's important principles.

Many GATT countries would still be permitted by virtue of preferential concessions and escape clauses to discriminate to some extent against Israel, even if she were a member of GATT. Moreover, countervailing duties are permitted to nullify the effect of export subsidies. The study concludes, therefore, that the direct advantages of Israel's membership in GATT would not be very great, whereas such membership would demand significant changes in Israel's economic policy.

7. THE PUBLIC SECTOR ACCOUNTS OF ISRAEL: 1948/49–1954/55, *by* R. M. Barkay, *1957, 2 vols., mimeographed, 362 pp. (English)*[1]

This study consists of an 82-page essay followed by appendices, tables, and statistical accounts. The essay discusses the changing role and the functions of the public sector, the basis of the accounts. and the consolidation of the public sector agencies; it then considers separately the accounts of the central government, local authorities, and the national institutions. However, this work does not attempt to interpret the wider connotations of the findings.

The first appendix contains a detailed discussion of the "economic" classification of public sector accounts, as contrasted with the "functional" classification also used in the study. The "economic" classification breaks down public sector outflows into (a) current expenditure (consumption expenditure, interest on public debt, current transfers to households and private nonprofit institutions, and subsidies); (b) capital expenditure (from gross capital formation and capital grants); and (c) financial outflows (investment in securities, loans granted, and outflows resulting from decreases in financial liabilities). A similar three-account classification has also been made for the inflow side. The "functional" classification shows the major purposes of public sector agencies, such as general administration, defense, health, and education. These two classifications are also combined in a matrix for each year.

Another appendix presents a model set of accounts for use by public sector commercial enterprises. The remaining appendices consist chiefly of statistical material and the derivation of the separate accounts.

1 In conjunction with the Central Bureau of Statistics.

8. INVESTMENTS IN MANUFACTURING MADE THROUGH THE INVESTMENT CENTER, *by* Zvi Citron and Avraham Kessler, *1958, mimeographed, 69 pp. (English)*[1]

This study compares firms granted the status of "approved enterprises" under the Law for the Encouragement of Capital Investment in the period 1948–54 with the rest of Israel industry. Two hundred and eighty-five firms were approved in all branches of manufacturing, contributing greatly to the growth of the plastics and rubber industries. However, negligible growth impact was recorded in the diamond and clothing and footwear industries. All in all, approved enterprises resulted in a 13 per cent growth in the number of manufacturing establishments.

In addition to the new enterprises, extensions to 75 existing firms were approved. Only a small number of expansions of existing firms were found valid for approval according to the criteria applied by the Investment Center.

The new firms employed more workers than similar existing firms, on the average. Eleven per cent of the approved firms produced commodities, serving as a basis for end production, which had previously been imported; 25 per cent produced commodities requiring little processing but which had not been made previously in Israel, and 64 per cent increased production of commodities already manufactured in Israel. This latter group included 85 per cent of all extensions.

The approved new firms produced 60 per cent non-durable goods and 40 per cent durable goods, the same proportion as industry in general. However, firms with approved extensions produced 70 per cent non-durable goods in their expanded facilities.

This concentration in non-durable goods is even more striking when persons employed, rather than number of establishments, are considered: 75 per cent of persons employed in approved extensions produced non-durable goods, as compared with 50 per cent in approved new firms and 60 per cent in industry in general.

New approved firms employed 80 per cent of the workers they had anticipated employing when submitting the request for approval. The firms with approved extensions increased employment by 25 per cent. It was found that firms with a larger investment needed a longer gestation period.

1 Hebrew and English summaries issued as Research Paper 2.

9. ISRAEL'S NATIONAL EXPENDITURE: 1950–1954, *by* Harold Lubell and Others, *1958, 93 pp. and appendices 58 pp. (English)*[1]

This monograph completes the series of basic national accounts studies undertaken by the Falk Project in collaboration with the Central Bureau of Statistics. It first presents the commodity flow data which build up to the national expenditure aggregates, and then ties these into a system of national accounts using the results of the previous studies in the Falk-CBS series.

The gross national product estimates in the report are examined from two points of view: as an indicator of national welfare (by examining levels of output at any given time and by evaluating changes in output over time); and as a means of measuring the allocation of national resources. Over the period 1950–54, aggregate gross national product in constant prices rose by 62 per cent. Although most of this increase was absorbed by a 33 per cent increase in population, real product per capita rose by 22 per cent over the period, reaching a level equivalent to about $600 a year in 1954. The breakdown of the national expenditure shows that gross domestic capital formation absorbed about one-quarter of Israel's gross national product over the period; most of this, however, was financed by a balance-of-payments deficit equivalent to about one-fifth of the gross national product. One of the interesting facts emerging from the statistics is that Israel showed a low overall incremental capital-output ratio from 1950 to 1954; if housing is included, somewhat over two units of capital formation were required to produce a unit of increased national product; if housing is excluded, somewhat over one unit of capital formation was required.

A detailed description of the sources and methods used for estimating the flow of commodities and selected items of final expenditure is presented. A description of the contents of the national accounts flows is also presented.

10. SURVEY OF ISRAEL'S ECONOMY 1951, *by* A.L. Gaathon, *1959, mimeographed, xxv + 389 pp. (English)*[2]

This is a pioneer work in the field of national accounts and their use for economic analysis in Israel. Input-output techniques are applied to the

1 In conjunction with the Central Bureau of Statistics. Chapters 1 and 2 published in Hebrew as Research Paper 5.

2 In conjunction with the Central Bureau of Statistics.

economy and its branches. In addition to chapters on population and employment and the macroeconomic components of gross product, attempts are made to measure the price and volume changes of output and net product of the agriculture, manufacturing, building construction, and transportation sectors, as well as for personal consumption and for capital formation, from 1950 to 1951. As far as feasible, the output of each sub-branch of these sectors was broken down by main commodities, in volume and in value. Domestic and export markets and marketing prospects were analyzed. The input was broken down focussing upon the net value added, indirect taxes and subsidies, the import component, the employment volume and its composition, and the fixed assets used in production. Also the plans for expansion of capacities, as far as ascertainable, were pointed out.

In his appraisal of developments in 1951, the author states that the year was marked by severe economic difficulties. These stemmed largely from two maladjustments: the lag of real capital formation behind the increase in population; and the lag of capital supply behind real capital formation. The former disequilibrium caused thousands of new immigrants to stay idle in camps while funds destined for capital formation were spent on their maintenance. The latter meant that the Government had to supplement the inflow of donations and long-term capital not only by the liquidation of foreign assets, but also by short-term loans from abroad and from the banks in order to finance real capital formation.

11. THE SUPPLY OF PROFESSIONAL MANPOWER FROM ISRAEL'S EDUCATIONAL SYSTEM, *by* H.V. Muhsam, Giora Hanoch and Ruth Klinov-Malul, *1959, ix + 127 pp. (Hebrew, with English summary)*

In this study the authors measure the drop-out by pupils at various levels from elementary school to higher studies — with particular regard to the stage between the end of secondary school and entry into higher institutions when most youngsters are enlisted for military service. An attempt is also made to analyze the factors which influence the choice of institution and subjects of study of those continuing beyond the secondary level, as well as the motivation of those who do not enroll with institutions of higher education.

It was found that 83 out of every 100 pupils starting elementary school actually finish. Of these, 60 continue their education, but only 32 in secondary schools which prepare pupils for matriculation examinations. Of the latter, 16 reach the stage of sitting for the matriculation and nearly all

of these continue their studies sooner or later. Hence the bottleneck limiting the supply of students for the higher institutions is to be found within the secondary school system. The above estimates are averages of 3–4 years, and most of them relate to the first classes completing secondary school after the establishment of the State.

Israel secondary schools are not the sole suppliers of students for the higher institutions: some 30 to 40 per cent of the students are graduates of secondary schools abroad.

Approximately 38 per cent of pupils entering higher studies enroll at the Hebrew University, about 27 per cent at teachers training colleges, some 18 per cent at the Technion—Israel's Institute of Technology—and around 8 per cent go abroad for further study. Boys generally go to the Hebrew University and the Technion while most girls prefer the Hebrew University and teachers training schools. Those with relatively higher marks in their matriculation examinations are more common at the Hebrew University than at other institutions in the country.

The drop-out of students during higher studies was examined only at the Technion, where it was found to be fairly low — 13 per cent.

12. THE ISRAEL ECONOMY: THE FIRST DECADE, *by* D. Patinkin, *with a* FOREWORD *by* Simon Kuznets, *1960, 155 pp. (Hebrew and English)*[1]

One of the major achievements of the Israel economy in its first decade was its integration of an almost doubled population into its productive labor force. This increase in labor force was the main cause of the growth of Israel's real GNP by roughly two-and-one-half times during the period 1950–58. This represents an average rate of growth of 11.4 per cent a year. Of this, about 60–70 per cent may be explained as being the result of the increased inputs of labor and capital over the period. Correspondingly, about 30–40 per cent reflects the increased efficiency with which the economy carried out its production.

Israel's economic development has been based on an intensive investment program which has absorbed on the average 21 per cent of its total resources and 26 per cent of its GNP. The ultimate source of financing the development program has been the import surplus — which aggregated 3,000 million 1952 dollars during 1950–58.

Israel's import surplus has been financed by continued foreign borrowings, as well as by unilateral transfers. As a result, Israel's foreign debt has grown to roughly half-a-billion dollars. If Israel is to move close to economic independence, it will be necessary not only to continue increasing its GNP, but also to change the structure of this GNP radically in favor of import substitutes and exports.

1 Reprinted from the FP *Fourth Report*.

The generally rapid rate of growth in Israel's GNP provides it with the basic potential to make rapid progress toward greater economic independence. But in order to realize this potential it will probably be necessary to effect changes in certain policies. First, it will probably be necessary to reduce the relative extent of investment activity. Second, it will be necessary to decrease the rate of growth in *per capita* consumption, i.e., to increase the rate of growth in domestic savings. For both objectives — and primarily for the first — it will be necessary to make changes in the present allocation of resources. The market mechanism could probably be used here to greater advantage than it has been heretofore.

13. THE LABOR FORCE IN ISRAEL, *by* Avner Hovne, *1961, 88 pp. (Hebrew and English)*

The study shows that the steady decline in the overall ratio of the labor force to the population from 1948 through 1958 was due to the relative increase in the number of children in the population and to other demographic characteristics of the mass immigration. During the same period, the specific labor force participation rates of men in general and of women of European origin were quite high, and for women even increased. On the other hand, older male immigrants of Asian-African origin, and Asian-African women in general, had very low participation rates. The older men had difficulty in readjusting to new work demands; traditional family structure militated against labor-force activity of the women; and, in both cases, low educational levels impeded successful adjustment to the labor market.

In view of the fact that the projection of Israel's population for 1965 indicated an increasing relative importance of children and older people, the study predicted a further decline in the overall rate of labor-force participation in the near future, unless still more housewives were to be drawn into the labor force.

One of the obvious questions that arise with respect to the mass immigration is its impact on the employment and wage situation in the labor market. The study points out that the sharpness of the initial impact was blunted

by accommodating the newly arrived immigrants in temporary immigrant camps and witholding them from participation in the civilian labor force. This phase was completed rather quickly, and by the end of 1952 the temporary immigrant camps were almost entirely abolished. However, the unemployment rate of 11 per cent in 1953 was a clear reflection of the difficulties created by the mass immigration of 1948–51. The unemployment rate fell to 9 per cent in 1954 and showed a downward trend — at around 5–6 per cent — for the period 1955–60.

14. INCOME DIFFERENTIALS IN ISRAEL, *by* Giora Hanoch, *1961, 94 pp. (Hebrew and English)*[1]

The phenomenon of widening wage and salary differentials and the growing inequality of income has characterized the population of Israel as a whole over the past decade. This study deals almost entirely with the urban population, but there are fairly good indications that the picture is much the same for the rural population.

In 1957–58 the poorer half of families received one-quarter of the total income and the richer half received three-quarters. While the overall inequality of income in Israel is narrower than that found in Western European countries, the trend toward wider inequality in Israel is contrary to that taking place in most of the developed countries, where inequality has tended to narrow during the last few decades. It is reasonable to expect a reversal of this trend in Israel in the long run with the full absorption of the immigrants, the spread of education, and the removal of social and economic barriers.

A study of the inequality of income found between the averages of various social and demographic groups, and particularly the differentials on the basis of country of origin and duration of residence, leads to various conclusions. First, the longer the period of residence of any group, the higher its income. Second, there are considerable income differentials between persons from different countries. Similar differentials, though of smaller magnitude, exist when the raw averages are adjusted to take account of the differences in education, age and other factors.

The gap in income between country-of-origin groups has increased in recent years, mainly due to differences in education among newcomers. However, if some sort of direct discrimination does exist between equally

1 Published as Part I of the FP *Fifth Report.*

educated immigrants of the same age from Eastern and Western countries, it is small and tends to be eliminated in the course of time when the newcomers become veterans.

In comparing the inequality of income within the groups, it was found that it is wider among Asians-Africans and new immigrants than among Europeans-Americans and veterans, even after adjustment for occupational and family-size differences, and after eliminating an estimate of the transitory variation of incomes. It appears that the new immigrants from Asia and Africa suffer from a considerable instability in the flow of their incomes in addition to their low average incomes and standard of living.

The key to the social and economic absorption of these people lies in raising their level of education and occupational skills.

15. FINANCIAL INTERMEDIARIES IN ISRAEL: 1950–1954, *by* Rachel Floersheim, *1962, 162 pp. Hebrew and 41 pp. English summary chapter*

Financial intermediaries in Israel during 1950–54 developed rapidly as is evidenced by the increase in the level of their total assets from IL 293 million in 1950 to IL1,021 million in 1954, or at an annual rate of 37 per cent. The economic framework of Israel during that period was conducive to the expansion of financial intermediaries, but provided also for the restraints on the growth of financial assets. The increase in real GNP at an annual rate of 13 per cent, and the rise in the implicit price index of total resources available to the economy at an annual rate of 31 per cent caused an increase in the demand for funds by borrowers, especially as the real rate of interest was negative in all years except 1954.[1]

These same conditions limited the holding of savings in the form of long-term financial assets fixed in their nominal value. Aside from savings through pension funds, the flow of long-term funds to financial intermediaries from the private sector dwindled because the price-sensitive financial assets, such as common stocks or value-linked bonds, were available only in limited supply. On the other hand, the central government channeled through financial intermediaries nearly one-fifth of the Development Budget expenditures that were made available to the nonfinancial economy. Thus,

1 The nominal rate of interest, which was fixed at a maximum of 9 per cent a year, has been supplemented since 1952 by a free market rate. This rate was estimated to have reached a maximum of 24 per cent a year. As the year-to-year change in the implicit price level was larger than the free market interest rate for the same year, the real interest rate was negative. This was the case from 1951 to 1953.

non-bank financial intermediaries other than pension funds ceased to channel private savings into investment outlets; instead they became Government agents transferring funds from the public sector to the private sector. The restraint on the growth of financial intermediaries is reflected in the rate of growth of their assets at constant prices. This was only 5 per cent per year, i.e., substantially smaller than the rate of growth of real GNP.

The development of all financial intermediaries taken together is closely connected with changes in the relative position of their components or types. Commercial banks were the most important type of financial intermediaries, but their importance declined, partly due to the restrictions imposed on them through the monetary policy implemented by the controller of the banks. Pension funds expanded rapidly because of the rise in the employees' money incomes, of which a constant percentage was allocated to pension funds, and because of the increase in the labor force. The finance companies of the public sector experienced the most rapid rate of growth, as they were primarily agents which channeled to the private sector funds received from the Government's Development Budget. Assets of mortgage companies or mortgage banks did not grow faster than the average growth rate of all financial intermediaries, but if it were not for funds they obtained from the Government's Development Budget they would not have been able to grant mortgage loans at low interest rates, because the continous inflation made it impossible for them to obtain funds by selling bonds to the private sector. Thus the private financial intermediaries, which were established with the intention of mobilizing personal savings as their source of funds, to be lent to the non-financial sector, were not able to fulfill this function because personal savings in this form were no longer available, and they had gradually become agents for channeling funds originating in the public and semi-public sectors.

16. DIRECT EXPORT PREMIUMS IN ISRAEL: 1952–1958, *by* David Pines, *1963, 144 pp. (Hebrew)*[1]

During the whole of the period 1952–58 a disguised process of depreciation took place in Israel. Not only were the formal buying and selling rates for foreign currency gradually increased, but the depreciation was further stimulated by a less apparent process. Fiscal and administrative restrictions were imposed on imports, thus raising the effective import

1 English summary issued as Research Paper 16.

rate, while various schemes of premiums were granted for exports, raising the effective buying rates. The inevitable result was a complicated multiple exchange-rate system.

It appears that the use of a disguised process was mainly intended to prevent undesirable side effects which were feared would accompany an overall open depreciation. However, fiscal and other less important motives undoubtedly played a role as well.

The multiple exchange-rate system, whether implemented in order to disguise the depreciation process or motivated by fiscal considerations, led to waste of resources. Two types of rate differentials for exports were liable to cause a misallocation of resources:

1. Vertical differentials, i.e. rates applied to the import component of exports, which differed from the rates applied to export proceeds.
2. Horizontal differentials, i.e. variable rates applied to export proceeds, differing on the basis of items exported, currency received, country of destination, or some other export attribute.

The authorities were aware of the misallocation inherent in the rate structure. They consistently attempted to overcome the undesirable implication of vertical differentials by improving the premium schemes and the administrative technique. These efforts were apparently demonstrated by the scheme of granting premiums to net added value, which gradually became the most widespread premium system since the beginning of 1956. However, the deficiencies of this scheme indicated that administrative intervention was an inferior substitute for a unitary and automatic rate system.

It appears that the potential distortional effects of horizontal differentials were also not entirely ignored. Yet in this respect policy was much less consistent, because of fiscal and other considerations. When administrative regulations were introduced to prevent waste of resources, the poor result indicated again that administrative arrangements could not take the place of a uniform exchange rate in achieving an optimum allocation of resources.

17. BANKING INSTITUTIONS IN ISRAEL: 1950–1961, *by* Meir Heth, *1963, 279 pp. (Hebrew)*[1]

This study deals with the structure of the banking system — number, size, branching and scope of business of commercial banks and credit co-

1 English edition in preparation.

operative societies — and with the activities of banking institutions as reflected in the composition of their assets and liabilities, as well as in their profit and loss accounts.

The major changes in the structure of Israel's banking system during the period covered by the study were that the number of banking institutions declined as a result of the elimination of about four-fifths of the credit cooperative societies. The number of banking offices increased, however, as a consequence of the branching of commercial banks, mainly the "big three." Moreover, the declining number of independent institutions and the branching process led to an increased concentration of the banking business in the hands of few big commercial banks.

In addition, the pressure of increasing liquidity ratios, and the growing need of the developing economy for financial services, encouraged commercial banks to engage in branches of business that are outside the scope of banking proper (i.e. receiving demand deposits and granting loans).

The composition of assets and liabilities changed in response to the inflationary pressures and the counter-measures employed in the form of liquidity and credit regulation. The importance of both demand and regular time deposits declined, whereas Government and other institutional deposits assumed much bigger proportions. Liquid assets held exceeded the needs of banking management, and available resources were used mainly for short-term credit. Other types of credit were granted mainly out of Government and institutional deposits.

Lastly, the profitability of banking institutions declined considerably in the years 1950–58. In later years profits gradually recovered, as the banking institutions adapted their activities to the circumstances of tight monetary regulation.

18. CONSUMPTION PATTERNS IN ISRAEL, *by* Nissan Liviatan, *1964, x + 88 pp. (Hebrew and English)*

The statistical material on which this study is based is mainly the Family Expenditure Survey 1956/57, which included about 6,500 Jewish wage-earning families living in cities of over 10,000 inhabitants.

The consumption patterns in Israel are basically similar to those known from budget studies carried out abroad. Food items are inelastic with respect to income (i.e. the percentage change in the expenditures on these commodities is smaller than the percentage change in income), while non-food items are usually income-elastic. For commodities with income elasti-

city of less than unity (such as food items) an increase in family size tends to raise expenditures (when income is constant), while the opposite is true for income-elastic commodities. However, the simple form of the *per capita* approach cannot explain other features of the empirical consumption elasticities. In particular, consumption expenditures (*per capita*) tend to vary with changes in family size even when income *per capita* is kept constant. This can be attributed to the existence of "economies of scale" in consumption.

The analysis by continent of origin shows that while there are no differences between the continent groups in their expenditures on "total food" there are very significant differences with respect to expenditures on all the major food components (except fruit). Other things being equal, European immigrants spend 30 per cent less on bread and cereals, 15 per cent less on vegetables and 10 per cent less on fats than the Asian immigrants. There is a considerable degree of uniformity within each continent as compared with the differences between continents, except for the differences between Yemenite and other Asian immigrants.

The pattern of differences between continents continues to hold both for newcomers and veterans. With regard to those commodities where the differences between "continents" are most marked, we found a reduction in differences over time for bread and cereals, milk, and meat, while in the case of vegetables and eggs we found no tendency towards increasing uniformity in consumption levels. In the case of non-food items the differences between continents are even more marked than with food items. One of the main differences is that expenditures on cultural needs are much higher (other things being held constant) in the European groups of immigrants. This pattern of differences is undoubtedly due to a large extent to the higher educational level of the European immigrants.

European immigrants spend less than Asian immigrants on clothing and footwear. It is not unreasonable to interpret the high levels of spending on clothing by the Asian immigrants as a kind of "conspicuous consumption" which is a psychological reaction to their lower status in Israel society.

Asian immigrants tend in fact to change their expenditure patterns in the direction of European standards. However, the European immigrants tend to change their non-food consumption patterns in precisely the same direction as the Asian immigrants. The net result of this process is that quite often the gap between the continents does not diminish and may even increase (as in the case of expenditures on education). It seems therefore that the basic differences between immigrants in non-food consumption are here to stay for a long time.

19. LONG-TERM PROJECTIONS OF SUPPLY AND DEMAND FOR AGRICULTURAL PRODUCTS IN ISRAEL, *by* Yair Mundlak and Others, 1964: *Volume I,* GENERAL VIEW AND SUMMARY, *by* Yair Mundlak, *xv + 224 pp. (Hebrew and English); Volume II,* BRANCH STUDIES[1], *offset (Hebrew) and mimeographed, 703 pp. (English)*

This research was financed in part by the United States Department of Agriculture and was conducted in cooperation with the Department of Agricultural Economics of the Hebrew University. A study was made for each of the major branches of Israel agriculture. The results are published in two volumes: *General View and Summary* by Dr. Mundlak, and more detailed *Branch Studies*[1] by members of the research team. Professor Sidney Hoos of the University of California served as adviser to the team.

General View and Summary contains a comprehensive review of past trends in agricultural production and consumption of agricultural products in Israel, as well as Dr. Mundlak's conclusions with respect to the implications of the findings of the study for agricultural policy in Israel. This volume includes estimates of growth of population and *per capita* income by Nadav Halevi.

One of the more interesting findings of the study is that the annual rate of growth of agricultural production will decrease from about 14 per cent realized in the period 1949–61 to about 5–6 per cent in the period 1965–75. The lower rate of expansion is attributable to two major limitations: (1) there will be no significant increase in the amount of water and land; (2) this implies that further expansion in production will have to take place by increasing production of products which require intensive application of labor and capital. Such expansion will have to adjust to changes in demand for the products in question.

Part of the growth in production is expected to be the result of increased productivity. In the period 1952–61 the annual rate of increase in production which is attributed to increase in productivity was 5.3–5.7 per cent. A lower rate is postulated for the future. However, it is pointed out that this rate could be affected by the policy adopted towards increasing productivity.

[1] "The Demand for Wheat," by Tuvia Blumenthal; "Demand Projections for Edible Oils and Their Raw Materials," by Tuvia Blumenthal; "A Forecast of Meat Consumption and the Demand for Milk Products," by Tuvia Blumenthal; "Cotton," by David Braude; "Vegetables," by Shaul Ben David; "The Supply and Demand for Summer Fruits," by Uzi Goldenberg; "Tobacco," by Mark Wilsker; "The Poultry Industry," by Eitan Hochman; "Trends in Cattle Raising," by Yoav Kislev; "The Field Crops Industry," by Dan Yaron; "Supply and Demand for Citrus," by David Levhari.

On the policy side, it is claimed that agriculture in Israel can function efficiently without Government intervention, and it is therefore suggested that the policy of intervention in agriculture can be largely dispensed with, not only on the basis of general principles but also because this is feasible in practice.

20. THE PUBLIC, HISTADRUT, AND PRIVATE SECTORS IN THE ISRAELI ECONOMY, *by* Haim Barkai, *1964, 87 pp. (Hebrew and English)*[1]

The study shows that the public and Histadrut[2] sectors each produce about 20 per cent of the national product, while the private sector produces just under 60 per cent. These figures illustrate the special characteristic of the Israel economy: the private sector plays a comparatively small role. No great change has occurred in recent years in the relative importance of the sectors, although a decline in the importance of the private sector can be discerned. From 1953 to 1960 the share of the public sector in the national product rose from 19.4 to 21.1 per cent. The Histadrut's share in the same period was practically constant at 20.4 per cent, while the private sector's share dropped from 60.3 to 58.5 per cent. In 1959 the private sector produced about three-quarters of the net product derived from manufacturing and about two-thirds of the net product from agriculture, while the Histadrut sector produced more than a fifth of the net product from manufacturing and a third of the net product from agriculture. The share of companies in the public sector rose continuously from a fifth in 1953 to over a quarter in 1960. This change represents a significant shift in the standing of components within the public sector.

A very interesting feature observed in the data is the change which took place in the industrial structure of *kibbutz* settlements. As early as 1959 the share of manufacturing in the net product of *kibbutz* settlements was equal to the share of agriculture.

In order to estimate the share of the public sector in economic activity, the author defines six indicators or measures: employment and share in product which reflect production; product by final use, consumption, and investment — three measures of demand; and finally, investment financing. While the public sector produces about a fifth of the national product, it purchases over a quarter of the resources of the economy, which is more

[1] Published as Part I of the FP *Sixth Report.*

[2] General Federation of Jewish Labor, in itself a large owner of firms.

than a third of the national product. The other measures show that public consumption is over a fifth of consumption in the economy, while public investment is about a half of all investment. The investment financing measure is even higher and shows that at least 55 per cent of investment is financed from public sources.

The author attempts to evaluate the status of the public sector by using international comparisons. He compares production and demand measures in Israel and eleven other non-Soviet countries, including Pakistan and India on the one hand, and Great Britain, Sweden and the United States on the other. The author shows the existence of at least two factors which affect the size of public sector activity: the level of economic development, measured by *per capita* product, and the dominant political ideology. Since *per capita* product in Israel is lower than in Great Britain and Sweden, the demand measures indicate that the welfare state policies in fact implemented in Israel are even greater than in the classical welfare state countries. The production measures indicate that in Israel the socialistic elements are particularly important. This conclusion may be reached without reference to the Histadrut sector. When the latter is taken into account, the conclusion holds *a fortiori*.

21. AN ECONOMIC ANALYSIS OF ESTABLISHED FAMILY FARMS IN ISRAEL: 1953–1958, *by* Yair Mundlak, *with an* APPENDIX *by* Gershon Kaddar, *1964, xv + 172 pp. (Hebrew and English)*

In this study Dr. Mundlak drew upon data gathered by a team of investigators on 75 farms in six villages during the period of the study. The team was originally led by Mr. G. Kaddar of Bank Leumi; in 1956 the survey was taken over by the Ministry of Agriculture and was directed by Dr. Y. Lowe.[1] The aim of the survey was to investigate the input-output relationships of the various types of farms.

Israel agriculture has had outstandingly high rates of growth, in part because many new settlements were established after the foundation of the State. This study showed that the contribution of established family farms to the increase in agricultural product was considerable; in 1954–58 production in the sample farms rose by 52 per cent (at fixed prices), while the total agricultural product (including the contribution of new farms)

[1] Other members of the team were Messrs. M. Noam, T. Gans, E. Heiman, Y. Remer, M. Zohar, and M. DeVries.

rose by 66 per cent. The rise in product of established farms was chiefly the result of increased capital inputs and higher labor productivity. In the period under review the capital invested in structures and equipment on the farms doubled, while the amount of labor input decreased slightly. The share of the various inputs in production is estimated from a production function. From these estimates it appears that the differences in amounts of irrigated land held by the different farms was not associated with differences in production; the marginal productivity of irrigated land was very low. This is explained by the fact that the sample farms concentrated on livestock production, as such branches provided a fair return to productive factors. Transferring factors of production from livestock to crop branches, a necessary step for increasing the marginal productivity of land, would not have increased the total output of the farms significantly.

Concentration on livestock production did not characterize newly established settlements. Furthermore, the market is not big enough to allow all farms to concentrate on livestock. Dr. Mundlak concluded that in order to enable farms engaged in crop production to earn the same incomes as those concentrating on livestock, it was necessary to raise the relative price of field crops; this could be achieved by altering the rate of exchange. Further, the farms had to be allowed to expand their areas, so that more efficient mechanization methods could be used and so as to enable the productive factors released as a result of technical progress to be utilized.

The author's conclusions are based on the assumption that farmers react to changes in prices of final products and productive factors. This assumption was examined and validated empirically by use of a supply function for poultry products and a demand function for various productive assets. The author's conclusions are also based on the assumption that there are differences in efficiency among farms. These differences were measured from the data by defining a "management" variable. It was found that the most efficient farm produced over 58 per cent more than the least efficient farm using similar inputs. These differences in efficiency are also reflected in the size of the farms and their net incomes. The analysis revealed that half of the differences in net incomes is the result of differences in efficiency. The other half is the result of random factors, price variations and differences in the behavior of the farms.

Five appendices give the basic data in full and explain the computations, while in his *Appendix* Mr. Kaddar describes the field survey from the choice of the sample until the later stages when the investigators became acquainted with the farms and assisted them with advice.

22. ISRAEL'S TERMS OF TRADE UNDER ITS CLEARING AGREEMENTS, *by* Avraham Kessler, *in press* (*Hebrew*)

The study considers Israel's bilateral clearing agreement program during 1949–60 with special reference to the relative levels of import and export prices of commodities traded within the framework of the agreements.

The development of the program is considered against the changing international balance of payments situation during the late forties and early fifties. The characteristics of Israel's clearing agreement are classified and described. Data on the development of the agreements are shown and important trends are pointed out. It is noted that, unlike the experience in West Europe after World War II, the absolute magitude of Israel's clearing agreements did not loom large in the overall balance of payments.

In analyzing the various advantages and disadvantages of Israel's clearing agreement program, a distinction is made between short-term and long-term effect. Many supposed advantages of clearing agreements, other than those having to do with export encouragement, were not too important for Israel. Many of them (the forcing of "luxury" exports, providing an "incubator" for the training of exporters, drawing foreign investment) carry the danger of short-term success at the expense of a distorted production structure within the economy. Likewise, some of the cited disadvantages (e.g., high cost and price levels engendered by bilateral trading) are tempered by the short-term gains Israel seems to have received from favorable cross-section terms of trade. It is concluded that the proper appraisal of the clearing agreement program must rest on the advantages it provided in helping Israel to maintain and expand its exports, and on the disadvantages entailed in a distorted price and resource allocation pattern. Such appraisal is made difficult by the concurrent working of various schemes for the encouragement of exports, and the existence of many factors making for price distortion and resource misallocation in the Israel economy.

The core of the study is concerned with the measurement of the cross-section terms of trade which show the relative level of divergence of import and export prices obtaining under the clearing agreements from the prevailing international prices. The calculation of the cross-section terms of trade is based on detailed studies of the commodities traded under the various agreements. The large amount of work entailed in these studies confined the calculation of the cross-section terms of trade to one year only, 1953. Some of the possible underlying reasons for Israel's favorable cross-section terms of trade in 1953 were explored, with some of the arguments going beyond the specific conditions existing in 1953. The discussion is

centered on the composition of Israel's clearing trade, the state of balance in the payments accounts, the foreign exchange control provisions relating to exports, and administrative reasons. The limitations of the results are noted and problems of measurements are discussed in detail.

The commodity studies are presented in a separate appendix, while six appendices to the text of the study give a detailed tabulation of the provisions of the agreements, summaries of payments made through the clearing accounts, and other relevant data.

23. THE EFFECT OF MASS IMMIGRATION ON WAGES: ISRAEL, 1948–1958, *by* Uri Bahral, *in press* (*Hebrew and English*)

This study deals with the effect of mass immigration and absorption of immigrants in employment on the wage level, the wage structure and the wage policy of labor market institutions in Israel during 1948–58.

Chapter I summarizes the problems of wage determination under centralized collective bargaining in Israel in the period of immigration, and presents the main conclusions and findings of the whole study.

The analytical framework of the study is given in Chapter II. An attempt is made to formulate the expected changes in wage level, wage structure and wage policy under conditions of mass immigration. The basic assumptions of the analytical framework are examined in the light of the available data.

Wage level developments are analyzed in Chapter III. It is shown that while industrial real wages (from the workers' point of view) increased during Israel's first decade, this rising trend weakened considerably and perhaps even stopped altogether in the years of mass immigration. On the other hand, labor prices from the employers' point of view (industrial wages deflated by capital prices) decreased considerably after the years of mass immigration.

Wage structure changes are investigated in Chapter IV. According to the available data, relative wage differentials in industry widened during the decade, particularly at the beginning of the mass immigration period. Similar trends were found for wages of some non-industrial workers.

Wage policy adjustments are analyzed in Chapter V. It is shown that, in contrast to the accepted view, cost-of living allowances widened relative wage differentials during immigration years. Other "social" allowances, supported by labor market institutions, also worked in the same direction. Relative wage differentials were widened towards the end of Israel's first decade by changes in the basic rates as well.

The data used in the course of the study relate mainly to the industrial sector of the economy. In the absence of additional time-series wage data for other sectors, it is impossible to extend the conclusion of the study to the economy as a whole. However, since the industrial labor market is one of the most institutionalized and centralized markets in the economy, some of the empirical results of the study are of particular importance for the general problem of wage determination under conditions of mass immigration.

24. The Arab Labor Force in Israel, *by* Yoram Ben-Porath[1]

The Arab population and the Arab labor force constitute a distinct group, not only ethnically but by their economic characteristics as well. The purpose of this work is to discuss some of these characteristics and to examine the relationships between the Arab labor force and the dual labor market which it faces — the Arab and the Jewish sector.

In comparing the Arab and the Jewish populations by various socio-economic variables, what emerges, in addition to the difference between the Arabs and the Jews taken as a whole, is the existence of a more or less fixed scale, with the Arabs at the bottom, followed by the Jews from Asia and Africa (first the new immigrants among them and then the veterans), and finally the other Jews. This ranking exists both for factors which may be considered exogenous to the economic system, such as demographic characteristics and educational level, and variables endogenous to it, such as unemployment and income levels.

The quality and quantity of the supply of labor generated by the Arab population is very much affected by its age structure, which results in a relatively small proportion of earners to population and in a relatively young labor force. The main qualitative factor, but one which is not devoid of quantitative implication, is the level of education. The ranking just mentioned is observed in the age structure and in the level of education on the one hand, and in the age specific rates of labor force participation and in rates of unemployment on the other.

The overall industrial and occupational structure of Arab employment differs from that of the Jews in its very low percentage of white collar workers and its very high percentage of workers in agriculture and in construction. While among the Jews, especially the immigrants from Asia and

[1] Manuscript being revised.

Africa, one observes a tendency to leave these branches, no such trend is observed among the Arabs. There seems to be a specialization of Arabs in manual jobs.

The employment opportunities open to the Arab labor force have been either in the Arab sector or in the Jewish sector. The discussion of the Arab sector is limited to agriculture. Owing to the fact that employment in agriculture depends mainly on the availability of land and water, the author argues that Arab agriculture can provide employment only for a small and declining percentage of the Arab rural labor force. One factor which contributed to this result was the expropriation of land in the early years of the State. Of greater importance is the rapid natural increase of the Arab population, which is among the highest in the world (even at the end of the mandatory period the situation was not too good in this respect). The non-agricultural opportunities in the Arab sector were not explored, but there is no doubt that these could not be appreciable; the employment situation of the Arabs thus depended critically on access to the general labor market.

Even in the mandatory period there was some employment of Arabs outside their own sector, but since the establishment of the State the incentives for this have increased. Most of the Arab population lives in separate Arab settlements, predominantly in villages, and therefore employment in the Jewish sector also means employment in a different locality. The Jewish labor market which, especially in the first years of the State, experienced a labor surplus resulting from mass immigration tried to protect itself by various institutional arrangements. One of the main factors which restricted Arab entry into the Jewish market was the need for travel permits which were issued and regulated by the military authorities. Over the years the impediments to Arab mobility have been reduced and almost eliminated. The situation in the general labor market has improved and the percentage of Arab workers employed in the Jewish sector has increased, with a corresponding reduction in wage differentials between Jews and Arabs. According to the estimate of the Census of Population, 1961, about half of Arab employment is in the Jewish sector, mainly in agriculture and construction. Regression analysis shows that the mobility of the rural Arab labor force depends mainly on the availability of land and water in the village, and very likely on the proximity of the Jewish labor market.

The level of income of the Arabs still is very much lower than that of the Jews, and the rate of unemployment still is higher. But there are indications of a very rapid rise in income of Arabs over the years and some narrowing of the gap between them and the Jews. This is certainly associated

with the rise in mobility. Yet we tend to interpret the developments of the past few years as an approach to equilibrium, as a result of the very process of the normalization of the economic relations between Jews and Arabs and of the elimination of barriers to their ties. There are therefore no grounds for extrapolating their developments into the future, once this normalization is completed. A certain gap in income results from the difference in the levels of education and from the rural form of settlement. These, assisted perhaps by some forms of discrimination, determine the special structure of employment and its income implications. The author feels that a process of residential integration (to which, by the way, there is no official opposition) could be a force which would bring about a greater similarity and a narrower gap between the two groups of the Israel population.

A revision of the manuscript is now nearing completion.

25. THE PROFITABILITY OF INVESTMENT IN EDUCATION IN ISRAEL, *by* Ruth Klinov-Malul.[1]

The main purpose of the study is to measure the profitability of investment in education by comparing expenditures on acquiring each level of education with the differential income due to the additional education.

The measurements are based on cross-section data for 1957/58, obtained from the Survey of Family Savings 1957/58, and from a sample of income tax files for four liberal professions — engineering, medicine, law and auditing.

In carrying out these computations a distinction was made between the viewpoint of the individual and that of the economy as a whole. Although many differences resulting from these two viewpoints should have been measured, only two components of the calculation were actually measured in two forms. On the income side, incomes were measured net of direct taxes for the individual's computation, and gross for the economy's calculation. On the expenditure side, direct costs for individuals were measured gross of subsidies, while those of the economy were measured net of subsidies.

It was found that elementary education was highly profitable to the economy as well as to the individual, to such an extent that it would be worthwhile for a man up to the age of 35 to cease working for two years in order to complete his education. Uncompleted post-primary education

[1] Manuscript being reviewed.

was not profitable to individuals or to the economy. The loss was least for new immigrants from Asia and Africa. Similarly, full secondary education was not profitable, but the loss could be offset by the individual's continuing with university education. This perhaps explains why about 90 per cent of boys and 80 per cent of girls who matriculate go on to higher education.

On an average, higher education was profitable from the individual's viewpoint. However, when the cost to the economy was calculated, it was found that investment was not profitable in certain fields of higher education.

The main explanation offered for the apparent loss is that there existed a large "stock" of secondary and higher education graduates relative to tangible capital at the beginning of the fifties. The rapid increase in tangible capital since then is, however, presumed to have increased the profitability of investment in secondary and higher education.

26. THE STRUCTURE OF ISRAEL MANUFACTURING INDUSTRIES, *by* Ephraim Kleiman[1]

In this study an attempt is made to describe and analyze some of the structural characteristics of Israel manufacturing industries in the fifties. It is based mainly on cross-section analyses for 1955 and 1958, augmented by time-series comparisons covering both earlier and later periods. The following summary follows roughly the study's chapter headings.

(a) The relative importance of manufacturing in the economy. This is measured by its share of either the GNP or of employment, and the causes underlying changes in it are traced over the years. An international comparison shows the importance of manufacturing in Israel to be somewhat lower than might have been expected in view of the level of *per capita* income.

(b) An investigation of the industry structure of Israel manufacturing shows a high preponderance of food industries. Though their weight has been decreasing with time, it is still rather high. A comparison with Western Europe and the United States shows this to be typical of a certain stage of economic development and industrialization. It is also seen that the present industry structure is to a certain extent the product of the different general economic conditions which existed in various periods in the past. Other inquiries in this sphere reveal the connection between form of ownership

[1] Manuscript being reviewed.

and industrial branch, and show that the trend towards incorporation in manufacturing levelled off some years ago.

(c) The size structure of Israel manufacturing seems to indicate the relative lack of large-scale activities. While there has been a trend towards an increase in the size of plants, the size structure is still rather small when compared with more highly industrialized economies. The correlation of size and age of plants suggests that a considerable part of industrial growth is in the form of expansion of existing plants rather than the establishment of new ones. This tendency, combined with the size of the markets (of which it is in itself a product), resulted in the highly oligopolistic structure of many industries.

(d) The value added per person engaged in manufacturing seems to be determined principally by the size of plant, though the type of industrial activity also plays a part. The development of the share of value added in output over a period of 30 years raises some questions regarding the "deepening" of production.

(e) Labor payments per employee, even more than the average value added, seem to depend on the size of plant. Various alternative explanations of this tendency were investigated which would comply both with this relationship and with certain types of behavior observed in the labor market. Also examined were the differentials among industries in the share of labor payments in the value of output. Thus, a certain connection seems discernible between the level of the labor-cost component and the stage of fabrication. On the other hand, this component seems to be affected by the "price" of labor — which suggests a certain elasticity of substitution between labor and other factors of production. These findings are supplemented by international comparisons of the labor-cost component, indicating, on the whole, the existence of a connection between the level of the component and the stage of economic development. In light of this, the Israel components seem rather high, though there are indications that this is a result of some administrative overhead rather than of the price of labor itself.

(f) The regional structure of manufacturing reflects the conditions under which these industries developed. In particular, the relative degree of industrialization of the main urban centers seems to have increased during the fifties, which raises the question of the efficacy of Government policy in this respect. Also analyzed were the reasons underlying the tendencies of some industries to concentrate in certain geographical areas.

(g) The investigation of profits in manufacturing has rather limited meaning, as little is known of capital invested and, consequently, of profitability. Nevertheless, some impressions can be gathered from the description of both inter-industry differentials and changes over time. The latter, in particular, reveal the effects on profits of the period of direct controls effective at the beginning of the past decade, and of its deterioration.

(h) The specialization of manufacturing industries with respect to international trade was examined and found to be rather low, both in absolute terms and relative to some other selected countries. Thus in the fifties there were hardly any industries which could have been said to depend considerably on foreign markets.

27. Saving and Investment Through Provident, Pension and Social Insurance Funds: 1952–1961, *by* Marshall Sarnat[1]

This work constitutes an extension of the Falk Project's research into the financial operations and economic impact of retirement funds in Israel. The study commences on the eve of one major devaluation of the Israel pound (February 1952), which was followed by the introduction of a "New Economic Policy" and a rapid rise in wages and prices; it closes on the eve of yet another devaluation, which was followed by an increase, albeit much more moderate, in both wages and prices. This period opened in an atmosphere of comparative freedom of action, marked by only a modicum of Government intervention and supervision; but following the introduction of special tax regulations in the summer of 1957, the further development of the funds was conditioned and closely regulated by public authority.

During the whole period, retirement fund membership more than doubled, reaching a total of 377,000 at the close of 1961. This rapid growth in membership was not accompanied (as one might have expected) by a parallel expansion in the number of active retirement funds. On the contrary, the number of funds fell from 450 in 1952 to 400 in 1961. This contraction in the number of funds during a period of rapidly expanding membership largely reflects the amalgamation of numerous provident funds previously affiliated with individual enterprises into large central pension funds; the major turning point in this development was the establishment of the "Histadrut Central Pension Fund" in 1954.

By the end of 1961, employee retirement funds embraced 69 per cent of Israel's wage and salary earners, and if we eliminate Government employees and primary school teachers, who are covered by direct budgetary pension schemes, the proportion of wage earners covered by some form of funded

[1] Manuscript being reviewed.

retirement benefit program rises to over 80 per cent. With regard to the self-employed, however, the picture was materially different. Commencing in 1957, provident funds for the self-employed were gradually introduced, and 14 such funds, embracing 26,000 members, were in operation by the close of 1961. Together with the members of cooperatives, approximately 14 per cent of the self-employed were covered by funded retirement plans in 1961.

The funds' total assets increased fourfold between 1952 and 1957, rising from IL50 million to IL266 million; assets doubled again between 1957 and 1961. By the end of the latter year the total assets of retirement funds reached IL630 million, which represents a more than twelvefold increase over the entire nine-year period.

During the period under study, retirement funds emerged as the prime source of institutional savings in the economy and as a factor of paramount importance in Israel's capital market. The transition from lump-sum to pension benefits (which is still under way), combined with the far-reaching changes in the structure of the capital market which have taken place since 1959, raises serious problems for the funds' managements and for the regulatory authorities. In the final report the investment experience of the past decade is analyzed in order to provide benchmarks for the evaluation of the funds' economic performance and for the formulation of public policy in the future.

28. THE FOREIGN EXCHANGE RATE SYSTEM AND THE EFFECTIVE RATE IN ISRAEL: 1949–1961, *by* Michael Michaely[1]

This project, which covers the period from the inception of the State of Israel to the latest devaluation of the Israel pound (announced on February 9, 1962), is divided into two essentially separate parts. The first consists of collection and processing of the data (now approaching completion) and of a description of the foreign-exchange system and its development (to be completed in the coming year).

The second part of the project is to consist of a series of studies, primarily of an analytical nature, which will utilize the findings of the first part. A few subjects which suggest themselves are: the extent of and reasons for variations among rates of exchange; the selection of alternative components of the exchange-rate system; the effect of the foreign-exchange system on

[1] In preparation.

the distribution of income and on the Government budget; the extent of import restrictions and of their replacement by discriminatory pricing systems; exchange rates and domestic prices; the effect of variations in foreign-exchange rates on the export of individual goods and on the balance of payments; and possible distortions of the allocation of resources introduced by the foreign-exchange system. It is expected that each of these subjects will be undertaken as a separate study, primarily in the form of M.A. dissertations at the Hebrew University.

This project has been undertaken in cooperation with the Research Seminar in Economics at the Hebrew University, for which financial help is being provided mainly by the Bank of Israel, and also by Bank Leumi le-Israel and Bank Hapoalim. The study incorporates the findings of a considerable number of seminar papers. During the academic year 1961/62 four of the Seminar's participants — Shaul Berger, Yigal Cohen, Menahem Firt, and Michael Fisher — acted as research assistants; Yosef Baruch, of the Bank of Israel, also took part in conducting the work. Since the fall of 1962, Benjamin Shidlovsky has participated in the project as a research assistant.

29. ISRAEL'S TARIFF STRUCTURE AND FUNCTIONS, *by* Arnon Gafni, Nadav Halevi and Giora Hanoch, *Research Paper 3, 1958, 35 pp. Hebrew and 4 pp. English summary*

This study examined and analyzed some aspects of the Israel tariff. Its primary purpose was to present a method of classification and analysis of tariff functions which may be of use for evaluating tariff policy. This method was mainly concerned with the functions of tariffs within a framework of quantitative restrictions on imports. The functional classification of tariffs, as presented by the study, was designed to emphasize the fact that a given tariff can have several effects, not all of which are intended by the tariff policymaker. Understanding of this fact may constitute an important first step towards rational tariff policy. The term "rational tariff policy" refers to the situation where tariffs have only the effects desired and foreseen.

This method of analysis was used to describe certain aspects of the structure and operation of the Israel tariff as it was in the 1955/56 fiscal year.

The study concludes that as a first step to understanding tariffs and duties, the revenue, import-diminishing and protective effects must be differentiated. The effects of a tariff can change when other controls on imports are altered. For instance, if a quota is placed on the import of an item, a protective

tariff can no longer serve its function. Quantitative restrictions can give rise to monopolistic profits to the possessors of import licences. These profits can be absorbed by a tariff, without causing a rise in price.

In Israel much of the information necessary for formulating a rational tariff policy was lacking. There was a trend towards greater use of tariffs instead of quantitative restrictions for import control. In many cases where products were both imported and produced domestically, purchase taxes are preferable to tariffs, because they supplied revenue without granting protection to local industry, and because they decrease consumption at the expense of imports.

Israel customs authorities have wide powers in determining dutiable value of imports. These rights have not been exploited to any extent. Specific as opposed to *ad valorem* duties seem to be used in practice, in order to disguise the height of the tariff and to ease the administrative burden.

30. Productivity of Labor and Machines in Israel's Cotton Spinning Mills, *by* Ruth Klinov-Malul, *Research Paper 4, 1958, 48 pp. (Hebrew and English)*[1]

The purpose of this paper is to examine why the prices of Israel's cotton yarns are higher by about 150 per cent than those of European and American yarns.[2] Two explanations were examined: first, that physical productivity was relatively low; and, second, that prices of factors of production were relatively high.

Comparisons of physical productivity show that rings (which are the key machines in spinning mills) are employed at 70 per cent of their maximum engineering potential. This level of efficiency represents the combined effect of production per machine-hour (which is about 83 per cent of the engineering standard) and of the number of machine-hours during a month (which is 85 per cent of the standard). Labor consumption for a standard product-unit is higher by two to three times than that of the United States, but similar to that of European and South American countries.

There are three main reasons for low physical productivity. First, the small scale of plants (all except one of which have less than 20,000 spindles), which prevents efficient use of modern machinery and of maintenance,

[1] Translated and reprinted from the *Economic Quarterly* (Hebrew), V (April 1958).
[2] This paper was written in 1956, when the official exchange rate was IL 1.80 = $1.

research, quality control, and management service techniques. The second reason for low physical productivity is the diversity of products, which causes frequent machine-stoppages and lack of coordination among the various phases of production. Thirdly, there is a shortage of skilled workers, especially machine operators.

The total effect of the lower physical productivity on prices was examined by computing hypothetical prices of Ata[1] yarns, on the assumption that Ata pays the factors of production prices equal to those they receive in England, Italy and Germany; these hypothetical prices were then compared with the actual yarn prices in these countries. Such a comparison showed that the difference in prices between Ata and plants in those countries owing to differences in physical productivity is very small. The main difference in yarn prices is due to higher prices paid to factors of production, especially local ones.

This conclusion can be reformulated by stating that the effective exchange rate of the local value added is higher than the official rate. The effective rate was estimated to be IL3.2 per dollar.

Since 1955 an expansion has taken place both in the number of spinning mills and in cotton-growing areas. Such an expansion is thought to weaken Israel's competitiveness for two reasons: physical productivity in new mills may be lower than that of the established ones, and local cotton may be more expensive than imported cotton.

31. Survey of Family Savings 1957/58 (Preliminary Report), *Research Paper 6, 1959, 26 pp. (Hebrew and English)*[2]

The Survey shows that in the financial year 1957/58 the average saving per "spending unit" amounted to IL170 or about 6 per cent of disposable income. The level of saving differed considerably between individual spending units. Two spending units out of three had some savings (spent on consumption less than their incomes); one unit out of four actually dissaved, and about 10 per cent broke even.

The Survey data showed that among wage and salary earners, three out of four spending units put aside some money in contractual saving schemes. The most common type of contractual saving was in the form of contribu-

[1] One of Israel's most important spinning mills.
[2] Reprinted from *Bank of Israel Bulletin No. 10* (October 1959). Issued jointly with the Central Bureau of Statistics, Bank of Israel, and the Israel Institute of Applied Social Research.

tions to provident funds. Investment in housing was also a major component of saving. Outlays of urban spending units on goods and services, including the investment in real estate, exceeded their incomes.

The average *gross income* of an urban spending unit was IL3,200 in the year of the Survey, and the average *disposable income* amounted to IL 2,800 or 86.5 per cent of the average gross income. There was a wide gap between the incomes of new immigrants and those of veteran residents. Whereas the average gross income in the year of the Survey of persons who immigrated before 1948 was IL 4,100, that of immigrants who arrived in the years 1948–54 was IL 2,600.

32. The Development of Production and Prices in the Vegetable Branch, *by* Y. Divon (Honigbaum), *Research Paper 7, 1960, 11 pp. Hebrew and 2 pp. English summary*[1]

After the establishment of Israel and the departure of the Arab cultivators, the remaining vegetable growers — the study shows — enjoyed a sellers' market, being the only suppliers of the rapidly expanding population. This was followed by a speedy growth of the irrigated area devoted to vegetables, which was cultivated mainly by inexperienced new immigrants — the result being a decrease in productivity in the vegetable branch.

Since the year 1952/53, when vegetable surpluses accumulated in the market for the first time, the area devoted to vegetables has not increased. The production of vegetables, however, continued to grow owing to increasing productivity — causing a decline in vegetable prices as compared with those of other agricultural products.

One of the problems caused by the increase in the production and supply of vegetables is the "Cobweb," a biennial cycle of over-production and shortage. Over-production of some kinds of vegetables in one year, which causes a drop in their market prices, deters the producers from growing them in the following year. The shortage in the second year brings about a rise in prices which again induces over-production in the third year. In order to minimize difficulties caused by this biennial cycle both for producers and consumers, two public bodies were set up in 1952 and in 1957 which established funds for assuring minimum vegetable prices as a means of regulating production.

[1] Reprinted from the *Economic Quarterly* (Hebrew), VII (January 1960), together with an English summary.

The quantitative evaluation of the inter-relationships between prices and output in this study is based on the following data: average annual prices paid to producer, the annual production of vegetables, and total area devoted to them over a year — all calculated for 13 main types of vegetables over a period of nine years (1950–58).

Using these data, the direction of movement of output *per capita* was compared with that of the relevant price. Similarly, the direction of movement of price was compared with the direction of movement in areas planted in the following year. This test provided indices of conformity to the hypothesis that increased production lowers prices in the same year, and that a decline in price decreases production in the following year.

A correlation study of the foregoing data was carried out — thus account could be taken not only of the direction of movement, but also of its extent. The correlations were compared separately for each year for the series of 13 different vegetables.

The conclusion drawn from these examinations is that the extent of price-output inter-relationships in the vegetable branch has remained significant and has not decreased in recent years. This shows that the efforts to regulate vegetable production have not been successful so far.

33. Survey of Family Savings 1957/58 and 1958/59 (Preliminary Report), *Research Paper 8, 1960, 10 pp. (English)*[1]

Both of these surveys indicate that the rate of personal saving in the two-year period ending March 1958 was of the order of 4 to 5 per cent of disposable income. About 60 per cent of families recorded positive savings; the rest either dissaved or broke even. Purchase of durable goods was also around 5 per cent of disposable income. In other words, 90 per cent of families' income went into "current" consumption.

The rate of saving rises as income rises. Dissaving is concentrated in the group with disposable income of under IL 2,000 a year, while saving becomes appreciable when disposable income is above IL 7,500 a year. These results may be biased because families with large temporary losses tend nevertheless to spend on consumption the sum they were accustomed to and consequently to dissave, while families with large temporary income increases tend to save a high proportion of the increase.

[1] Reprinted from *Bank of Israel, Annual Report 1959*, pp. 319–27. Issued jointly with the Central Bureau of Statistics, Bank of Israel, the Israel Institute of Applied Social Research and the Department of Economics of the Hebrew University.

Self-employed persons tend to save more than wage-earners. For example, employers with four or more employees saved 20 per cent of disposable income in each of the survey years. The type of saving is also different. Ninety-seven per cent of the of savings of wage-earners' families consisted of contributions to provident funds and mortgage repayment, while two-thirds of savings of self-employed persons consisted of reinvestment in their businesses.

Saving is closely associated with the age of the head of the household. Between the ages of 35 and 45 of head of family, the rate of saving is highest. A dynamic factor in determination of the level of spending of Israeli consumers is German restitution payments. Up to March 1959 ten per cent of all families had received lump-sum payments from Germany. The average size of such payment was IL 3,680 in 1958/59. The average disposable income of the recipients was IL 4,000, as against IL 3,150 for families who had never received restitution payments. The analysis revealed that 45 per cent of the restitution payments was invested in real estate, 4 per cent was spent on current consumption, 13 per cent was spent on durable consumer goods, and 12 per cent was held in the form of financial assets.

The questionnaire of the March 1958 survey covered some 3,000 urban families. It was modelled on the American and British Savings Surveys, with some modifications to suit conditions peculiar to Israel (e.g. restitution payments from Germany). A follow-up survey of 1,000 of the original families was conducted in March 1959.

34. Empirical Production Function Free of Management Bias, *by* Yair Mundlak, *Research Paper 9, 1961, 13 pp. (English)*[1]

A Cobb-Douglas production function is specified to include a variable which represents the level of management in firm i (Mi):

$$Y_{it} = B_o + B_1 X_{1it} + \ldots + B_k X_{kit} + CM_i + e_{it}$$

where Y is output, $X_1, \ldots, X_k$ are inputs, M is management, e is the disturbance, B_j and C are the true coefficients to be estimated, and i and t represent firm and year respectively.

When the production function is estimated from cross-section data and the management variable is omitted, a specification error is committed and the regression coefficients are likely to be biased. The bias is given a geometrical interpretation.

[1] Reprinted from *Journal of Farm Economics*, XLIII (February 1961).

The management variable is generally omitted from the analysis since it cannot be measured. It is shown that this difficulty can be overcome by applying covariance analysis to data containing more than one observation per firm. Specifically, (1) regression coefficients free of management bias can be obtained, and (2) it is possible to obtain an empirical measure of the management variable and of the elasticity of production with respect to management.

Empirical analysis of data of the sample of family farms in Israel shows that the management bias can be relatively large. The management bias of the various coefficients can be interpreted as coefficients of the auxiliary regression of management on the various inputs. Such regression is evaluated empirically for two samples, one taken in Israel and one abroad.

35. Aggregation Over Time in Distributed Lag Models, *by* Yair Mundlak, *Research Paper 10, 1961, 10 pp. (English)*[1]

This paper surveys some of the problems encountered in the estimation of production and behavioral functions, with major emphasis on the Cobb-Douglas form.

The correspondence between the behavioral equations and the production function is briefly considered in Section 1, which deals with the specification of the model. The problems of estimation are introduced in Section 2, which deals with limitations of single-equation estimation. The possibility of using the reduced form is then considered in Section 3.

This method makes full use of the one-to-one correspondence that exists between the production and the behavioral equations, which are the equations of the reduced form. The limitations of this approach can be overcome by applying more direct methods of estimation.

In Section 4 the Marschak and Andrews case is analyzed, and it is shown how, with the use of a combination of time-series and cross-section data, the system can be identified and solved. This result is considered from various statistical points of view. It is then generalized to the case in which some inputs are and some are not independent of the error terms in the production function. The relation to least squares is explored by comparing the asymptotic standard errors in a case favorable to least squares.

It is found that in this case there is no loss of efficiency in using the

[1] Reprinted from *International Economic Review*, II (May 1961).

suggested procedure. This method of estimation is then further generalized to allow for price variations over firms and over time.

In Section 9 still another approach is considered. It calls for the use of lagged inputs as instrumental variables for eliminating the dependence of current inputs on current disturbances, and the covariance analysis for elimination of firm and time-effects.

Finally, in Section 10, the method of estimation from factor shares is considered, and it is argued that although the method is subject to serious limitations when used by itself, it could be used efficiently together with covariance analysis. We thus suggest three direct methods and one indirect (reduced-form) method for obtaining consistent estimates of the production function.

36. ERRORS IN VARIABLES AND ENGEL CURVE ANALYSIS, *by* Nissan Liviatan, *Research Paper 11, 1961, 27 pp. (English)*[1]

The traditional method of estimating Engel curve parameters uses *either* (recorded) income *or* total expenditure as an independent variable in least squares analysis. Neither of these variables is, however, a satisfactory index of the true economic position of the family. This results in biased estimates of the income elasticities of the various consumption categories.

The following are the main points of this paper:

(a) The common use of total expenditures as an independent variable in the least squares analysis of Engel curves leads to biased estimates of the structural parameters.

(b) Consistent estimates of the parameters of the relation between the systematic parts of total expenditures and its components can be obtained by applying the method of instrumental variables to Engel curve analysis.

(c) The instrumental variable is often available in budget data in the form of recorded household income. It is shown that while this variable is generally unsatisfactory as an independent variable, it still fulfills the requirements of an efficient instrumental variable.

(d) By utilizing budget data from Israel and Britain, empirical estimates of the "least squares bias" are obtained, and it is found that food elasticities are downward-biased while the elasticity of durables is upward-biased. The directions and size of the bias are closely related to the degree of random variability in the different commodities.

[1] Reprinted from *Econometrica*, XXIX (July 1961).

37. TESTS OF THE PERMANENT-INCOME HYPOTHESIS BASED ON A REINTERVIEW SAVINGS SURVEY, *by* Nissan Liviatan, *Research Paper 12, 1963, 38 pp. (English)*[1]

The outline of this article is as follows: In Section 1 the statistical properties of the Permanent-Income Hypothesis that are needed for the subsequent tests are reviewed. This is followed by various attempts to test the Permanent-Income Hypothesis by using external information about the variances of the temporary components.

In Section 2 qualitative information about the importance of errors in observed consumption and income in occupational groups is used to explain the differences in the observed consumption functions of employees and self-employed. In Section 3 Friedman's method of obtaining a quantitative estimate of the variance of temporary income from reinterview data is reviewed and similar tests are performed on the data.

Thus far the results are favorable to the Permanent-Income Hypothesis. In Section 4 an alternative test that requires fewer assumptions than Friedman's method is formulated. This test, which is based on the relation between temporal changes in income and consumption of identical families, contradicts Friedman's model.

Whereas these sections concentrate on testing the Permanent-Income Hypothesis through external information about the error variances, the remainder of the paper concentrates on methods that are supposed to eliminate errors in the observed variables and thus make possible an estimate of the true elasticity.

In Section 5 the principle of elimination of errors, with the aid of additional information, by what is known as the "method of instrumental variables" is considered. This method is then applied to the data by using, in Sections 6 and 8, lagged or future income and consumption as instrumental variables. It is shown that even when the assumptions underlying this method are not completely satisfied, the tests in Sections 6 and 8 can still provide lower and upper limits for the true income elasticity of consumption.

The empirical results show that the upper limit fails systematically to reach the value of unity, which is assumed by the Permanent-Income Hypothesis to be the true value.

[1] Reprinted from *Measurement in Economics: Studies in Mathematical Economics and Econometrics in Memory of Yehuda Grunfeld*, Stanford University Press, 1963.

38. ESTIMATION OF PRODUCTION AND BEHAVIORAL FUNCTIONS FROM A COMBINATION OF CROSS-SECTION AND TIME-SERIES DATA, *by* Yair Mundlak, *Research Paper 13, 1963, 30 pp. (English)*[1]

A model describing behavior of competitive firms consisting of a Cobb-Douglas production function and decision equations (first order conditions) is formulated. It includes variables which represent technical variations among firms (variations in management) and over time (changes in productivity), as well as variations in behavior among firms and over time. Technically the variables mentioned above are referred to as firm and year effects in the production function and in the decision equations, respectively.

The behavioral functions are the reduced form equations of the firm. In obtaining these, the existence of fixed factors is allowed for and the length of run is brought in explicitly.

The explicit formulation of the reduced form shows how demand for factors of production and product supply depend on the firm and year effects in the various equations. Consequently, it is claimed that covariance analysis should be employed in order to secure unbiased estimates of the reduced form equations.

Direct estimation of the production function will generally yield biased estimates since the inputs depend on the firm and year effects as well as on the disturbance of the production function. It is possible to eliminate the firm and year effect by covariance analysis but as shown, not the disturbance proper, even if a recursive decision-making process is postulated.

The extreme case of no variations in the exogenous variables was first investigated by Marschak and Andrews. It is shown how their model can be identified by making the mild assumption of independence between the disturbance of the production function and that in the decision equations. It is shown that the estimates are instrumental variable estimates with the disturbances of the decision equation being the instrumental variables. The method is extended to the case where there are variations in the prices and fixed inputs. The method is also compared with least squares and it turns out that there is no loss in efficiency in using it.

An alternative estimator is also considered. This estimator is built by eliminating the dependence between inputs and the disturbance by using lagged inputs as instrumental variables. This method enables the decomposition of the bias of regular regression estimates of production function

[1] Reprinted from *Measurement in Economics...*, pp. 138–66.

into management and time components and simulatneous equation component.

Finally, possible limitations and modifications of factor share estimator are considered within the framework of this study.

39. WAGE DIFFERENTIALS AND SPECIFICATION BIAS IN ESTIMATES OF RELATIVE LABOR PRICES, *by* Uri Bahral, *Research Paper 14, 1963, 9 pp. (English)*[1]

Dispersion measurements should not be used for estimating changes of wage differentials which are explained by economic factors such as education or immigration. While education (or immigration) is expected to decrease (or increase) wage differentials of a well-defined set of differentials, wage dispersion measurements for any two periods are not averages of the same set of wage differentials. They are averages of entirely different sets of differentials which are determined by the ranking of wages in each of the periods.

The set of wage differentials which is relevant for education–immigration wage structure studies is determined by the ranking of the labor prices (or marginal productivities). Therefore, if averages of wage differentials for two periods are computed according to the ranking of wages in one of the periods, estimates for changes of wage differentials are involved in a bias. This bias might result from possible errors in specifying the relevant set of wage differentials.

Assuming independent random discrepancies between wages and labor prices (or marginal productivities) in the two periods, estimates for changes of wage differentials computed according to a wage ranking of an arbitrary base period are downward biased. However, by the same assumption the ranking of the labor prices could be estimated from time-series data. This enables the computation of unbiased estimates for the average change of wage (labor price) differentials.

The working hypothesis of independent random discrepancies between wages and labor prices is tested in this article for its internal consistency. This is done together with another test for some implications of an economic model of wage structure developments under conditions of mass immigration. Empirical estimates of relative wage dispersion, relative wage differentials and relative labor prices for the periods of the Second World War and mass immigration to Israel are presented for illustration.

[1] Reprinted from *The Review of Economics and Statistics*, XLIV (November 1962).

40. CONSISTENT ESTIMATION OF DISTRIBUTED LAGS, *by* Nissan Liviatan, *Research Paper 15, 1963, 9 pp. (English)*[1]

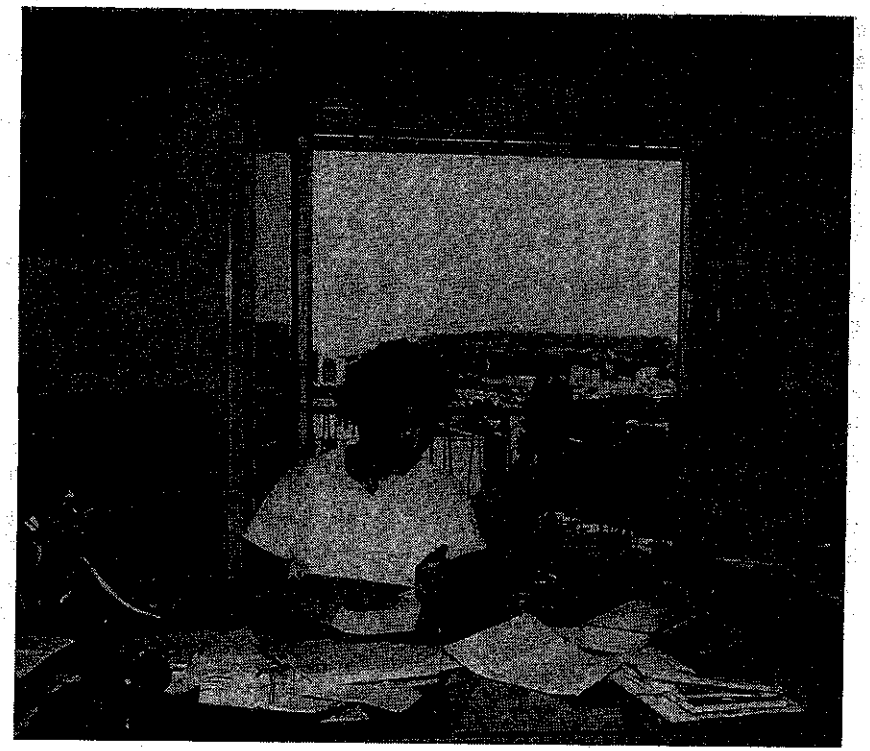
The distributed lag model considered in this paper is usually of the type in which the current value of the dependent variable can be expressed as a linear function of the current value of the exogenous variable, the lagged value of the dependent variable, and an error term. The two latter random variables are then shown to be correlated, which means that the application of the ordinary least squares procedure will lead to inconsistent estimates of the structural parameters (as has been pointed out in earlier works by L.M. Koyck, L.R. Klein and Z. Griliches).

In order to obtain consistent estimates it is suggested to use lagged values of the exogenous variable as instrumental variables. It is shown that the proposed method will be consistent provided the partial correlation of the lagged endogenous variable with lagged values of the exogenous variable (given the current value of the exogenous variable) is different from zero — a condition which will be satisfied in practical applications. The simplest form of our method is to use the first lagged value of the exogenous variable as the instrument. The efficiency of the method can, however, be increased by using as the instrument a linear combination of several lagged values of the exogenous variable. A method of forming this combination is discussed in some detail. The paper concludes with a discussion of some tests of significance associated with our method.

[1] Reprinted from *International Economic Review*, IV (January 1963).

III

BIOGRAPHICAL SKETCHES OF AUTHORS



Administrative offices — hills of Jerusalem in background

Uri Bahral

Uri Bahral was born in Israel, and studied at the Hebrew University, Jerusalem. He received his M.A. degree in Economics and Statistics in 1957 and his Ph.D. in 1962. Bahral worked at the Ministry of Commerce and Industry; he taught at the Hebrew University from 1957 to 1962, except for 1960 when he was a Research Assistant at Stanford University, California.

Dr. Bahral has published several articles, including "Wages," in *Labour Relations in Israel* (Hebrew), 1960, and a book, *Cost per Dollar Earned in Israel* (Ministry of Commerce and Industry, Jerusalem, 1956), which won the Shmorak Prize for 1957.

Haim Barkai

Haim Barkai was born in Dresden, Germany, and immigrated to Israel in early childhood. After graduating from high school in 1944 he served in the Jewish defense forces and was a member of a *kibbutz*. He began his studies at the Hebrew University, Jerusalem, in 1949, and received his Master's degree in 1955. During 1955-58 he was a graduate student of Economics at the London School of Economics, where he graduated with a Ph.D. in 1958. In 1957/58 he served as a tutor at the London School of Economics.

Barkai joined the staff of the Department of Economics at the Hebrew University as junior assistant in 1954. After completing his studies in England, he rejoined the department in 1958. He has been a Lecturer since 1959, and has been appointed Visiting Lecturer at the University of Pennsylvania for the academic year 1964/65. He is a member of several Government committees. Dr. Barkai joined the Falk Project in September 1960, and has been engaged since in the study of the *Sectoral Structure of the Israel Economy*, some results of which have been published in his essay on *The Public, Histadrut and Private Sectors in the Israeli Economy*. He has published articles in *Economica* and the *Economic Quarterly* (Hebrew), and has contributed to the Hebrew Encyclopedia.

Michael R. Barkay

Dr. Barkay studied law, administration, and economics in Israel, England and Italy. After serving in the British Army (1940-46) he served in the Palestinian and Israel Civil Service as a District Officer, as assistant to the Minister of Finance, and as head of the Research Division in the State Comptroller's Office. During 1953-54 he engaged in economic research as a guest of the Italian Government, after which he lectured on public finance at the Tel Aviv University. From 1958 to 1961 he served as United Nations economic expert in several African countries. He is currently Head of the Economic Division of the Central Bureau of Statistics and Executive Secretary of the Israel Public Advisory Committee for Statistics.

His publications include *The Theory of Taxation*, Tel Aviv, 1957; *The Development of Industry 1960*, published by Government Printer, Accra; and various articles in scientitic publicalions.

Shaul Ben-David

Shaul Ben-David was born in Lithuania. He is a graduate of the Department of Agricultural Economics of the Hebrew University, where he received his M.Sc. degree in 1958. From 1959 to 1962 he served as a research assistant in the Department. He is a Ph.D. candidate in Agricultural Economics at Cornell University, where he holds an assistantship.

Yoram Ben-Porath

Yoram Ben-Porath was born in Israel. As an undergraduate at the Hebrew University in Jerusalem he studied Economics and the History of Moslem Countries, and later received an M.A. in Economics. He has been a Research Assistant at the Falk Project since 1959, working on *The Arab Labor Force in Israel.* He is now a Ph.D. candidate at Harvard University.

Tuvia Blumenthal

Tuvia Blumenthal was born in Israel and studied at the Hebrew University. He received his B.A. in Economics in 1959 and his M.A. in 1962. At present he is continuing his studies for the doctorate at the Osaka University in Japan.

David Braude

David Braude was born in Israel and studied Agricultural Economics at the Hebrew University, graduating with an M.A. degree in 1961. He served as a staff member of the agricultural department of the U. S. Operations Mission in Israel, and as assistant to the Agricultural Attache in the American Embassy. At present he holds a position with the Fertilizer Development Council.

Zvi Citron

Zvi Citron was born in Germany, and immigrated to Israel in 1933. He studied at the London School of Economics, 1950-53. He joined the Falk Project in September 1954 and worked there till January 1956. While with the Falk Project he conducted a study on *Investments in Manufacturing Made Through the Investment Center*. In 1956 he joined the Ministry of Agriculture, Economic Planning Department, where he engaged in planning farm systems, with particular reference to their cost and output structures, payment capacities for water, and the markets open to them. Since 1954 he has been with the Industrial Development Bank of Israel, where he is conducting financial and economic feasibility investigations of investment projects.

Daniel Creamer

Dr. Creamer, before serving as the first Director of Research of the Falk Project for Economic Research in Israel during 1954-55, was a senior staff member of the National Bureau of Economic Research, Inc., in New York City. He received his Ph.D. degree from Columbia University in 1935. As a civil servant in the federal government of the United States from 1936 to 1943, he served as an economist on the Social Security Board and later in the National Income Division of the Department of Commerce. During 1944-45 he collaborated with Robert Nathan and Oscar Gass in preparing an economic survey of Palestine. Currently, Dr. Creamer is Manager, Special Projects Department, National Industrial Conference Board, New York, a member of the American Economic Association's Census Advisory Committee, and a Consultant of the Office of Statistical Standards, U.S. Bureau of the Budget.

His publications include: *Is Industry Decentralizing* (1936); *Palestine: Problem or Promise* (with Robert Nathan and Oscar Gass, 1946); *Personal Income During Business Cycles* (1956); and *Capital in Manufacturing and Mining, Its Formation and Financing* (with Sergei Dobrovolski and Israel Borenstein, 1960).

Yitzhak Divon (Honigbaum)

Mr. Divon (Honigbaum) immigrated to Israel from Poland in 1948. He studied Economics at the Hebrew University, receiving his M.A. degree in 1957. During 1955-56 he was a staff member of the the Falk Project, and after a short period with the Bank of Israel he joined the Ministry of Finance. During 1960-62 he served as head of the Economic and Organization Department in the National Council for Research and Development, and in 1962 he joined the staff of the Israel Ports Authority, where he is presently in charge of economic planning and budgeting.

Rachel Floersheim

Rachel Floersheim received her M.A. degree from the Hebrew University in 1955 and her Ph.D. from Johns Hopkins University in 1960. She worked at the Falk Project during 1955-56, collecting the data which underly her study of financial intermediaries in Israel. From 1959 to 1963 she worked for the National Bureau of Economic Research in New York, and during 1961-63 was a Lecturer at the City College of New York. Since September 1963, Miss Floersheim has been working in the research department of the Federal Reserve Bank of New York.

Aryeh Ludwig Gaathon (Gruenbaum)

After his immigration to Palestine in 1934, A.L. Gaathon (Diplomvolkswirt, Dr. rer. Pol. Berlin University, 1934) worked for the Jewish National Institutions on a number of projects, among them *National Income and Outlay in Palestine 1936* (1941), and *Outlines for a Development Plan for Palestine* (1947). After the State of Israel was established, he worked on a four-year development plan (published 1950) and on surveys of the economy for 1950 and 1951 (published 1951 and 1959). In 1953-55 he was

a member of the Economic Advisory Staff, headed by Oscar Gass, and since 1955 he has been Senior Economist at the Bank of Israel. In this capacity, he prepared, *inter alia*, the national accounts estimates for 1955 and 1956, and published his study *Capital Stock, Employment and Output in Israel, 1950-1959*. In 1957-58 he spent several months in the United States on a United Nations fellowship grant, mainly with the Federal Reserve Board in Washington. At present he is engaged in the revision and elaboration of his capital stock and productivity study. Articles by Gaathon have appeared in the *Review of Economics and Statistics*, in the *South African Journal of Economics*, and in German publications.

Arnon Gafni

Arnon Gafni was born in Israel. He holds a B.A. degree from Bard College (1952), and an M.A. in Economics and Statistics from the Hebrew University (1958). He served with the Falk Project as a research assistant, in the budget department of the Defense Ministry, and in the budget department of the Treasury. Since the establishment of the Israel Ports Authority at the end of 1961, Gafni has been head of the Authority's economics and trade department.

Benjamin Gil

Benjamin Gil studied at Rome University, receiving the degree of Dr. Pol. Ec. He held various statistical appointments with the Jewish Agency and the British Mandatory Government before the establishment of the State. During the Second World War he served with the British Army.

After the establishment of the State, he was appointed Director of the Social Demographic Statistics Department in the Prime Minister's Office. He is now United Nations Adviser on census to the Ghana Government.

Uzi Goldenberg

Uzi Goldenberg was born in Israel, and received his M.A. degree in Agricultural Economics from the Hebrew University in 1962. At present he is working in the Negev Regional Planning Division.

YEHUDA GRUNFELD

Yehuda Grunfeld was a Senior Lecturer in Economics and Statistics at the Hebrew University of Jerusalem and Senior Economist at the Falk Project when he died, at the age of thirty, in a drowning accident in July 1960.

Grunfeld was born in Germany and immigrated to Israel as a child. He studied at the Hebrew University, receiving his B.A. in 1953, and his M.A. in 1955. His doctoral work was completed at the University of Chicago, where the was awarded the Ph.D. in 1958. In 1957/58 he served as Assistant Professor of Economics at the University of Chicago. He also served as Project Leader and Adviser to the Transportation Center, Evanston, Illinois.

The main work Grunfeld completed was on "The Determinants of Corporate Investment," which appeared in *The Demand for Durable Goods* (ed. A.C. Harberger, Chicago, 1960). Articles of his also appeared in the *Review of Economics and Statistics*, the *Journal of the American Statistical Association*, *Econometrica*, and the *Journal of Business*. His last - and uncompleted - work was the study of the economic aspects of education in Israel, which he undertook for the Falk Project.

NADAV HALEVI

Nadav Halevi (Ph.D., Columbia University, 1956) was born in the U.S. and came to Israel in 1954, when he joined the Falk Project. He continued with the Prioject until 1957, working on studies in the field of Israel's international trade, and re-joined the Project for a year in 1960 to work on projections of population and income. From 1957 to 1960 he served as Economic Adviser in the Foreign Exchange Division of the Ministry of Finance. Since then he has been a Lecturer in the Department of Economics of the Hebrew University, and since April 1962 Director of Research for the List Institute in Israel. Under the auspices of the latter he is preparing (together with Mrs. Ruth Klinov-Malul) a comprehensive volume on the development of the Israel economy.

GIORA HANOCH

Giora Hanoch was born in Israel. He studied Mathematics at the Hebrew University in Jerusalem, and Economics at the University of Chicago. He joined the staff of the Falk Project in 1956, first as a research assistant and

later as Hebrew editor and a research associate. At the Project he engaged in research projects on tariffs, GATT, the supply of skilled manpower, and and a study of income differentials.

Hanoch has held positions as assistant in statistics and econometrics at the Hebrew University and at the University of Chicago. He has been appointed an Assistant Professor in Economics for the year 1964/65 at the University of Chicago, where he is also carrying out research in the field of human capital and personal incomes.

Hanoch has received various awards and scholarships from the Hebrow University, including the Yehuda Grunfeld Award for his M.A. thesis, which formed the basis for his *Income Differentials in Israel*. At the University of Chicago he held various university fellowships, including a Ford Foundation fellowship in 1963.

MEIR HETH

Meir Heth was born in Israel. He studied in the Faculties of Social Sciences and Law at the Hebrew University, receiving both a B.A. in Economics (1957) and an M.Jur (1959).

Heth started working at the Falk Project as a research assistant in 1955, and later as a Project Supervisor working on a study of banking in Israel. During 1960-61 he practiced as a lawyer, and since April 1962 he has been engaged in economic research at the Bank of Israel, Jerusalem. Heth is also an external teacher in economics at the Hebrew University. He has published articles on banking in Israel, and has prepared a study on *The Legal Framework for Economic Activity in Israel*, to be published under the auspices of the List Institute.

EITAN HOCHMAN

Eitan Hochman was born in Israel. He studied at the Hebrew University, where he received a B.A. degree in Economics (1958) and a B.Sc. in Agricultural Economics (1961). He is now continuing his studies in Agricultural Economics at the University of California at Berkeley, where he is a Ph.D. candidate.

Avner Hovne

Avner Hovne, formerly Adrian B. Schwartz (M.A., University of Wisconsin, 1935) was an economist wirh the National War Labor Board in Washington just before he settled in Israel in 1946. After several years in a *kibbutz*, he entered the Israel civil service. He is presently Economic Adviser to the Ministry of Labor. He has served as Economic Consultant to the Puerto Rico Planning Board and as Educational Economist with a Unesco team in Trinidad and Tobago. He has published articles in the Israel *Economic Quarterly* and a study (in Hebrew) of the Israel bus cooperatives.

Avraham A. Kessler

Avraham A. Kessler was born in the United States and immigrated to Israel in 1949. He received his training in Economics at the City College of New York and the University of Wisconsin. He worked at the Falk Project intermittently during 1954-58, and later was a staff economist with the Economic Advisory Staff, attached to the Prime Minister's Office, and worked with other Government Ministries. He has taught at the University of Wisconsin, the Hebrew University, and Bar-Ilan University, and has held a research training fellowship of the Social Science Research Council. Kessler is now managing director of the Economic Research Corporation Ltd., which does economic research and consulting work for public and private institutions.

Yoav Kislev

Yoav Kislev was born in Israel. He received his B.Sc. (1960) and M.Sc. (1961) in Agricultural Economics from the Hebrew University. At present he is continuing his studies at the University of Chicago, where he is a Ph.D. candidate in Economics.

Ephraim Kleiman

Ephraim Kleiman was born in Poland and came to Israel as a child. He is a graduate of the Hebrew University in Jerusalem, and obtained his Ph.D. degree from the London School of Economics in 1958. From 1958 to 1961 he was engaged on research with the Falk Project. In 1962-63 he was in charge

of the overall plan at the Israel Economic Planning Authority. He is now a Lecturer in Economics at the Eliezer Kaplan School of the Hebrew University.

Ruth Klinov-Malul

Ruth Klinov-Malul was born in Germany and came to Israel as a child. She studied at the Hebrew University, where she received her M.A. degree in 1958, and her Ph.D. in 1964. From 1954 to 1962 she worked at the Falk Project, first as a research assistant and afterwards as a project supervisor. Since 1963 she has conducted research at the List Institute for Economic and Social Studies, and has also taught at the Hebrew University.

Her studies which have been published by the Falk Project concern various aspects of Israel's manpower. She is now engaged in writing, with Dr. N. Halevi, a general survey of the economy of Israel, to be published by the List Institute.

From 1958 to 1962 she was a consultant on professional manpower surveys to the National Council for Research and Development, and since 1963 she has acted as a scientific secretary of the Commission for Survey of Higher Education, established by the Ministry of Education.

David Levhari

David Levhari was born in Israel. He studied at the Hebrew University, receiving his B.A. in Economics in 1959 and his M.A. in 1961. He completed his studies at the Massachusetts Institute of Technology, where he received his Ph.D. in 1964. He has now joined the staff of the Department of Economics of the Hebrew University.

Nissan Liviatan

Nissan Liviatan was born in Lithuania and immigrated to Israel with his family as a boy. After graduating from high school in 1943 he served in the Jewish defense forces till 1949. In that year he began his studies at the Hebrew University and received his M.A. degree in Economics in 1954. During 1954-56 he was a graduate student at Oxford University. He returned to Jerusalem in 1957 and received his Ph.D. degree in 1961.

Liviatan joined the staff of the Department of Economics at the Hebrew

University as a junior assistant in 1953. After completing his studies in England he rejoined the Department in 1957, and became Senior Lecturer in 1963. In 1957, Dr. Liviatan joined the Falk Project, which published his *Consumption Patterns in Israel* in 1964. He also engaged in research on family savings in Israel. He has published articles in *Econometrica* and *International Economic Review*.

HAROLD LUBELL

Harold Lubell worked with the Falk Project as Senior Economist in 1954-55 and as Director of Research in 1956. He obtained his B.A. from Bard College in 1944 and his Ph.D. from Harvard University in 1953. Before joining the Falk Project, he had worked as a statistician with the U.N. Statistical Office at Lake Success and the U.N. Economic Commission for Europe in Geneva (1948-49), and as an economist with the U.S. Operations Mission in Paris (1949-53).

Since leaving the Falk Project, he has been the Middle East area specialist in the Economics Department of the RAND Corporation in Santa Monica, California (1957-62), the national accounts specialist with the Brookings Institution Economic Specialists Group (Ford Foundation) in Saigon, Vietnam (1963-64), and the Ford Foundation's national accounts adviser to the Economic Planning Unit of the Government of Malaysia in Kuala Lumpur (1964). He is currently a research associate with the Project on Research in the International Economics of Disarmament and Arms Control (RIEDAC) at the Columbia University Graduate School of Business. His publications include *Middle East Oil Crises and Western Europe's Energy Supplies* (Johns Hopkins, 1963) and a number of articles in various journals.

MICHAEL MICHAELY

Michael Michaely was born in Kinneret, Israel. He served in the Jewish defense forces during 1945-49. He received his M.A. degree from the Hebrew University in 1952, and his Ph.D. degree from Johns Hopkins University in 1955. In 1954/55 he participated in the Training Program of the International Monetary Fund in Washington.

Michaely joined the staff of the Department of Economics at the Hebrew University in 1955 as Lecturer; he was appointed Senior Lecturer in 1961,

and has been Chairman of the Department since 1962. During 1955-59 he was adviser to the Research Department of the Bank of Israel. In 1959/60 he held a Rockefeller Fellowship and the Postdoctoral Fellowship in Political Economy at the University of Chicago. He joined the Falk Project in November 1960, and has been engaged since in a study of the exchange-rate system and the effective rate in Israel. He has served as a member of several governmental committees. Michaely has published two books: *Concentration in International Trade* (1962), and *Foreign Trade and Capital Imports in Israel* (1963) (Hebrew). He has also published articles in the *American Economic Review*, the *Economic Journal*, the *Journal of Political Economy*, the *Review of Economics and Statistics*, and *Economic Internazionale*.

YAIR MUNDLAK

Yair Mundlak was born in Israel. He received a B.S. degree in Agricultural Economics in 1953 from the University of California at Davis, an M.A. in Statistics in 1956 and a Ph.D. in Agricultural Economics in 1957, the latter two from the University of California at Berkeley.

In 1957 he joined the Faculty at the Hebrew University, where he is now a Senior Lecturer in Agricultural Economics. In 1961-63, while on leave of absence, he was a Visiting Associate Professor in Agricultural Economics at the University of California at Berkeley, and in the summer of 1963 he held an appointment as a Research Associate in Economics at the Massachusetts Institute of Technology.

Mundlak has worked on problems of Israel agriculture, in which field he has published several articles and two books: *Long-Term Projections of Supply and Demand for Agricultural Products in Israel* and *An Economic Analysis of Established Family Farms in Israel: 1953-1958*. In addition he has written several articles on econometrics, mainly in the field of measurements of production and behavioral functions.

HELMUT V. MUHSAM

H.V. Muhsam (Dr. es Sc., Geneva, 1937) was connected with the Falk Project, on a part-time basis, from 1954 to 1959), while he was lecturer in Statistics at the Hebrew University. Earlier, he was a statistician with the Jewish Agency (1938-39), with the *Vaad Leumi* (1940-44), with the Mandatory Government of Palestine (1944-48), and the Central Bureau of

Statistics (1948-52). In 1950 he joined the Department of Statistics of the Hebrew University, of which he is now chairman. While on leave from the Hebrew University, he was, in 1958/59, Social Affairs Officer of the United Nations, where he was, part of the time, in charge of the Population Branch, and in 1961/62 he was Visiting Associate Professor of Sociology and Public Health at the University of California at Berkeley.

Muhsam, who is Vice-President of the International Union for the Scientific Study of Population, is mainly interested in the demography of underdeveloped countries and has published numerous articles of a methodological character as well as substantive analyses in *Population Studies* and other journals. At present, he is engaged in applying matrix algebra to the study of internal migration, in developing a multidimensional approach in discussing the question of the Jewish "race," in analyzing fertility data from the 1961 Census of Israel, and in establishing methods for forecasting population data for social and economic planning in underdeveloped countries.

Michael Noam

Michael Noam, M.A. (Agric.) studied at Oxford (1936-40), and after research and teaching appointments at the Universities of Oxford and Bristol and the Rowett Research Institute, served in the Jewish Brigade (1945-46). In 1946 he was appointed Agricultural Officer in the Palestine Mandatory Government. During the War of Independence he served in the Israel Defense Forces. Since 1949 he has been with the Central Bureau of Statistics, where he directed the 1950 Census of Agriculture (1949-53) and was responsible for the agricultural sector of the National Accounts (1954-60). During 1960-62 he was seconded as a consultant to the Puerto Rico Department of Agriculture and on his return directed the Publications Section of the CBS (1962-64). At present he is preparing a methodology of agricultural statistics and is also acting as consultant of the Organization of Economic Cooperation and Development to the Regional Planning Unit of the Greek Ministry of Co-ordination.

He cooperated in the Falk Project's study on established family farms (1954-56), and his 1952 bench mark of the *National Income Originating in Agriculture* was prepared under the joint auspices of the Falk Institute and the CBS. Other publications appeared in the CBS Special Series.

Don Patinkin

Don Patinkin was born in the United States and was educated at the University of Chicago, where he received his Ph.D. degree in 1947. From 1947-48 he served as Assistant Professor of Economics at the University of Chicago and as a Research Associate of the Cowles Commission for Economic Research. He came to Israel to join the Hebrew University in the spring of 1949, and has been a member of the University staff since that date. He has served as a Professor of Economics since 1957. In 1956 he was appointed Director of Research of the Falk Project, and has continued in this capacity with the Maurice Falk Institute. He has also served on many governmental committees, and as Visiting Professor in several American universities.

Patinkin's publications include *Money, Interest, and Prices* (1956, second edition in press) and *The Israel Economy: The First Decade* (1959). He has also published articles on monetary, price, and employment theory in various professional journals.

David Pines

David Pines was born in Italy and came to Israel as child. He studied at the Hebrew University, receiving his B.A. degree in 1960. His first professional position was with the Minstry of Finance. During 1958-59 and from 1960 to 1962 he engaged in research at the Falk Project. At present he is head of the budget department of the Tel Aviv Municipality.

His publications include "Foreign Currency Controls and Price Distortion" and "Measures of Economic Independence" in the *Economic Quarterly* (Hebrew).

Marshall Sarnat

Marshall Sarnat was born in the United States. He obtained his B.A. degree from the Hebrew University in 1955, and his M.B.A. from Northwestern University in 1957. He joined the staff of the Falk Project as a research assistant in 1954, and served as Project Supervisor in 1955 and again in 1960-62. During 1957-58 Sarnat held the James D. Barker Fellowship at Northwestern University. In 1959 he joined the staff of the Department of Business Administration, Hebrew University. He is currently conducting research on the emergence of the capital market in Israel and on capital investment decision.

Moshe Sicron

Moshe Sicron is a native-born Israeli, and is now Deputy Director of the Central Bureau of Statistics. A graduate in Statistics and Economics of the Hebrew University in 1952, he is the author or co-author of studies of the Central Bureau of Statistics on population, labor force, and consumption in Israel economy.

Mark Wilsker

Mark Wilsker was born in South Africa, and came to Israel a child. He studied Agricultural Economics at the Hebrew University, graduating with an M.Sc. degree in 1962. He is economic adviser to the Agricultural Attache of the American Embassy in Israel.

Dan Yaron

Dan Yaron was born in Israel. He received his M.Sc. degree in Agriculture from the Hebrew University in 1955, and his Ph.D. in Agricultural Economics from the University of Iowa in 1960. Since 1960, Yaron has been an Instructor in the Department of Agricultural Economics of the Hebrew University. He has published several papers on economic problems of Israel agriculture, particularly on agricultural planning and water.

IV

PUBLICATIONS

A. PUBLISHED BY THE FALK PROJECT FOR ECONOMIC RESEARCH IN ISRAEL

Nadav Halevi, *Estimates of Israel's International Transactions, 1952-1954*, October 1956, IL 2.50, $2.00 (Hebrew and English).

Nadav Halevi and Giora Hanoch, *Israel and the General Agreement on Tariffs and Trade* (mimeographed), December 1957 (English). Out of print.

Zwi Citron and Avraham Kessler, *Investments in Manufacturing Made Through the Investment Center* (mimeographed), April 1958 (English). Out of print.

H. V. Muhsam, Giora Hanoch and Ruth Klinov-Malul, *The Supply of Professional Manpower from Israel's Educational System*, March 1959, IL 3.50 (Hebrew, with English summary).

Don Patinkin, *The Israel Economy: The First Decade*, November 1960, IL 2.00, $2.00 (Hebrew and English; reprinted from the *Fourth Report: 1957 and 1958*).

Avner Hovne, *The Labor Force in Israel*, July 1961, IL 3.00, $2.00 (Hebrew and English).

Rachel Floersheim, *Financial Intermediaries in Israel: 1952–1954* (offset), November 1962, IL 2.50 (Hebrew, with English summary).

David Pines, *Direct Export Premiums in Israel: 1952–1958*, October 1963, IL 5.00 (Hebrew).

Meir Heth, *Banking Institutions in Israel: 1950–1961*, December 1963, IL 5.00 (Hebrew; English in press).

Nissan Liviatan, *Consumption Patterns in Israel*, January 1964, IL 3.00, $2.00 (Hebrew and English).

Yair Mundlak and Others, *Long-Term Projections of Supply and Demand for Agricultural Products in Israel*, 2 vols. (*Overall View and Summary* and *Branch Studies*), May 1964, each volume IL 4, $2.50 (Hebrew and English). Published jointly with the Faculty of Agriculture, The Hebrew University.

Yair Mundlak, *An Economic Analysis of Established Family Farms in Israel: 1953–1958*, July 1964, IL 3.00 (Hebrew and English).

Uri Bahral, *The Effect of Mass Immigration on Wages: Israel, 1948–1958*, in press (Hebrew and English).

Avraham Kessler, *Israel's Terms of Trade Under Its Clearing Agreements* (offset), in press (Hebrew).

B. RESEARCH PAPERS

1. Nadav Halevi and Giora Hanoch, *Israel and the General Agreement on Tariffs and Trade*, January 1958, IL 0.75 (Hebrew, with English summary).
2. Zwi Citron and Avraham Kessler, *Investments in Manufacturing Made Through the Investment Center*, March 1958, IL 0.75 (Hebrew, with English summary).
3. Arnon Gafni, Nadav Halevi and Giora Hanoch, *Israel's Tariff Structure and Functions*, April 1958, IL 0.75 (Hebrew, with English summary).
4. Ruth Klinov-Malul, *Productivity of Labor and Machines in Israel's Cotton Spinning Mills*, September 1958, IL 0.75 (Hebrew and English).
5. Harold Lubell and Others, *Israel's National Expenditure: 1950–1954*, August 1958, IL 0.75 (Hebrew).
6. *Survey of Family Savings 1957/58* (*Preliminary Report*). A joint report with the Central Bureau of Statistics, Bank of Israel, and the Institute of Applied Social Research, December 1959, IL 0.75 (Hebrew and English).
7. Yitzhak Honigbaum, *The Development of Production and Prices in the Vegetable Branch*, March 1960, IL 0.75 (Hebrew, with English summary).
8. *Survey of Family Savings 1957/58 and 1958/59* (*Preliminary Report*). A joint report with the Central Bureau of Statistics, Bank of Israel, and the Institute of Applied Social Research, September 1960 (English). Out of print.
9. Yair Mundlak, *Empirical Production Function Free of Management Bias* (Reprint), February 1961, IL 0.60 (English).
10. Yair Mundlak, *Aggregation Over Time in Distributed Lag Models* (Reprint), October 1961, IL 0.75 (English).

11. Nissan Liviatan, *Errors in Variables in Engel Curve Analysis* (Reprint), December 1961, IL 0.75 (English).
12. Nissan Liviatan, *Tests of the Permanent-Income Hypothesis Based on a Reinterview Saving Survey* (Reprint), October 1963, IL 0.75 (English).
13. Yair Mundlak, *Estimation of Production and Behavioral Functions from a Combination of Cross-Section and Time Series Data* (Reprint), November 1963, IL 0.75 (English).
14. Uri Bahral, *Wage Differentials and Specification Bias in Estimates of Relative Labor Prices* (Reprint), July 1963, IL 0.75 (English).
15. Nissan Liviatan, *Consistent Estimation of Distributed Lags* (Reprint), July 1963, IL 0.75 (English).
16. David Pines, *Direct Export Premiums in Israel: 1952–1958*, July 1963, IL 0.75 (English).

C. PUBLISHED JOINTLY WITH THE CENTRAL BUREAU OF STATISTICS

Michael Noam, *National Income Originating in Israel's Agriculture, 1952–1954*, Central Bureau of Statistics — Special Series No. 48, April 1956 (Hebrew and English; Technical Notes in English only). Out of print.

Benjamin Z. Gil, *Settlement of New Immigrants in Israel: 1948–1953*, (mimeographed), April 1957 (English). Out of print.

Daniel Creamer and Others, *Israel's National Income: 1950–1954*, Central Bureau of Statistics — Special Series No. 57, May 1957, IL 2.00, $2.00 (Hebrew and English).

Moshe Sicron, *Immigration to Israel: 1948–1953*, Central Bureau of Statistics — Special Series No. 60, August 1957, IL 2.00, $2.00; *Statistical Supplement*, IL 1.75, $1.50 (Hebrew and English). English out of print.

R. M. Barkay, *The Public Sector Accounts of Israel: 1948/49–1954/55*, (mimeographed), 2 vols., December 1957 (English). Out of print.

Harold Lubell and Others, *Israel's National Expenditure: 1950–1954*, Central Bureau of Statistics — Special Series No. 74, July 1958, IL 2.00, $2.00; *Appendixes* (mimeographed), IL 1.25, $1.50 (English). Appendixes out of print.

A. L. Gaathon, *Survey of Israel's Economy: 1951*, Central Bureau of Statistics — Technical Paper No. 1, February 1954 (English). Out of print.

D. REPORTS OF THE FALK PROJECT

First Annual Report: 1954. Out of print.
Second Annual Report: 1955. Out of print.
Third Annual Report: 1956. Out of print.
Fourth Report: 1957 and 1958. Out of print.
Fifth Report: 1959 and 1960. Obtainable on request.
Sixth Report: 1961–1963. Obtainable on request.
A Ten Year Report: 1954–1963. Obtainable on request.

V

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[1] The names of persons who appear in the section on Biographical Sketches of Authors are not repeated here.

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