THE EFFECT OF MASS IMMIGRATION ON WAGES IN ISRAEL

by

URI BAHRAL

FALK PROJECT FOR ECONOMIC RESEARCH IN ISRAEL

ABOUT THE BOOK

This study discusses the effects of mass immigration and its absorption into employment upon the level and structure of wages and upon the wage policy of the labor market institutions in Israel during 1948–1958. The main problem discussed is the extent to which wage fixing procedures were affected by the existence of a large supply of unskilled labor caused by the mass immigration.

The analysis of changes in the wage level shows that as far as the industrial worker was concerned the increase in the real wage level was practically halted during the years of mass immigration. On the other hand, from the point of view of an employer, labor prices (e.g. wages in industry divided by cost of equipment) declined significantly after the first wave of immigration.

As for wage differentials — it seems that throughout the period discussed they widened considerably. In this connection it is worth noting that contrary to popular opinion, the cost-of-living allowances widened the relative wage differentials during this period, as did various other social allowances.

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FOREWORD

This study deals with the extent to which wage determination in Israel was affected by the large influx of unskilled workers and by their absorption in employment between 1948 and 1958. The changes in level and structure of wages and in the wage policy of labor market institutions are discussed.

Most of the data used concern the industrial sector, since time series for other sectors are lacking. However, the industrial labor market in this country is exceptionally institutionalized and centralized, so that some of the findings of the study may further the understanding of the more general problem: the importance in the labor market of supply and demand as compared with institutional forces. Most of the data are from the Central Bureau of Statistics; in preparing the calculations I was greatly aided by the Stanford Computation Center.

I am deeply indebted to many people for their help at various stages of the work, especially Professor D. Patinkin of the Hebrew University and Professor M. W. Reder of Stanford University. I am grateful to the staff of the Falk Project who have given invaluable help in the preparation of this study and its publication.

U.B.

CHAPTER I

SUMMARY AND CONCLUSIONS

In Israel, as in other modern countries, wages are determined mostly by labor market institutions through collective bargaining processes. In order to explain and predict wage developments, it is necessary to assume the existence of behavioral laws governing the institutions concerned. The question is, however, whether this is a permissible assumption.

The assumption is often regarded as extreme. But the alternative assumption—that the parties to collective bargaining determine any arbitrary wage level and structure they happen to choose—is obviously out of the question since it contradicts our experience. We know that wages tend to behave systematically, and subject to a certain margin of error, we can guess how they are fixed through collective bargaining. Thus, we usually assume that institutional wage policies are based on facts rather than chosen at random. We also assume that there are laws of institutional behavior that determine at least probability margins for wage decisions.

We do not know much about the laws which fix limits to collective bargaining results. It seems that political, sociological, psychological and other factors might explain some of the processes. Yet without denying the role of these factors in wages determination, we usually assume that both sides to collective negotiations are influenced to a great extent by economic considerations. If, for example, a shortage of workers is created, we tend to assume that the relative position of employers in the bargaining process is weakened: employers cannot easily withstand wage demands, and each finds it worthwhile to defend himself against his competitors by increasing the wages of his own employees. On the other hand, when there are plenty of workers in the labor market, we generally assume that the bargaining power of employees is weakened, because they fear (for instance) layoffs and direct or indirect competiton from unorganized labor.[1]

1 In the case of absolute wage rigidity, we usually assume that employers respond to an increased supply of workers by raising hiring standards, and that they respond to a shortage of workers by lowering standards. As a result of these changes in hiring standards, wages (from both the employers' and employees' points of view) are reduced

This is far from being a complete theory of wage determination, but the theoretical reasoning might serve to partly explain wage movements over time: in various countries we find, for instance, that major wage increases occur during periods of prosperity and tight labor markets. On the other hand, we usually find relatively stable levels of wages (and even reductions) in periods of depression and easy labor markets.

Such developments are usually explained by 'economic laws' which have often been found valid. But can these laws also explain wage changes in the Israel labor market? Do we find that an oversupply of workers in Israel (or unemployment in certain groups of workers) causes a relative reduction in their wages? The answer to this and related questions may help in the analysis, and, hopefully, in predictions of wage developments in Israel.

What can we learn about this subject from the past experience of Israel?

In May 1948, Israel was opened to mass immigration. During the following three years the population of the country almost doubled and its labor market was flooded by new job seekers. This, however, did not immediately create an excess supply of labor in the market, because some immigrants were absorbed in vacancies (in the war economy and in deserted cities and villages), while others were kept in temporary immigration camps. The situation changed radically in the middle of 1949, when the pressure of job seekers became noticeable, and it increased steadily until 1951 at least.

There were several reasons for this. In 1949 the army began to discharge thousands of soldiers, and at the beginning of 1950 the Jewish Agency began to close the public kitchens in the immigrant camps. At the same time, new waves of immigrants were being sent to employment centers almost on arrival.

How did this plentiful supply of manpower influence wage levels in Israel's first decade? A full answer to this question requires a detailed analysis of the wage determination process in each labor market. However, not all the necessary data are available, and we shall therefore limit ourselves to a discussion of such wage trends as may be studied from what data there are.

According to the Central Bureau of Statistics (CBS) index of daily earnings in manufacturing, nominal wages rose steadily during Israel's first decade: about five and a half times during 1948–58 and four and a half times during 1950–58. We are interested, however, in real wages—and for

when the supply is plentiful, and increased when there is a shortage. See M. W. Reder, "The Theory of Occupational Wage Differentials," *American Economic Review*, Dec. 1955, 833–852.

this question the nature of the price deflator is crucial. This, of course, depends on the kind of 'real wages' in which we are interested: either the real income of the workers, or the relative price that employers pay for labor services.

The worker is interested in the buying power of wages; more specifically, in the rise of wages relative to the rise of consumer prices. When we wish to eliminate the effect of price increases on the real wages of workers, we should use the price index of the goods consumed by the workers — the cost-of-living index, for instance.

Quite different is the employer's point of view on relative wage movements. The employer is interested in the real price that he pays for labor services; specifically, he considers the rise of wages in comparison with (a) the increase in the selling-price of his products (in the local and export markets), and (b) the increase in the price of factors of production which can be substituted for labor.[2] Indexes of these prices (and not of the cost-of-living) should be used to examine the development of real wages from the employer's point of view. If, for instance, we deflate the index of nominal wages by an index of product prices, or by a price index for other factors of production, we obtain indexes showing changes in labor service prices relative to product or other factor prices.

Let us examine first the movements of real wages from the workers' point of view.

Real wages of workers in manufacturing, according to CBS data, rose steadily from 1948 to 1958, continuing a trend that began in 1942. This is shown by an index of real wages obtained by deflating the nominal wages index by the Consumers' Price Index. But this cost-of-living index is not a reliable measure of price changes for the period of mass immigration. For this was a time of rationing and price controls and of an extensive black market, when people bought commodities not all of which were included in the official basket. Furthermore, black market prices (which were not considered in calculating the Consumers' Price Index during the mass-immigration period) rose steadily in those years, unlike the relatively stable official prices.

In view of the relative increase of black market prices, the increased quantities of goods sold in this market, and the rationing of commodities included in the index basket, we may conclude that the cost-of-living index underestimates the true price increase of commodities consumed by workers

[2] The employer is also interested in productivity changes, which we shall not deal with here.

in the period of mass immigration. Hence, it is possible that real wages did not rise during the period.[3]

Let us now consider real wages from the viewpoint of the employer. Indexes of real labor prices will enable us to answer the following question: are wage policies determined in the labor market in such a way as to reduce unemployment? The relevance of the indexes for this question follows from the assumption that a reduction in the relative price of labor can help in employing newcomers: when wages rise more slowly than product prices employers find it profitable to increase production and employment; and when wages rise less than prices of other factors of production employers find it profitable to increase the production of products that require relatively more labor inputs, and to use fewer labor saving machines.

How did the relative price of labor—the real wages from the employer's point of view—develop in the first decade of the State? A complete answer to this question requires indexes of commodity prices at producers' cost. Since none are available, the question can be answered only in part.

Nominal wages in industry rose during the first decade of the State relatively less than import and export prices. During 1950–58, nominal wages rose approximately four and a half times. In the same period import prices rose almost sixfold, and the exchange rate for the added value of exports (mainly labor inputs) rose even more. Thus it is quite reasonable to suppose that the price of labor from the employer's viewpoint declined relative to product prices in export and import-substitute industries.[4] This reduction in real wages occurred from 1952 on.

These findings tell us nothing about the development of wages and product prices in other industries. Owing to the lack of data we do not know which industries followed the 'foreign trade' industries' example. It should be stressed that we do not expect relative labor prices to decline in every industry—this is our expectation only for the national average.

As a second step in determining the development of wages from the employer's point of view, let us observe whether labor service prices decline relative to those of the other factors of production: did the plentiful supply

[3] See D. Patinkin, *The Israel Economy: The First Decade*, FP, Jerusalem, 1960, pp. 38–39; 108–111.

[4] We assume that, for 1950–58, changes in the prices of import substitutes can be measured by the index of import prices. This index overestimates the price increase of 1950–54, while it understimates the increase during 1955–58, (*ibid.*, p. 46). On the basis of the available data we do not know whether the two opposite trends cancelled each other out. But in view of the relatively large difference between the rise of international goods prices and the rise of wages, it seems that we are not wrong in our conclusion, (*ibid.*, pp. 123–124).

of workers reduce the relative price of labor, thus increasing employment at the expense of the other factors of production? We shall confine ourselves to a comparison of the rise of nominal wages to that of capital equipment prices since there are no adequate indexes for other factors.

As stated, nominal wages rose about four and a half times from 1950 to 1958. In the same period, prices of capital equipment rose—mainly as a result of local currency depreciation—about seven and a half times. The actual price rise was even greater: the national accounts data (from which the price index of equipment was calculated) do not take into consideration several factors that raised the effective cost of equipment. Among these factors were: the rise of interest rates which took place during the period; the linking of government loans to the dollar exchange rate; the reduction of the government's share in the financing of private investment; and, finally, increasing efficiency in obtaining repayments of government loans granted for development projects. Nevertheless, we find that regardless of these considerations—the price index of labor (relative to the market prices of equipment) declined from 1952 until 1954, when it was at about half of the 1950 level. From 1954 to 1958 the index rose only slightly.

A decline in the relative price of labor is not often found in other countries. In Palestine too, during the mandatory period, the relative price of labor rose steadily (at least from 1943). This might suggest that there is some connection between the special circumstances of Israel—mass immigration—and the decline of the relative price of labor. It might also suggest that wage-determination in Israel is not an isolated function, but is linked to various variables in the labor and other markets, such as the commodity and capital markets.

So far we have considered the effect of an oversupply of labor on the general level of real wages in Israel. However, mass immigration did not create an oversupply of all workers, but mainly of the unskilled. This is reflected in the CBS data on the occupational structure and educational level of new immigrants, as well as in the labor-exchange unemployment data. This should lead us to expect the oversupply of workers to be reflected primarily in the level of unskilled wages.

Do we, then, find that skilled wages rose faster than unskilled wages in the period 1948–58? A complete answer to this question requires detailed studies of the various kinds of wage differential, and their development at different times and in different industries. The main difficulty in carrying out these inquiries is the absence of sufficient and accurate data. Nevertheless, the available data provide some tentative answers.

The relative wage differentials of workers performing different jobs (when

comparing high with low wage groups) on the average widened during the first ten years of the State.[5] This is true for the first years of mass immigration, and for the period of the second wave of immigration, 1955–58. The widening of relative wage differentials was helped by the system of social benefit payments and all other wage components, including cost-of-living allowances. An exception is the period 1952–53, when cost-of-living allowances worked to narrow relative differentials. However, relative wage differentials in industry were not reduced even in these years, because of the influence of other allowances—especially efficiency premiums—which offset the egalitarian influence of the cost-of-living allowances. From January 1954 until 1957 cost-of-living allowances again operated to widen wage differentials. Finally, we note that after 1955 differentials were widened by changes in the basic wage rates too. This relative price increase of higher paid labor services in Israel should be stressed in view of the downward trend of occupational differentials found in most modern economies, and in mandatory Palestine up to the end of the second world war.

The main finding here is that the state of the labor market considerably influenced the process of wage determination. The assumption that labor market institutions determine their wage policies in accordance with labor scarcity (because they wish to solve unemployment problems, or because their bargaining power is affected by unemployment, or for reasons which we do not know) is supported by the data for the first decade of Israel's existence. The alternative assumption—that the institutions were not sensitive to unemployment, or, in the extreme case—that institutional wage policies aggravated unemployment—is not consistent with the data.

This does not imply that none of the unemployment can be attributed to wage policies of institutions. It can be argued that there were wage decisions which at given points in time resulted in unemployment. But over the period we find that relative prices of different kinds of labor moved in the "right" direction: namely, towards a solution of unemployment problems. We cannot say, however, how far the increased employment was due to wage policy, and how far it was due to other factors, such as education and investment in equipment. Nor can we say if sufficient effort was made by the various institutions to adjust wages so as to deal with unemployment. These questions are beyond the scope of this study.

[5] This statement is based on countrywide time series of: (1) average daily wages in 12 to 16 manufacturing industries, and (2) average annual income of salaried graduates.

CHAPTER II

THE CAPITAL-LABOR RATIO

In its first decade the Israel economy was characterized by much institutional intervention in wage and price determination. This is obvious in the labor market, in which wage rates are determined by collective bargaining, and in the international goods market, in which foreign currency exchange rates are determined by the government.

In these two markets wage and price determination are concentrated in the hands of a few powerful institutions. Labor unions, which bargain with employers' associations under the supervision of the Trade Union Department of the Histadrut (The General Federation of Labor) represent nearly 90 per cent of all employees in the economy.[1] The government, which determines exchange rates and decides on export premiums and import levies, controls every foreign trade transaction made by residents of the country.

The central position of labor unions and the government in the labor and international goods markets raises the question whether these institutions carry out wage and price policies which are independent of the changes of supply and demand in the various markets.

1. *The Problem*

Mass immigration, which almost doubled Israel's population within the three years 1948–51, and which was renewed in 1955–57, considerably increased the supply of workers. According to the general theory of price determination a relative increase in the economy's supply of labor sets in motion market forces which tend to reduce the relative price of labor services. Moreover, because mass immigration increased mostly the supply of unskilled workers — market forces should have reduced (under constant returns to scale) mainly the relative price of unskilled labor.

[1] See Histadrut, *Alon Statisti* No. 20, Aug. 1956, pp. 2–3 (Hebrew); the figures shown there do not include members of Hapoel Hamizrachi, who joined the Histadrut Trade Union Department in October 1952, and members of Poalei Agudat Yisrael, who joined in April 1953. For the Mandatory period, see R. R. Nathan, O. Gass and D. Creamer, *Palestine: Problem and Promise*, Washington, 1946, pp. 286–7.

Immigration created, therefore, forces that worked contrary to the traditional wage policy and to the deeply rooted egalitarian ideology of the Jewish labor movement. Mass immigration itself strengthened this ideology in accordance with the national task of absorbing new immigrants in the economy and society of Israel. The higher the degree of complementarity in production between unskilled and skilled labor on the one hand, and between unskilled labor and capital on the other,[2] the greater the contrast between market and institutional forces. For if complementary relations exist between unskilled and skilled workers, a relative increase in employment of new immigrants and unskilled laborers (which reduces their marginal productivity) increases the marginal productivity of skilled workers causing an upward pressure on their wages, compared with the wages of the unskilled. And if there is a higher degree of complementarity between unskilled labor and capital (higher than between unskilled and skilled labor), a relative increase of unskilled employment causes an upward pressure on capital prices compared with labor prices, and on the wages of the skilled workers compared with the wages of the unskilled.

The relative price of unskilled labor has, therefore, been pushed downwards — despite an egalitarian ideology — because of the increased supply of manpower and the increased marginal productivity of capital and skilled workers resulting from increased employment of the unskilled. An investigation of relative wage movements in Israel might therefore, cast light on the more general question — the relative importance of supply and demand in the labor market and the institutional factors.

Another, no less important, question arises: how did mass immigration influence the wage policy of labor market institutions? Did these institutions continue their traditional wage policy, or did they perhaps choose to adapt themselves to the new situation?

The actual state of the labor market in the first decade of the State presented an urgent problem of employing new immigrants and unskilled

2 The condition for unskilled labor and capital being complementary is that a substitution of unskilled for skilled labor (the amount of capital being kept constant) should move the marginal rate of substitution of capital for skilled labor in favor of capital. See J. R. Hicks, *Value and Capital*, Oxford, 1946, Chapters III and VII, p. 92.
A similar definition of complementarity is applicable to increases of all factors of production under constant returns to scale. When all factors increase at the same rate, the marginal rates of substitution remain constant. And if the term substitution of unskilled for skilled labor is generalized to include a greater increase of unskilled (relative to skilled) that equates the relative increases of output and capital — the above definition of complementarity acquires a broader meaning, which is applicable in our case.

workers. Social and economic absorption of immigration is frequently taken to mean the equalization of living standards and, in particular, wages and incomes of new and veteran inhabitants. This is essentially a long-run concept. A well-known implication of this concept is provision for immigrants of education, training and other 'human investments' in order to enable them to approach — economically and socially — the standard of living of veteran settlers.

Quite different is the concept of absorption of mass immigration in the short-run. Most human investment and other methods of reducing wage differentials in the long-run cannot, of course, be applied as a short-run remedy for unemployment among new immigrants and unskilled laborers. Instead, the short-run adjustment depends on the creation in the market of wage differentials sufficiently wide (and more precisely, the creation of a sufficiently low relative price of unskilled labor) to convince employers of the profitability of employing new immigrants and unskilled laborers.

It is, however, possible to employ new immigrants by work-relief schemes or by other means of increased government spending, without reducing the relative price of unskilled labor services. But increased government spending (and in particular, deficit financing) may under these circumstances lead to the creation (or increase) of excess demand in the product, capital and skilled labor markets, which would tend to raise the general level of prices and wages of the skilled, compared with the relatively stable wages of the unskilled.

Rapid absorption of immigrants in regular employment in a stable economy requires, therefore, a quick reduction of the relative price of unskilled labor. Consequently, we shall ask whether labor market institutions in fact abetted this process — set in motion by mass immigration; whether they were prepared to work against the prevailing egalitarian ideology, and to change traditional wage policy, so as to create a pattern which could provide the necessary wage differentials and relative labor prices.

In this study we shall try to examine whether mass immigration to Israel caused:

(1) A reduction in the price of labor relative to the price of capital.
(2) A reduction in the price of unskilled labor relative to the price of skilled labor.
(3) A change in the traditional egalitarian wage policy of labor market institutions (i.e., whether unions and the government effectively supported the new market forces).

These hypotheses are based on the following assumptions: (1) there are three factors of production — unskilled labor, skilled labor, and capital

which (2) produce under constant return to scale[3]; (3) complementarity between unskilled labor and capital, where (4) mass immigration brought about an exogenous relative increase of unskilled manpower which (5) resulted in substitution of unskilled for skilled labor. It follows that immigration to Israel reduced the marginal productivity of labor compared with that of capital, and reduced the marginal productivity of unskilled relative to that of skilled labor. Chapter III is devoted mainly to an empirical examination of the development of the labor-capital price ratio, and Chapter IV examines the development of the wage differentials. Chapter V attempts to explain these developments in terms of institutional wage determination and therefore deals with the question of whether labor market institutions were sensitive to the pressure of market forces.

The rest of the present chapter is devoted to a detailed discussion of our basic assumptions — immigration to Israel as an exogenous phenomenon and the relative growth of the factors of production.

2. *Immigration to Israel as an Exogenous Phenomenon*

Not all the changes in the volume of immigration to Israel can be considered as exogenous to the economic system within which we try to explain wage determination. One may argue, for instance, that the end of mass immigration could be easily explained by the same system.[4] But it is much more difficult to supply an endogenous explanation for the genesis and the extent of immigration waves. The following facts might cast some light on this problem.

During the first years of the State many immigrants came from refugee camps, and others immigrated under the pressure of insecurity in their countries of origin. Their transportation and early accomodation in Israel were organized and financed by the Jewish Agency, in accordance with the policy of doubling the population within four years — a policy proclaimed by the first government.[5] In fact, the Jewish population doubled within three

[3] The constant returns to scale assumption does not necessarily ignore possible changes of productivity. We assume that technological change leaves the ratios between the marginal productivity of the factors unchanged. See M. Solow, "Technical Change and the Aggregate Production Function", *Review of Economics and Statistics*, August 1957, 312–20.

[4] This and the following paragraphs are based mainly on the survey "Absorption of Immigrants," *Government Yearbook*, 1956, Jerusalem, 1956, pp. 359–64 (Hebrew); on M. Sicron, *Immigration to Israel: 1948–53*, Jerusalem, 1957, Chapter 3; and on Patinkin, *op. cit.*, chapters 1 and 4.

[5] This policy was ratified by the Knesset (parliament) on March 11, 1949; See *Israel Government Yearbook*, 1950, p. 27 (Hebrew). The legal basis for immigration to

years, 1948–51, and the rate of immigration relative to population in Israel exceeded peak rates in other immigration countries. The occupational structure and the low educational level of many new immigrants were not fitted for the modern economic structure of Israel and constituted serious obstacles to their integration.

Absorption of immigrants was comparatively easy up to the middle of 1949. Most immigrants were until then called to the army, or absorbed in the war economy and in abandoned villages and towns.[6] The rest were temporarily boarded in immigration camps administered and financed by the Jewish Agency, and were withheld from the labor force while in the camps. Although immigration in the period exceeded all predictions, no serious problem of unemployment existed (in the regular labor markets) until mid-1949.

This situation changed radically with the approach of 1950. The average length of stay in the immigration camps had risen during 1949, and the number of inmates reached a peak in August of that year.[7] It was impossible to keep immigrants out of the labor market for long. During the following two years job seekers reached the labor market from three main sources: the demobilizing army; the immigration camps, whose public kitchens were gradually closed and whose inhabitants were transferred to temporary housing near labor markets (so that immigrants were responsible for their own support); and mass immigration which continued until the middle of 1951. During this period, new immigrants were sent to the labor markets shortly after arrival.[8]

Israel is the Law of Return 1950, which permitted practically all Jews to enter Israel. This privilege was established earlier by the Declaration of Independence.

6 The precise extent of the Arab evacuation in 1948 has not been determined. But even according to the estimates of the UN conciliation commission one cannot regard the Jewish immigration to Israel as if it merely replaced the Arab population. See Patinkin, *op. cit.*, pp. 24–25. In particular, the low degree of substitution between Jews and Arabs in the labor markets of mandatory Palestine should be taken into consideration. This was primarily the result of political relations and cultural and economic differences. In the economic literature of the period it was customary to regard trade between the Jewish and the Arab sectors as international trade. See, for example Nathan, Gass and Creamer, *op. cit.*, pp. 4–5 and Chapters 11, 12; L. Gruenbaum (A.L. Gaathon), *National Income and Outlay in Palestine: 1936*, Jerusalem, 1941.

7 "Absorption of Immigrants," *op. cit.*

8 The population of the *ma'abarot* (temporary housing near the labor markets) which was negligible at the beginning of 1950, rose to over 40,000 at the end of 1950, 100,000 in the middle of 1951 and 180,000 at the end of 1951. On the other hand, the population of immigration camps decreased from 100,000 in August 1949 to 40,000 at the end of 1950 and 26,000 at the end of 1951. The population of the work camps (including

In 1950 the government started extensive public and relief works. This helped to reduce unemployment, which was concentrated mainly among new immigrants from Asia and Africa and in the unskilled labor market.[9] In spite of inflationary financing, there was much unemployment. From February 1952, when the government declared a disinflationary policy, unemployment reached serious proportions. The problem was still present at the end of the first decade, but was considerably reduced by 1958–59.

These facts might support the thesis that the genesis, and extent, of mass immigration cannot be explained within the system by which we usually explain wage determination. In order to dispose of this argument and justify its alternative, it would have to be shown that (1) an increased demand for labor in the period under consideration encouraged immigration; it would further have to be shown that (2) the unemployment of the period is not connected with immigration, but results from other factors, such as institutional decisions on wage increases. As we shall see later, the alternative assumption is not confirmed by the available data.

3. *The Rate of Growth of Labor and Capital*

To compare the growth of labor and capital in the period of mass immit gration, we used (1) the estimates of civilian labor force and employmen- prepared by A. Hovne for 1949–59;[10] and (2) A. L. Gaathon's estimates of capital stock.[11] The comparison is presented by Figure 1. One curve repres sents the development of total civilian labor force; a second curve describe- the development of gross capital stock, and the capital-labor ratio is also shown (p. 14).[12]

Let us consider the relevance of these curves to our problems before

transit camps) rose together with that of the *ma'abarot*, from 15,000 in March 1950 to 50,000 at the end of 1951. (*Ibid.*).

9 CBS, LFS, June 1954, pp. 20–25; *Standard of Education of the Population, June 1954*, Special Series No. 66, p. XI.

10 A. Hovne, *The Labor Force in Israel*, FP, Jerusalem, 1961, pp. 12–13.

11 For 1950–59 estimates see A.L. Gaathon, *Capital Stock, Employment, and Output in Israel, 1950–59*, Bank of Israel, Jerusalem, 1961, p. 3. The capital stock estimates for 1949 were kindly made available by Dr. Gaathon. In estimating 1949 capital stock, Gaathon had to make arbitrary extrapolation only for the 1949 discards and depreciation figures. Therefore, the result should be not much worse than the capital stock estimates for 1950 from which the 1949 figures are derived.

12 Capital stock estimates represented in Figure 1 include structures. Omission of structures can hardly change the rate of increase of capital stock during the period of mass immigration, (*ibid.*, Table 1, p. 3). Data for Jewish civilian labor force and for net capital stock appear in Appendix Table C-1. The movement of these two series is very similar to that of the corresponding series represented in the figure.

discussing the 1949–58 capital-labor ratios. Gross capital stock is probably the concept of capital most appropriate for comparing the rates of growth of labor and capital. Gross capital stock is calculated by deducting the discards for each year (instead of annual depreciation, which is deducted to arrive at net stock). The gross concept is thus more appropriate as a measure of the current producing capacity of capital, while the net concept more nearly measures the value of capital as a source of productive services in the present and the future.[13] The gross concept is, thus, a better measurement of capital inputs for short-run wage development analysis.

There is a similar problem of choice between alternative labor force series. The question here is whether to include potential labor force participants in immigration camps, or to consider only persons actually in the labor market.[14] The answer to this question depends on the nature of the problems investigated: if we are interested in a short-run examination of wage developments, the best data for this purpose would be actual employment figures. However, assuming that unemployment declined as a result of its influence on wages (attempting to examine this assumption within the framework of the general model) we can use civilian labor force data for the capital-labor ratio. We would include the people in immigrant camps in the labor force series only if we want to explain within the model institutional decisions in the labor market (such as the arrangements in immigrants camps, in addition to institutional wage decisions). Whatever we choose to do, the assumption behind our choice is that institutions delayed the pressure on wages in the regular labor markets by keeping immigrants in the camps.[15]

Another question is whether to omit from the labor force series 'non-competing groups,' such as minorities and the inhabitants of isolated districts, for the purpose of this comparison in competitive markets. This question is analogous to the previous one: here too institutional barriers to competition in the regular labor markets tended to delay the pressure on wages. The best data for our purpose would therefore be capital stock and labor force estimates for competitive and non-competitive labor markets separately. However, with the available data, the most we can do is to distinguish between Jewish and non-Jewish participants in the labor force, although it can certainly not be said that all Jewish immigrants (including settlers in agriculture) were effectively competing for jobs in the regular markets, and that no non-Jews were seeking jobs in these markets.

13 *Ibid.*, pp. 1–3.

14 People in immigrant camps were not allowed to work while residing in the camps, Hovne, *op. cit.*, p. 17.

15 For a general discussion on regular and non-regular labor markets, see Reder, *op. cit.*

Figure 1 shows that capital stock grew faster than labor force (i.e., the capital-labor ratio rose throughout the period) except in 1949–50. As noted earlier, the year 1950 was the peak year of oversupply of labor according to other sources also. There are no data for the 1948 capital-labor ratio. However, for the rest of the mass-immigration period, 1949–51, all measures except one show a very slight increase of the capital-labor ratio; the exception

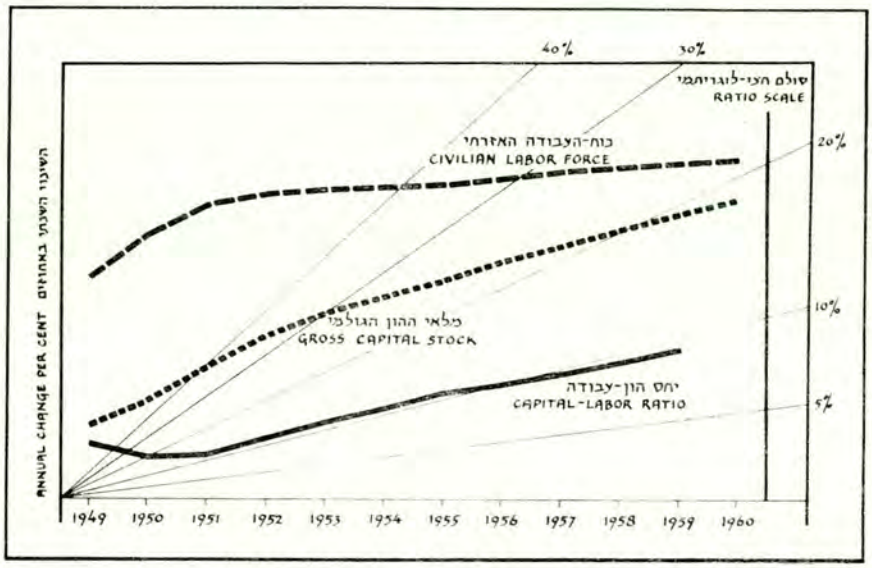

FIGURE 1. *Labor Force and Capital Stock*

SOURCE: Appendix Table C-1.

is gross capital *divided by* civilian labor force, and it is the most relevant measure: from mid-1949 to mid-1951 civilian labor force grew by 26 per cent annually, compared with 22 per cent per annum for gross capital stock for the same period.[16] In this two-year period employed labor force grew by 28 per cent per annum — even more than total labor force.[17] The data

16 Capital stock estimates for mid-year were computed by interpolating beginning-of-year estimates.

17 Cf. Gaathon, *op. cit.*, p. 23, Table 6. Gaathon argues (p. 24) that the capital stock grew faster than employment during 1950–52. However, since 1952 was a year of very low immigration, the employment increase between the middle of 1951 and the middle of 1952 (10 per cent) cannot represent the mass-immigration trends. In fact, between

available also enable us to compare the Jewish civilian labor force with capital stock from the beginning of 1949: from January 1949 to mid-1951, the Jewish labor force grew by 36 per cent, while gross capital stock grew by 21 per cent.[18]

Considering the arbitrary assumptions of the estimates, the rates of growth of labor force, employment and capital stock are subject to errors. An assumption that might greatly affect the results relates to the size of the armed forces in 1951, which Hovne assumed to be 50,000 persons.[19] We have examined the effect on labor force growth-rates of an alternative arbitrary assumption: if we assume that only 25,000 persons were demobilized between the beginning of 1949 and the middle of 1951 (so that in 1951 there were 75,000 in the army) the above mentioned growth-rates would have been smaller by not more than one or two percentage points.

The effect of other possible errors in estimating the growth-rates of capital and labor rates cannot be easily tested. However, the capital-labor ratio declined very little in 1949–50, and correction for errors of estimation might possibly cancel the drop altogether. In addition, workers who arrived in Israel during the mass-immigration period were capable of producing less labor services per manday than the veteran workers, because of the low level of skill and education. It is also possible that the number of working hours per employee was reduced during the period of mass immigration, while the utilization of capital stock rose more slowly than stock itself. For these reasons we hesitate to assert that labor force or employment increased faster than the use of capital stock in 1949–51. But it seems reasonable that in the period of mass immigration Jewish civilian labor force grew faster than did capital stock.

4. *Skilled and Unskilled Employment*

In the absence of separate data on skilled and unskilled employment, this aspect must be studied indirectly — from data on population-growth during the period under investigation, and from a cross-section of the employment structure at the end of the period.

The main source of population increase during the period was mass immigration, which also increased the proportion of Asian and African-born in the population. The importance of these facts is suggested by the low level

the middle of 1950 and the middle of 1951 employment rose by 25 per cent. Therefore any average of these two entirely different periods tends to mask the facts.

18 Jewish civilian labor force for January 1949 was interpolated from November 1948 and mid-1949 data. There are no data for Jewish-owned capital.

19 *Op. cit.*, p. 16.

of education of the new immigrants in general and the immigrants from Asian and African countries in particular, compared to the level of the veterans.[20] This implies a reduction in the general educational level.

TABLE 1. *The Occupational Structure of Jewish Employed Persons by Length of Residence and Continent of Origin: June 1954*

	Thousands			*Per cent*		
	Veterans[a]	*New immigrants*[b]		*Veterans*[a]	*New immigrants*[b]	
		Total	*Asia–Africa born*		*Total*	*Asia–Africa born*
1. Total	**249.6**	**224.3**	**93.2**	**100.0**	**100.0**	**100.0**
2. Unskilled	20.3	52.3	30.5	8.1	23.3	32.7
a. In agriculture	*1.1*	*11.9*	*9.6*	*0.4*	*5.3*	*10.3*
b. In other industries[c]	*19.2*	*40.4*	*20.9*	*7.7*	*18.0*	*22.4*
3. Professional, scientific, technical etc.,	34.3	14.1	3.1	13.7	6.3	3.3
4. Managerial	10.8	2.2	0.4	4.3	1.0	0.4
5. Clerical	42.4	20.9	5.4	17.0	9.3	5.8
6. Salesmen and traders	27.4	21.1	6.4	11.0	9.4	6.9
7. Agriculture[d]	22.8	27.3	15.3	9.1	12.2	16.4
8. Transport and communications	13.6	5.8	1.4	5.4	2.6	1.5
9. Craftsmen, industrial and construction workers	59.5	52.7	17.7	23.8	23.5	19.0
10. Services workers[d]	16.2	23.6	10.7	6.5	10.5	11.5
11. Not known	2.3	4.3	2.3	0.9	1.9	2.5

[a] Immigrated up to end of 1947, or Israel-born.

[b] Immigrated from 1948 on.

[c] In transport, manufacturing, construction and services.

[d] Excluding unskilled.

SOURCE: CBS, *Labor Force Survey, June 1954*, Special Series No. 56, Jerusalem, 1957, pp. 46–47.

Table 1 carries the argument one step further. The table shows that the occupational level of new immigrants (and not only their level of education) was markedly lower than that of the veterans. The occupational level was lower in particular among the new immigrants from Asia and Africa: about 8 per cent of the veteran Jewish employees worked in June 1954 as unskilled workers, compared with 23 per cent of all new immigrants and 33 per cent

[20] Patinkin, *op. cit.* p. 26.

TABLE 2. *The Educational Level of the Jewish Adult Population, by Length of Residence,[a] Occupation, and Sex: June 1954*

	Total		*Did not attend school*		*Did not complete primary education*		*Completed primary education*		*Completed post-primary education*		*Completed higher education*	
	Veterans	*New immigrants*	*Veterans*	*New immigrants*	*Veterans*	*New immigrants*	*Veterans*	*New immigrants*	*Veterans*	*New immigrants*	*Veterans*	*New immigrants*
Men												
All occupations	100.0	100.0	4.1	12.0	22.3	40.8	39.6	31.0	26.8	13.4	7.2	2.8
Professional, scientific, technical, etc.	100.0	100.0	0.2	1.0	3.3	14.6	10.0	11.7	31.6	32.9	54.9	39.8
Managerial	100.0	100.0	1.9	1.9	8.9	19.6	32.0	32.6	43.5	37.1	13.7	8.8
Clerical	100.0	100.0	0.2	0.7	8.5	12.8	30.2	30.1	51.6	47.1	9.5	9.3
Selling and trade	100.0	100.0	5.4	8.3	28.2	38.1	39.4	36.6	24.5	14.9	2.5	2.1
Transport and communications	100.0	100.0	1.7	4.5	21.5	34.7	52.2	42.1	23.0	16.2	1.6	2.5
Crafts, industry, construction[b]	100.0	100.0	3.2	5.8	25.0	40.0	47.1	40.1	23.4	13.1	1.3	1.0
Services workers[b]	100.0	100.0	8.0	10.6	30.7	38.0	40.7	36.1	18.8	14.0	1.8	1.3
Agriculture[b]	100.0	100.0	1.5	14.4	20.8	44.9	42.0	28.7	32.1	11.7	3.6	0.3
Unskilled agricultural laborers	100.0	100.0	2.6	23.0	49.2	59.9	36.7	14.0	11.5	3.1	—	—
Other unskilled laborers[c]	100.0	100.0	12.2	13.8	33.9	47.4	41.9	32.3	11.2	6.3	0.8	0.2
Not in labor force	100.0	100.0	8.2	21.7	30.8	46.2	44.3	25.3	14.2	6.0	2.5	0.8
Women												
All occupations	100.0	100.0	11.8	30.3	18.5	29.2	39.9	27.7	26.1	11.6	3.7	1.2
Professional, scientific, technical, etc.	100.0	100.0	0.2	0.6	2.8	11.5	29.8	26.6	49.2	47.3	18.0	14.0
Managerial	100.0	—	—	—	14.0	—	41.1	—	34.7	—	10.2	—
Clerical	100.0	100.0	—	—	2.7	8.4	37.6	39.0	54.5	44.3	5.2	8.3
Selling and trade	100.0	100.0	5.8	6.8	24.8	28.8	42.4	43.6	22.9	19.8	4.1	1.0
Crafts, industry, construction[b]	100.0	100.0	8.4	6.9	21.8	34.7	47.2	39.9	21.5	17.4	1.1	1.1
Services workers[b]	100.0	100.0	17.8	25.5	29.0	36.0	37.6	25.5	13.4	11.6	2.2	1.4
Agriculture[b]	100.0	100.0	1.9	18.6	12.3	33.7	44.5	30.5	39.4	16.4	1.9	0.8
Unskilled (non-agricultural)[c]	100.0	100.0	15.1	14.2	29.4	35.0	44.4	40.6	11.1	9.4	—	0.8
Not in labor force	100.0	100.0	14.5	34.0	20.7	29.1	40.3	26.8	22.2	9.5	2.3	0.6

[a] Veterans — immigrated before 1948, or Israel-born. New immigrants — immigrated from 1948 on.

[b] Excluding unskilled.

[c] In transport, manufacturing, construction, and services.

SOURCE: CBS, *Standard of Education of Population (June 1954)*, Special Series No. 66, Jerusalem, 1958, pp. 20–21.

of new immigrants born in Asia and Africa. Correspondingly, 14 per cent of the veterans were employed as professional and technical workers, compared with 6 per cent of new immigrants and 3 per cent of the new immigrants from Asia and Africa.

The argument is confirmed by Table 2, which shows that the level of education of new immigrants within each occupational group was lower than that of the veterans in the same occupations. A higher proportion of new immigrants than of veterans lacked primary education, while a higher proportion of veterans than of new immigrants had completed high school and university. It is clear, therefore, that mass immigration brought about an increase of unskilled relatively to skilled employment.

The skill-mix of workers who came to Israel with the second wave of immigration, in 1954–58, could not be examined from the available data. However, it seems reasonable to assume that the skill-mix of these immigrants was better suited to Israeli conditions. Towards the end of 1951 the Jewish Agency decided on occupational and health selectivity with regard to immigrants in certain age groups who wished to receive free transportation and care.[21] The criteria of selection were, however, never applied in all cases, and in the course of time their application was moderated, especially with respect to age and occupation.[22]

It is important to emphasize that even if the skill-level of the second wave of immigration was higher (an assumption which cannot be tested by the available data) certain important tools, including language and other communication patterns, take time to acquire. In the short-run, therefore, immigrants must be considered of inferior skill within their respective educational groups.

As stated, we hesitate to assert that the labor force grew more rapidly than capital stock in the period of mass immigration. But taking into account that unskilled employment grew faster than skilled, it seems reasonable that the stock of unskilled labor rose faster than the capital stock. If, therefore, total labor force did not grow faster than capital stock, the skilled labor force must have grown more slowly. In any event, we expect wages to decline relatively to capital prices. We turn to this problem in the next chapter.

[21] The Jewish Agency, *Dapei Aliya*, (Hebrew), No. 20, Nov. 1952, p. 3; Sicron, *op. cit.* pp. 35–36.

[22] *Ibid.*, pp. 121–122.

CHAPTER III

THE WAGE LEVEL

This chapter attempts to compare wages with various other prices in the period 1948–58. We shall examine the question of whether and to what extent mass immigration resulted in a reduction of the relative price of labor services.

The wage level is influenced by changes in labor service prices. But the wage level is also influenced by changes in the composition of the different kinds of services. The accurate measurement of the average price of labor requires the measurement of wages paid for a basket of services which is kept constant from one year to the next. Yearly measurements of this kind during the whole period would provide us with a chained price index which allows for changes in the weight of labor services and reflects only the changes in their prices.

A chained index of the price of labor services might help us in testing the hypothesis that the relative price of labor was reduced. However, such an index is not available in Israel. We shall therefore make do with certain other indexes, and we shall have to pay attention to the possible bias that might result from their use.

These substitutes — series of wages and earnings — are shown in Figure 2. The first curve in this figure shows nominal average daily wages in manufacturing industry during 1948–58. This index was obtained by linking together three indexes whose base years were 1939, 1951 and 1955. It is influenced by changes in prices paid for labor services in different branches of industry, and possibly also by changes in the average daily number of working hours.

The second curve in the figure represents the nominal average wage for the normal working day (usually eight hours) in all sectors of the economy for the years 1950–58. For our purposes, this index is preferable to the first for three reasons: (i) it describes the wage developments in the whole economy; (ii) it is not influenced by changes in the length of the working day, but only by the changes in effort, in the type of service and in their prices; (iii) it has been obtained by chaining from one year to the next, unlike the

index of manufacturing wages which consists of three indexes linked together. Nevertheless the second index has two major shortcomings: it was arbitrarily constructed for the period 1950–54 (see sources for Table C-2) and it does not cover the most interesting period of mass immigration, 1948–50. For these reasons we must also rely on the other series.

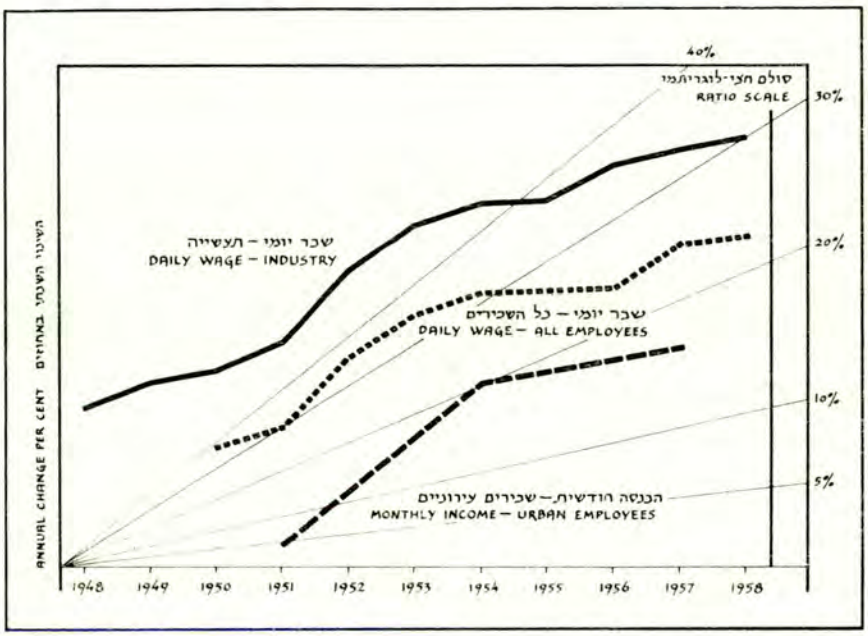

FIGURE 2. *Nominal Wages and Income*

SOURCE: Appendix Table C-2.

The third curve in the figure portrays changes in the average monthly income of urban employees between three points of time — the years 1951, 1954 and 1957. In addition to the factors mentioned above, this index is also influenced by changes in the monthly number of working days of every worker in the family, as well as by changes in their income from property.

As Figure 2 shows, the series of employed family's income and normal daily wages increased less than did daily wages in industry during the second half of the decade. The relatively greater increase of daily wages in industry is explained partly by the rise in the number of working hours per industrial employee, and partly by the fact that in industry wages rose faster than in other sectors.[1]

1 The industrial daily wage index was 152 in 1958 (1954 = 100) compared to the daily

It is difficult to suggest a satisfactory explanation for the differences between the movements presented in Figure 2. Nevertheless, the figure gives some idea of the nominal wage increase over the period: nominal daily wages in industry increased approximately five and a half times, but the rate of increase was not constant, being more rapid in 1952–53 than in the first and the last years of the decade.

1. *Real Wages*

A major explanation for the rise in nominal wages during the ten years is the inflationary process.[2] All price series rose during these years, more rapidly in 1952–53 than in the first and last years of the period. The positive correlation (or the high coefficients of determination) between wages and price series suggests that the rise of nominal wages is mainly due to the nominal price increase of labor, and that other factors were less important. Further confirmation of this assumption is supplied by the cost-of-living allowance agreements which created a direct link between changes in the Consumers' Price Index and the nominal price for labor services.[3]

In the first decade the Consumers' Price Index rose by about 200 per cent, compared with a rise of about 450 per cent in nominal wages in industry. This comparison is shown in Figure 3. The first curve in the figure shows the index of nominal daily wages in industry over the twenty years 1939–58, and the second shows the Consumers' Price Index for the same period. Third, there is an index of real wages which shows that there has been a rising trend from 1942 until the present. If we except the first years of the second world war (1939–41), the one year in which the Consumers' Price Index rose faster than the industrial wage index, was 1948 — the year of the War of Independence, the establishment of the State and the beginning of mass immigration. In 1952 real wages barely increased, a finding borne out by the index of real wages for the whole economy. (See Appendix Table C-3).

The real wage index presented in Figure 3 is not reliable as a measure of the purchasing power of wages in the period. This is mainly because the Consumers' Price Index failed to reflect the true price-rise of the period. During the decade the government carried out a policy of price stability, by subsidizing rationed and controlled commodities. This policy did appar-

wage index which was 146 in the same year, and the index of daily wages for the economy as a whole which was 142 in that year. The two last indexes were computed according to Bank of Israel, *Annual Report 1959*, p. 89.

2 See Patinkin, *op. cit.*, Chapter 4.

3 For a detailed discussion of the cost-of-living agreements see Chapter V, Section 4, and Appendix A.

ently reduce the rate of increase of consumer prices; however, its effect on the index basket was apparently greater than on consumption prices as a whole.[4]

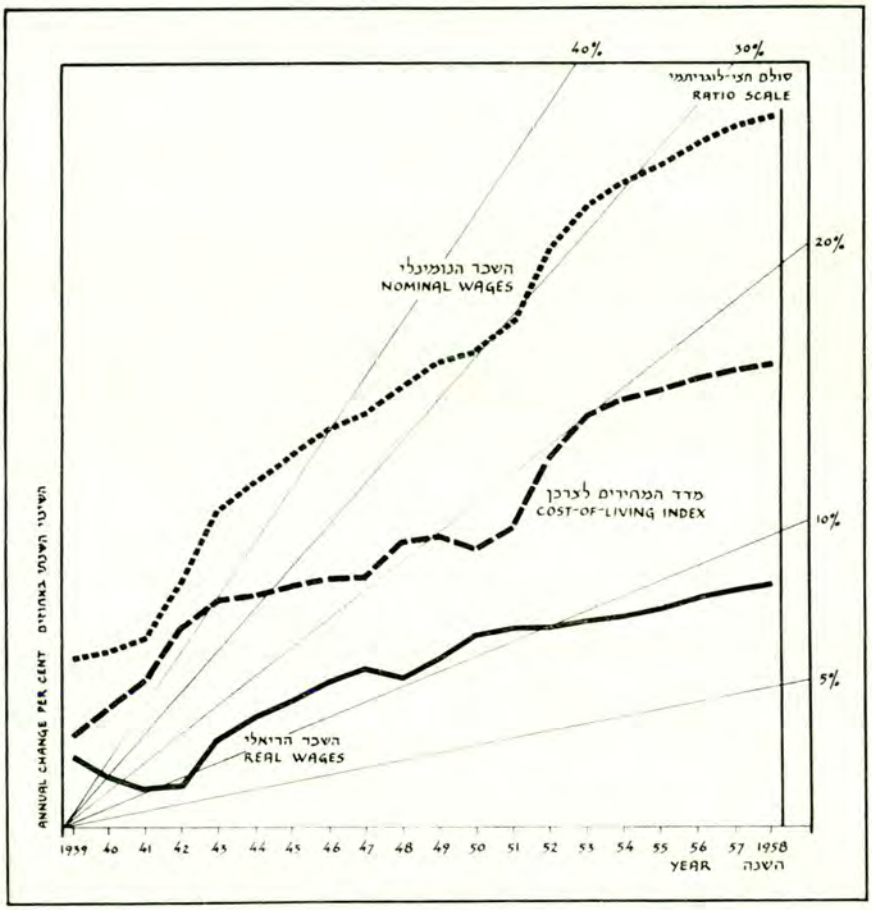

FIGURE 3. *Real Wages*

SOURCE: Appendix Table C-3.

This is particularly true for 1948–51. There was at this time a widespread black market which traded commodities not all of which were included in the official basket used to compute the cost-of-living index until the end of

4 The conclusion follows from three assumptions: (1) relative prices of commodities in the official basket were reduced by subsidies; (2) the weight of the basket in total consumption declined as new commodities appeared; (3) rationing prevented substitution by the cheapened commodities. It is, however, difficult to test these assumptions.

the mass immigration period. It is difficult to obtain quantitative data on the volume of black market trade in these years. The volume probably increased together with excess demand and with the passage of time.[5] On this assumption adequate correction for commodity weights should result in a steady price-rise for the years 1949–51, contrasting with the relative stability of the official price index.

Weighting adjustments are not the only correction which lead to this result. Black market prices, which were not considered in calculating the Consumers' Price Index of the mass-immigration period, rose steadily. It is not however, possible to measure the rise. Data on black prices have been published only for the foreign exchange market. With this information it is possible to estimate the supply prices of imports-without-payment and immigrants' imports which were partly sold in the local black market. Their prices rose in the period of mass immigration.

Owing to the inadequacy of the black market price data and the absence of information on the true consumption weights, we made no attempt to improve the estimates for consumer price movements. But in view of the relative increase of black market prices during the period of mass immigration, the increased volume of goods sold in this market, and the rationing of commodities included in the basket — we conclude that the Consumers' Price Index understates the true price rise of commodities consumed in the period. Hence, the rising trend of real wages which began in 1942 was considerably retarded and perhaps even halted in 1948–1951.

2. *The Relative Price of Labor*

So far we have surveyed real wage developments in Israel from the workers' point of view. However, our main purpose in this chapter is to test developments of the price paid by firms for labor services. For this purpose (i.e., to test the marginal productivity theory as a possible explanation for wage developments in Israel) the Consumers' Price Index is not a useful tool for measuring price changes.

The relevant indexes for computing the relative price of labor are: (1) indexes of the price of commodities sold by firms in the local or the export markets; (2) price indexes for the services of the other factors of production. These are price indexes for variables which appear in the production function. The relative prices of labor or of other factors of production and of

[5] It seems that volume of black market trade was small during the War of Independence when public opinion was effective in eliminating unlawful transactions. Towards the end of the rationing period black market transaction were carried out almost openly.

commodities are expected to change as a result of changes in the volume of the factors.

However, so long as we analyze the changes in the volume of factors which appear in the *aggregate* production function, changes in relative output prices are not meaningful. From the aggregate analysis point of view, the price of output is always unity. Aggregate analysis is our immediate concern, and therefore we focus attention on the price of labor relative to that of capital. The comparison of labor and output prices is discussed later, when wages and prices determined for single firms have been dealt with.[6]

Our immediate purpose, therefore, is to compare labor prices with the prices of the other factors of production during the ten year period. For this purpose, an additional series which measures the prices of a fixed capital-services basket is required. No such data are available, and we therefore make use of the (implicit) price index of equipment, computed from the national accounts data. This index reflects price changes of equipment purchased each year and not necessarily the annual changes in the price of the equipment stock, or of the flow of services of this stock. The equipment price index is therefore a substitute for an index of the price of equipment services: this procedure assumes that the flow of investment services has the same composition as the stock throughout the period.[7]

This seems to be a strong assumption. But it should be stressed that differences in the composition of annual investment and equipment stock can be considered as a source of bias only when relative prices of different types of equipment are assumed to change over time. In view of the comparatively large increase of the absolute level of equipment prices (to be discussed immediately below) relative price differentials of the various equipment categories can probably be neglected.

Figure 4 compares nominal daily wages in industry with the movement of equipment prices in 1943–58. The ratio between wages and equipment prices rose fairly steadily from 1943 until 1951, declined sharply in 1952–54, and rose moderately in 1955–58.

As Figure 4 shows, the ratio between wages and equipment prices reached its peak in 1951. On the base 1951, the ratio was 59 both in 1943 and 1952,

6 See pp. 26–29.

7 Additional factors relevant to price changes of capital services (such as the interest rate) are treated on pp. 26–27. In taking prices of equipment as indicators for capital service prices we have neglected investment in the structures which are necessary for using the equipment. However, the price index for structures followed trends similar to the equipment price index, although its movements were more moderate. Combining the two indexes into one, taking any arbitrary weights, can hardly affect our argument.

52 in 1953 and 46 in 1954. The small rise during 1955–58 brought it to 57 in 1958 (or to 68 for 1948 = 100). The ratio was also lower at the end of the first decade than in 1943.

As seen, the price of labor relative to capital declined considerably over 1948–58. This finding accords with the hypothesis stated in the previous

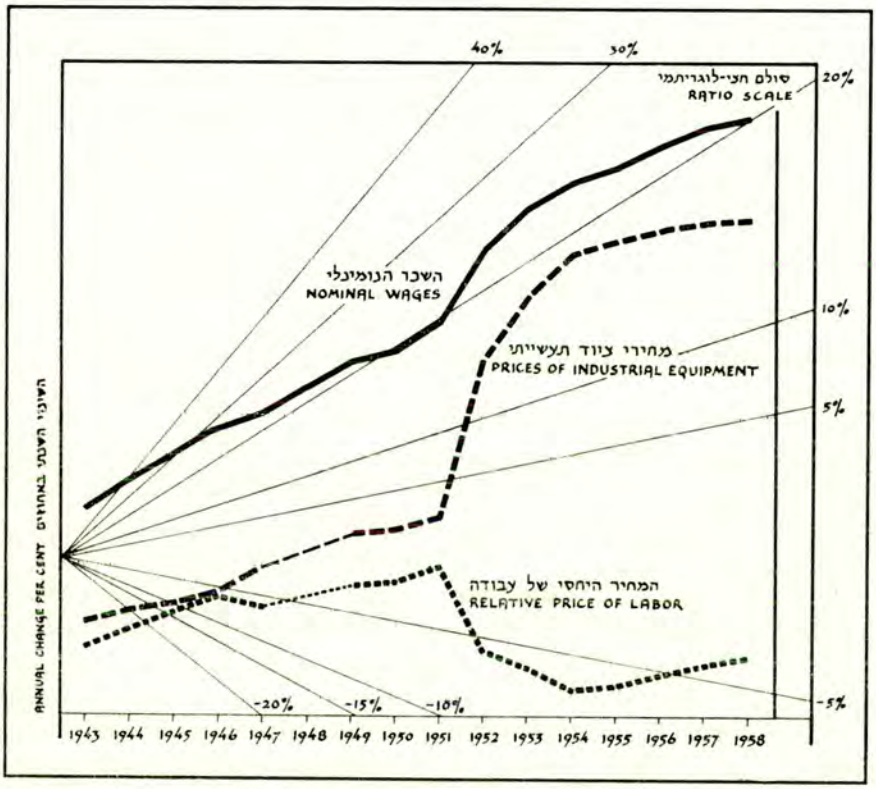

FIGURE 4. *Wages and Equipment Prices*

SOURCE: Appendix Table C-4.

chapter. However, the decline occurred after the mass-immigration years. The downward movement began in 1952, almost a year after the end of heavy immigration, and the rise in 1955 occurred four years after the capital-labor ratio began to rise.

It is, however, difficult to explain the lag in the decline in relative labor price by the existence of black markets for equipment in the period of mass immigration. In a small country industrial equipment tends to be specific

for any plant, so that local markets for equipment are rare. Nevertheless, in view of the rationing of equipment in this period, the value of equipment could, from the firm's point of view, have been greater than indicated by prices actually paid — i.e. the prices reflected in the national accounts. This possible explanation of the lag in price-decline leads us to a more general discussion of the development of equipment prices from the firms' point of view.

The equipment price index presented in Figure 4 reflects the price of equipment imported from the United States in 1950–54 and from Western Germany in 1954–58, as well as changes in the foreign exchange rate that took place at various times during the period. The sharp rise in equipment prices in 1952–54, and particularly in 1952, resulted mainly from the depreciation of the Israel pound in these years. In this way the government faced firms with higher prices for imports in general and for equipment in particular.

The index of equipment prices does not, however, take into consideration the subsidies, grants and other benefits granted by the government to purchasers of equipment. The question therefore arises: what, from the firm's point of view, was the effect of the subsidization policy on equipment prices? Did the government hold back equipment price-rises throughout the ten-year period? It is important to emphasize that we are not now considering the extent of subsidization at any point in time, but the changes in it during the period. A higher rate of equipment subsidization at the beginning than at the end of the period means that over the years equipment prices effectively rose as a result of the change in government policy.

We do not have enough data to measure the influence of the government on equipment price movements from the firm's point of view. However, some facts listed below might cast light on the matter:

(a) At the beginning of the period, loans were granted to investors by a mostly inexperienced government staff. Sufficient measures were not always taken to secure repayment. Later on, the administration of loans was transferred to the large commercial banks in the country, which were supposed to be more efficient in securing repayment. From the average investor's point of view this change constituted an increase in the price of loans.

(b) The annual rate of increase of the general price level, including prices of equipment, declined during the period. Thus the incentive to run from money and the speculative incentive to invest in equipment in particular diminished over time. Moreover, towards the end of the period, loans from the Development Budget were linked to the exchange rate (or the Consumers' Price Index).[8]

8 *Government Yearbook 1959*, p. 55 (Hebrew); Bank of Israel, *Annual Report 1956*, p. 311, note 2.

(c) The interest rate for the American loans granted to investors at the beginning of the period by the Export-Import Bank was 4–5 per cent, compared to 7.5 per cent which was the average interest rate for Development Budget loans granted at the end of the period.[9] During the decade the maximum legal rate of interest was raised from 9 to 11 per cent, and a significant rise in interest rates occurred also in the black loans market.[10]

(d) There are no data for computing the government's share in financing purchases of equipment; however, government-financed capital formation as a percentage of total gross domestic capital formation declined during the ten-year period, particularly from 1954.[11]

The decline in wages relative to the market prices of equipment in 1952–54 describes, therefore, only part of the relative reduction in the price of labor from the individual firm's point of view. The relative price of labor declined further as a result of the above mentioned changes, which are not reflected in the national accounts.

An additional factor that should be discussed when the relative labor prices are considered from the firm's standpoint is the price of output sold by the firm in the local and export markets. Changes in these prices too, and not only changes in input prices, affect the quantity of labor demanded by the firm. The question to be discussed now is, therefore, how commodity prices have moved compared with the price of labor.

3. *Labor and Product Prices*

When national product is measured at factor cost, national product prices are by definition a weighted average of the prices of the factors of production. If we assume that labor prices rose less than the prices of other factors we may conclude that the average product price rises faster than that of labor.

This is not to say that product prices in every industry should rise faster than the average price of labor. It seems reasonable to expect a smaller relative rise in product prices in industries in which (1) demand elasticity for output is lower, and (2) output elasticity with respect to labor inputs is higher (than in other industries). A further implication of our model is a decline in relative output price in industries whose market is geographically restricted (especially service industries) compared with industries whose market is wider, and the elasticity of demand for whose product is higher.

9 Bank of Israel, *Annual Report 1957*, p. 61; *Annual Report 1956*, p. 311.

10 Bank of Israel, *Annual Report 1955*, pp. 199–200; *Annual Report 1956*, pp. 310–311; *Annual Report 1957*, p. 182; *Annual Report 1958*, p. 180.

11 Patinkin, *op. cit.*, Table 31, pp. 86–87.

Since no price indexes for the product of the various industries are available, it is difficult to test these hypotheses systematically. The most we can do is to use the data on import price developments and the exchange rate for the added value of exports as crude indicators for the price movements of import substitutes and exports. The procedure is subject to the following reservations.

The price index of imports does not necessarily measure the changes in the prices of locally produced import substitutes. Inasmuch as relative prices

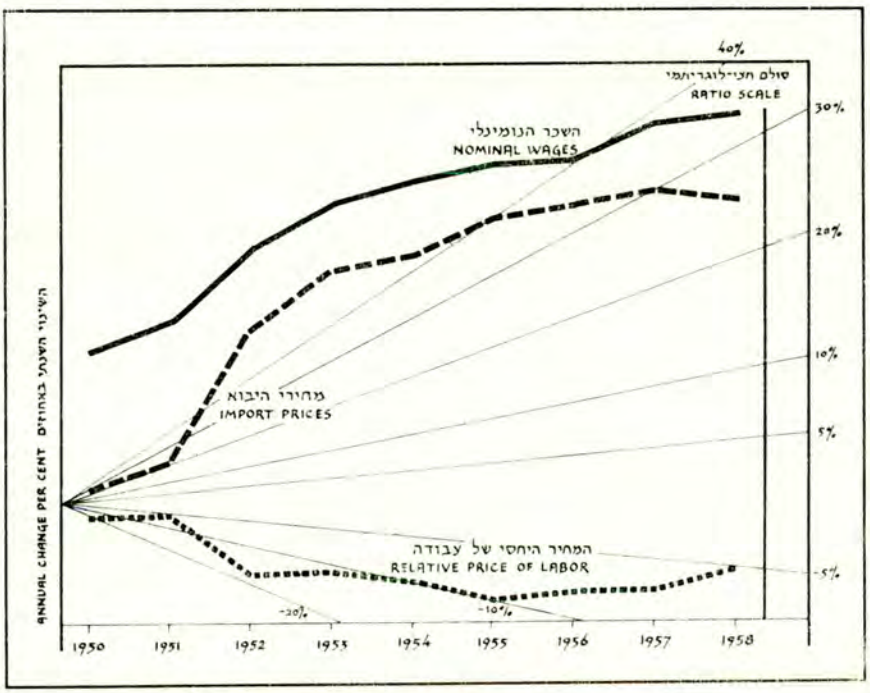

FIGURE 5. *Wages and Import Prices*

SOURCE: Appendix Table C-5.

of the various import commodities changed during the period, and inasmuch as weights of the import commodities in the index are different from the weights of import substitutes — it is not possible to infer from one price index to the other. But if we assume that changes of relative price among import commodities were small compared with the large rise in the overall level of import prices during the period, we may get some idea of the development of import substitute prices from the index of import prices.

Another more serious difficulty is that the available import price index

does not fully measure changes in the local import prices, but changes in the international prices of the import basket, together with changes in the exchange rate of the Israel pound. If we assume, therefore, that changes in the exchange rate lag behind (or precede) actual market developments we cannot rely on the import price index as an indicator of yearly changes in import substitute prices; at most, the index is valid for long periods. The import price index seems to overstate the 1950–52 price rise, while it seems to understate the 1954–58 price increase.[12]

Figure 5 Compares nominal daily wages in industry with import prices over 1950–58. The figure shows that the ratio of nominal wages to import prices declined considerably in 1952. As mentioned, the yearly movements of the import price index are not reliable. But in view of the general picture — from 1950 to 1958 wages rose approximately four and a half times while the import prices rose approximately six times — it seem reasonable to conclude that the price of labor, relative to output prices in import substitute industries, declined significantly during the period.[13] There are not sufficient data on output price developments in the export industries to enable us to generalize the conclusion to the exporting industries. But according to the data on the exchange rates for added value of exports (which rose during 1948–58 approximately eight times[14]) such a generalization seems plausible.

Again, these findings tell us nothing about the development of wages and output prices in the other industries. The fact that national product market prices rose only about three times in 1950–58 makes it not improbable that opposite developments occurred in some other industries.

4. *Prices of Labor and Professional Services*

Until now we have compared changes in the wage level in industry with the prices of consumption, equipment, and imports and exports. Another comparison which is worth making with the available data is with the price of professional services. This comparison brings us closer to the problem of wage differentials, the subject of the next chapter.

Figure 6 presents nominal daily wages in industry together with nominal annual income of salaried graduates, for 1948–57.[15] The ratio of the professional employee's income to industrial wages is represented by the third

[12] *Ibid.*, p. 46. [13] Cf. *ibid.*, 123–124.

[14] *Ibid.*, pp. 121–123.

[15] The income index of salaried graduates was computed by R. Klinov-Malul from a sample of income tax files. The index reflects changes in gross annual income, before deductions. The annual income is preferable to, say, monthly income as a measure of professional services prices because a year is a reasonable unit of time for hiring

curve. This ratio rose throughout the period by about 65 per cent. While nominal daily wages in industry rose about five and a quarter times, the nominal annual income of the professional workers rose about eight and a half times.[16] The *relative* price of professional services rose each year during the period of mass immigration, 1948–51, and at the time of the second wave of immigration. In the intervening period, 1952–53, it declined steeply.

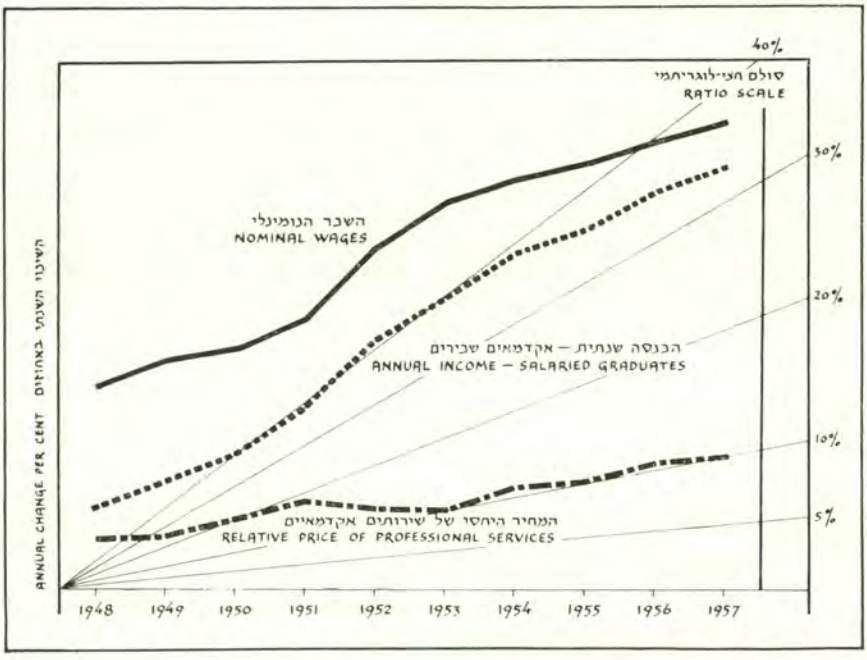

FIGURE 6. *Daily Wages in Industry and Professional Salaries*

SOURCE: Appendix Table C-6.

The results of the comparison on the whole fit the hypothesis discussed in the preceding chapter. Prices of the relatively scarce services (capital or professional services) rose relatively more than those of more plentiful services

such services. Analysis of professional salaries by age shows that the rise in income shown by the curve is somewhat overstated, as a result of using a fixed basket of professional services. The bias is not, however, of sufficient magnitude to affect the conclusions emerging from Figure 6.

16 It should be emphasized that this comparison tells us nothing about relative income developments of the two groups. The number of working days during the year in the industrial group may have changed.

in the period as a whole. But in examining the relative movements of wages and income from year to year, we find changes which do not always correspond to our theoretical expectations. Among these, the downward movement of the relative price of professional services during 1952–53 should be emphasized. Also, the fact that the agreement on cost-of-living allowances worked towards narrowing relative wage differentials in the years 1952–53[17] does not leave much place for doubting the reliability of the relative income decline of professional employees in these years.

[17] See Chapter V.

CHAPTER IV

THE WAGE STRUCTURE

In the present chapter we deal with changes in wage differentials in 1948–58. Starting with a general discussion of wage structure measurements, and an examination of the available data, we shall go on to discuss whether and to what extent mass immigration brought about a reduction of the relative prices of unskilled labor services.

We would like to measure the wages of groups of workers that are homogeneous with respect to the labor services performed. Within each group, the marginal productivity of labor would be the same for all workers. Wage differentials among these groups reflect differences among prices of labor services. Changes of the wage ratio between any pair of groups reflect changes in the relative prices of labor services in the economy.

If our aim is a high degree of homogeneity within each group of workers, the customary (arbitrary) classification into 'skilled' and 'unskilled' laborers is far from satisfactory. Instead, we should attempt to divide the workers according to the marginal productivities of the labor services performed, and measure wages for each group separately.

If workers are grouped in this way, the problem of eliminating the effects of possible weight changes on the wages of each group is no longer important.[1] On the other hand, such grouping raises a problem which we did not meet in our discussion of the wage level in the previous chapter. In analyzing wage level developments we compared pairs of price series — an average price for labor services on the one hand and some other average price on the other. These comparisons were based on the (implicit) assumption that random errors of wage and price observations do not affect both averages. On this assumption we could attribute a definite economic meaning to the comparison.

Quite different is the case where many relative labor prices are to be investigated. The economic theory of mass immigration, from which we adopted the hypothesis concerning the relative reduction in the unskilled

[1] See above, p. 19.

labor prices, does not specify the particular expected behavior of every price ratio between (all possible) pairs of labor services, but determines the development of relative labor prices generally. Like any other economic reasoning, it implies developments expected to be true on the average, and not necessarily in particular cases. The additional problem we now face is to find the proper index for this general (or central tendency) development of relative labor prices.

1. *Measurements of Wage Differentials*

Empirical studies on movements of wage differentials over time use measures of relative wage dispersion (coefficients of variation, such as the interquartile range divided by the median, the standard deviation divided by the mean, the logarithmic standard deviation, etc.) as indicators of changes in relative wage differentials or relative labor prices.[2] The question arises which of the measures is relevant to the particular problem in hand.

Suppose we want to measure changes in wage differentials among n homogeneous groups of workers. Our aim is to find out whether and by how much wage differentials at one period were, on the average, wider (or narrower) than the corresponding wage differentials at another period. A simple method that might be suggested for the purpose of this investigation is to compare averages of wage differentials computed independently for each period.[3] This comparison would provide us with estimates for central tendency changes in wage differentials over time.

The set of differentials for which these averages are to be computed should, however, be defined at the outset. The definition follows from the nature of the problem. Let us assume for a moment that the ranking of wages of the n groups of workers is determined by the ranking of the marginal productivities of the corresponding labor services. On this assumption, unskilled

[2] See, for example, P.G. Keat, "Long Term Changes in Occupational Wage Structure, 1900–1956", *Journal of Political Economy*, Dec. 1960, 584–600. Changes in supply and demand for different kinds of worker are expected to influence relative prices of labor. Therefore, when a downward movement of relative wage dispersion is explained by the growth of education, and when an increase of relative wage dispersion is explained by unskilled immigration, it is implicitly assumed that changes in relative dispersion of wages are indications of changes in labor prices.

[3] An alternative approach is to compute averages for the *changes in the individual differentials*, instead of comparing averages of differentials computed independently for each period. This is the approach in my "Wage Differentials and Specification Bias in Estimates of Relative Labor Prices," *Review of Economics and Statistics*, November, 1962, reissued as FP Research Paper 14, July 1963. However, after defining the relevant set of wage differentials, this approach leads to the same method of computation.

immigration (i.e. an increased supply of labor services of relatively low productivity) is expected to reduce the prices of the lower-paid services relative to the prices of the higher-paid services. Therefore, the set of differentials in any period might be defined as all possible positive differences between the wages of the *n* groups of workers. The arithmetic mean of these differences (*multiplied by* a constant) is equal to the average deviation (the sum of the absolute deviations of wages from their mean *divided by n*). The arithmetic mean of the squares of these differences (*multiplied by* a constant) is equal to the variance of wages, the square root of which is the standard deviation.

However, there is a difficulty in using these measurements of standard or average deviation for wage structure analysis. It results from possible changes over time in the ranking of wages, which raise an identification problem with regard to the relevant set of wage differentials. For different wage rankings determine different sets of wage differentials. And while mass immigration is expected to increase the 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 determined by the ranking of wages in each of the periods.

Once again, the economically meaningful set of wage differentials for our problem is that based on the ranking of marginal productivities. Our purpose is to find out whether and by how much prices of the higher-productivity labor services rose, on the average, over the prices of the lower-productivity services as a result of lower-productivity labor supply increase. Therefore, assuming for the moment perfect correlation between the wage and productivity rankings, so that changes in the wage ranking reflect changes in the ranking of the marginal productivities, the relevant set of wage differentials is that of a base period, e.g., the year before the beginning of immigration. On this assumption, the standard (or average) deviation could be applied only to the average of differentials in the base period, while the right measures for the other periods are averages of the same set of differentials (of the base period) in other periods. The comparison of these averages of differentials could tell us what happened to the original set of wage differentials during the years of mass immigration.

However, changes in the wage ranking do not necessarily reflect changes in the marginal productivity ranking. To the extent that there is substitution and competition among groups of workers, there is not much reason to expect changes in the marginal productivity ranking. For if we assume substitution and effective competition, a relative supply increase of a skilled

labor group (as well as a relative reduction of demand, or a technological change) should seldom cause the marginal productivity of a skilled service to fall below that of an unskilled service. On these assumptions, the skill differential might diminish, and perhaps almost vanish, but will not usually become negative.

An alternative explanation for changes in wage ranking could be easily provided by assuming discrepancies between wages and marginal productivities at each point of time. While wages are believed to measure the marginal productivity of labor services in the *long run*, they should not be expected to equal marginal productivities in any given year. Furthermore, there are good reasons for distinguishing between wages as actually measured and the theoretical concept of 'labor prices'.[4] These labor prices, and not necessarily wages, tend (under competition and in the long run) to equal the marginal productivity of the labor services.

This alternative explanation for changes in the wage ranking entails the possibility of error in specifying the set of wage differentials which is relevant for our problem. For if discrepancies between wages and marginal productivities in the base years are sufficiently large, there may be discrepancies between the wage and productivity rankings of these crucial years. In that case, and to the extent that the wage productivity discrepancies are due to independent random errors in all years, wage differentials will tend to be wider than productivity differentials in the base years, and wider in the base than in the other years.[5]

4 *Ibid.*

5 These conclusions can be demonstrated as follows: Suppose we start from a given set of base year productivity differentials and allow for equal probabilities of wages to be larger or smaller than their corresponding productivities, so that the average of productivity differentials is equal to the average of wage differentials. Now, consider one particular wage differential, which happens to be smaller than its corresponding productivity differential in the base year. This wage differential could even be negative if correctly measured, but it will never be recorded as negative according to our specification of wage differentials. Instead, it will be taken by us as a positive ("misspecified") differential. Therefore, our computed average of wage differentials for the base year will tend to be larger than its corresponding (hypothetical) average of productivity differentials.

Furthermore, let us assume equal probabilities for wages to be larger or smaller than their marginal productivities in the following year as well, independently of the corresponding discrepancies in the base year. On these assumptions, the above mentioned negative differential (if correctly measured) will tend to increase in the direction of the following year. However, since it was misspecified as a positive differential in the base year, it will be recorded by us as if it were reduced in the direction of the other year. Therefore, if productivity differentials were, on the average the same in

However, this assumption of independent random discrepancies between marginal productivities and wages could be used in constructing an estimate for the correctly specified set of wage differentials. For if wage-productivity discrepancies for a group of workers for several years are not correlated, the average of wages for the group in that period is an estimate for the corresponding average of marginal productivities (of the same group in the same years). Similar estimates for the averages of marginal productivities in the same period can be computed for each of the other groups of workers. Thus, assuming constant productivity ranking through time (i.e., assuming that no group of workers changed its rank order in the productivity array during the period), the ranking of the average wages of the groups provides us with an estimate for the productivity ranking of the groups of workers in this period. According to this *average ranking* of wages (as distinct from an arbitrary base year ranking) the relevant set of wage differentials will be specified, and central tendency measures of the 'correctly specified' wage differentials will be computed for each year.

The measure of wage differentials we have chosen to employ in this study is the arithmetic mean of all possible (positive or negative) differences between the wages of 'higher-paid' and 'lower-paid' groups of workers, where the terms 'high' and 'low' pay are determined for each pair of groups of workers according to the place they take in the average ranking.[6] This

both years, the computed average of wage differentials will tend to be larger in the base year than in the following year. For a systematic treatment of this subject, see *ibid.*

6 The algebra of this measurement (fully developed in *ibid.*) is not difficult to follow: Let X_{it} ($i = 1, 2,..., n$; $t = 1, 2,..., T$) denote a matrix of wages for n groups of workers in T years, and let z_i denote the average ranking for group i, which is determined by the rank order of the sum $\sum_{t=1}^{T} X_{it}$. The total sum of all 'correctly specified' wage differentials in year t is given by $\sum_{z_i=1}^{n} \sum_{j=z_i+1}^{n} (X_{z_i} - X_j)$, and the ratio between the arithmetic means of differentials — year $t+1$/year t — reduces to the simple expression $\dfrac{\sum_{i=1}^{n} z_i x_{i,t+1}}{\sum_{i=1}^{n} z_i x_{it}}$, where $x = X - \bar{X}$.

serves our purpose better than the alternative measures because it is closely related to a relevant set of productivity differentials (unlike dispersion measures) and yet is not based on an arbitrary specification of this set (as regression measures are). Our measure tells us whether, and by how much, prices of the higher productivity labor services (as measured by the average ranking) rose, on the average, over prices of the lower productivity services.

This measure of wage differentials (or relative labor prices) depends, however, on assumptions that require empirical support. For the purpose of productivity ranking determination, a number of years for which it is reasonable to assume constant productivity ranking should be chosen. However, the real difficulty is to corroborate the assumption of independent random discrepancies between wages and marginal productivities. In fact, one can accept such an assumption when the only source for wage-productivity discrepancies is the error of employers and workers in estimating labor productivity and the alternative returns of workers in other firms. In this case, imperfect competition is assumed to exist only because of the lack of complete information.

The hypothesis of independent random discrepancies therefore requires an extreme assumption to be justified: the absence of constant monopolistic and monopsonistic power in actual wage determination processes of specific groups of workers. However, our measures do not depend entirely on this assumption. It is sufficient to assume that monopolistic or monopsonistic power in wage determination is not strong enough to create discrepancies between productivity and the average wage rankings. In any case, we did not test these assumptions directly. Instead we examined the operational

This expression is, however, an index number for deviations of wages from their mean, where the average ranking serves as weight. The use of logarithms instead of X_{it} enables us to investigate *relative* wage differentials by means of the same index.

For comparison let us formulate accordingly some other measures which are frequently used for wage structure analysis. The average deviation measure could be written as

$$\frac{\sum_{i=1}^{n} z_{i,t+1}\, x_{i,t+1}}{\sum_{i=1}^{n} z_{it}\, x_{it}}$$

where $z_{i,\,t+1}$ denotes the ranking of wages in year $t+1$ and z_{it} denotes the ranking of wages in year t. The standard deviation measure merely replaces $z_{i,t+1}$ and z_{it} in the above formula by $x_{i,t+1}$ and x_{it} respectively. The regression measurement replaces them both by $x_{i,t+1}$ when the base year is $t+1$ and by x_{it} when the base year is t.

validity and consistency of the working assumptions within a general estimating model.[7]

2. *The Available Data*

The best data we have are annual averages of daily wages for 12 industries in 1939–51 and for 16 industries in 1955–58, published by the Jewish Agency and the CBS, together with the industrial wage index. These averages by no means cover homogeneous groups of workers. Moreover, comparable indexes of average industrial wages have not been published for 1952–54, and a change in the sample in 1955 bars comparison of the data for 1955–58 with the corresponding data for 1939–51.

The use of these statistics for our purpose raises serious doubts as to the interpretation of empirical results based on *any* measure of wage structure. It is true that industries differ from one another in their skill-mix, job content and structure, so that a low-wage industry (an industry which appears at the bottom of the average wage ranking) could be regarded as employing workers of lower average marginal productivity than a high-wage industry. But the average of marginal productivities in any particular industry could be altered over the years through changes in the skill-mix and job-structure, which, in extreme cases, might also change the industrial productivity ranking. Also, changes in the skill-mix within industries might change their average wages and therefore influence all kinds of wage structure measures regardless of any connection with the movement of labor prices of homogenous groups.

However, inasmuch as skill-mix changes are not systematic, they should not bother us too much. In that case, we might assume the existence of additional types of 'random' discrepancies, i.e., independent deviations between 'normal' and actual average marginal productivities and between 'normal' and actual average wages in each industry. These kinds of random discrepancy do not alter our previous discussion because they tend to be averaged out in the computations of both the average ranking and the averages of wage differentials.

But not all skill-mix changes can be regarded as unsystematic. Workers might move from one industry to another as well as into and out of the industrial sector as a result of a 'systematic' desire to improve their economic standard.[8] If the wages of the moving workers were always equal to the average wages of the industries they leave and enter, no change of the

[7] See Bahral, *op. cit.*

[8] The change in the workers' own wage should not bother us in this context. This is only a reflection of the general problem of productivity-wage discrepancies discussed

industrial wage averages and therefore, no bias in our estimates of wage differentials would result from these movements. But the problem of a possible bias exists where the average wage of the workers who move into or out of an industry is not equal to the average wage of the industry.

The systematic factor, which works for mobility, is, however, the difference between the offers made to the *individual* worker by the relevant industries, which has nothing to do with the difference between the average wages in these industries. Therefore, it is reasonable to assume that mobility tendencies are independent of the relative wages of the workers in the industry they leave or enter. On this assumption, the *expected* average wage of all movers into or out of an industry, is equal to the average wage of the relevant industry.

No bias in our estimates of wage differentials, is, therefore, assumed to exist as a result of normal mobility. But another type of systematic change in the skill-mix and job structure — the 'exogenous' factor which results from possible technological changes and so forth — should be noted. It is, however, practically impossible to make any assumption about the average tendencies of such exogenous factors, and therefore it is difficult to analyze on an *a priori* basis the direction and extent of possible biases in our wage differentials estimate. For this reason, and in order to test the validity of our previous assumption on normal mobility trends, an empirical test of the relevance of the data to our problem is required.

The hypothesis of changes in the skill-mix that could have changed industrial wage averages (and that could therefore result in a bias in our estimate of wage differentials) has one implication on which we may base our empirical test: if skill-mix changes actually influenced the industrial wage averages, we would expect to find changes in the frequency distributions of wages. These distributions are usually described very closely by the log-normal graph, and if the above-mentioned skill-mix changes actually took place, we would expect to find their impact on the tails of the distributions.

We therefore examined frequency distributions of industrial wages for some years during 1943–48 and 1949–53, based on wage surveys carried out and published by the Jewish Agency, the Histadrut and the CBS.[9] Relying on these sources, we can say that no substantial or systematic change in

above. It is the effect of weight changes on the industrial wage averages that we are now examining.

9 G. Cyderovich and D. Gurevich, *Investigation into Workers' Wages and Earnings in Jewish Industry, 1943*, Jerusalem 1945 (Hebrew); Histadrut, *Survey of Wages in Industry, 1948* (and the same Hebrew publications for 1949 and 1950); CBS, *Statistics of Wages in Industry: August 1952*, and *Statistics of Wages: 1953–54*.

the general form of wage distribution took place during the period. Wage distributions for the period of mass immigration could be described effectively by the same log-normal curve as the corresponding distributions of previous years. To the extent that we found deviations between theoretical and actual distributions, these occurred equally in all periods, and did not seem to be correlated with the wage ranking of the industries.[10]

These findings do not give us too much confidence in the accuracy of the estimates of wage differentials to be presented in the next section. The use of substitutes for the relevant occupational wage statistics should increase the variance of our estimates by introducing irrelevant factors that can be expected to average out only in large samples. On the other hand, the results of the test for stable forms of distribution confirm the hypothesis that our estimates are not biased to one side or the other.[11] We can turn now to changes in wage differentials in the industrial sector of the economy.

3. *The Results*

The computation of our estimates of changes in relative wage differentials first entails an estimation of the ranking of the marginal productivities. In the absence of information on possible changes in the marginal productivity ranking of the industries it was difficult to choose the periods from — and for — which the average productivity ranking was to be determined. Examining the raw data of average industrial wages, we did not find many changes in the ranking of wages for most industries during 1939–45, 1949–51, and 1955–58. For this reason we began with these sub-periods.

An exception to this rule was the diamond industry in the years of the second world war; in the early years of the war (1939–40) average wages in the diamond industry were about 40 per cent of average wages in other industries; and after a sharp rise during 1941–43, they reached, in the years 1944–46, a level of about 150 per cent of the general average.

[10] Alongside these stable forms of wage distributions we also found significant negative correlations between employment increase (of mandays) in the period of mass immigration and the wage level of the industries. Corresponding computations for years other than those of mass immigration (during 1939–47) sometimes showed positive or negative correlations, none of which was statistically significant. The sources for computations are those given for Table C-7.

[11] It should be borne in mind that our estimates of wage differentials relate to a wage structure different from the so called occupational wage structure. However, different estimates for the occupational wage structure itself would probably be obtained on the basis of different definitions for 'occupations'. Central tendency measurements for changes in differentials should, therefore, be explicitly related to a well-specified wage structure, which is in our case, the so-called 'industrial wage structure'.

This extreme behavior in diamond wages is explained by the human investments made during the industry's early years in Palestine.[12] The ranking of the marginal productivity of labor in diamond enterprises is assumed to change (probably from year to year) during most of the war. For these reasons we omitted diamond wages from the ranking and other computations for the years 1939–45.

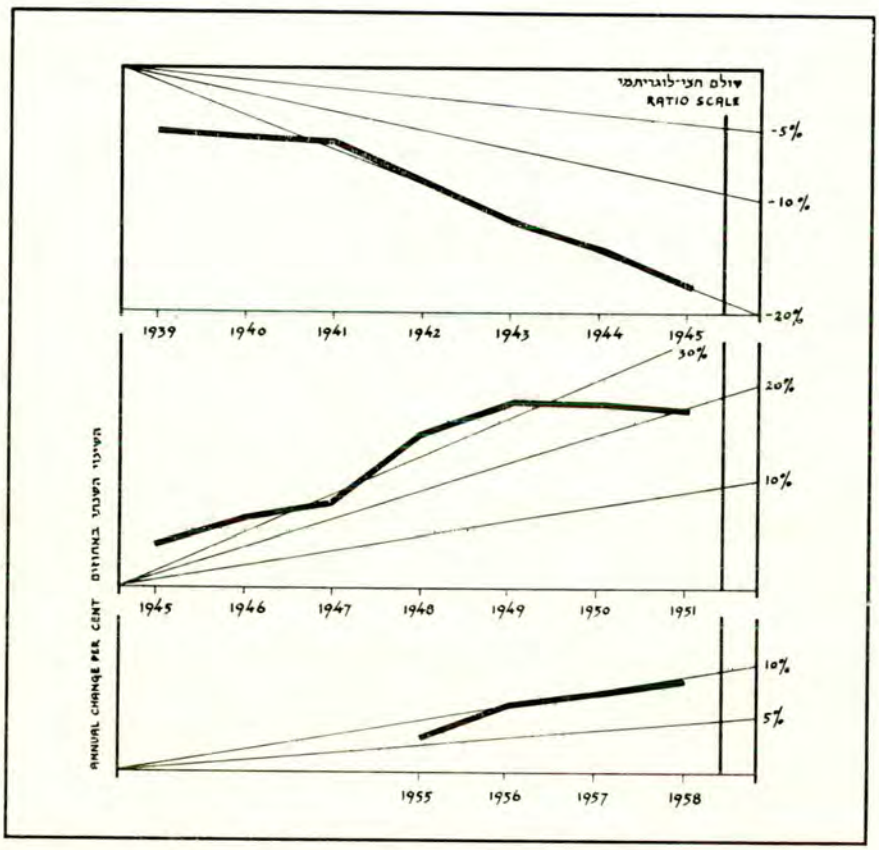

FIGURE 7. *Relative Wage Differentials in Industry*

SOURCE: Appendix Table C-7.

12 The industry was established by entrepreneurs who escaped from the Netherlands and Belgium before and during the first years of the war. The new factories employed apprentices and on-the-job trainees paid on a piece-rate basis, whose income (as beginners) was very low, compared to incomes in other industries. See the Jewish Agency, *Alon Statisti*, Vol. I, No. 1–6, pp. 66–67; Vol. II, No. 1–6 p. 51; and *Wages in the Diamond Industry*, 1944, Jerusalem, 1955, p. 45 (Hebrew).

The sub-periods 1939–45, 1945–51 and 1955–58 were quite arbitrarily chosen for the ranking computations. This limits the use of the ranking for eliminating the 'specification bias' in the estimates of the wage differentials. The decision is partly justified by the fact that 1945 was the last year of the war, and also the last year in which relative wage dispersion declined.

However, an attempt was made to test the effect of using other sub-periods on the average ranking of wages. Generally speaking, no substantial changes in ranking were found as a result of arbitrarily using other sub-periods. In some cases (where the average ranking seemed to be dependent on such arbitrary decisions, and where it was not significant) alternative estimates for the change of relative wage differentials were computed on the basis of alternative rankings. The results of these computations were quite similar to the original estimates. The reason for this is probably that changes in rank happened more frequently between wage rates that were closer to the general average and to one another.

Estimates of changes in relative wage differentials are given in Figure 7 for each year during 1939–45, 1945–51 and 1955–58. The base years for the computations on which Figure 7 is based were taken as 1943, 1947 and 1955. However, since our measure of wage differentials satisfies the time reversal test, this arbitrary choice of base years does not affect the estimates.

Figure 7 shows: (a) the narrowing of relative wage differentials which took place during the second world war in 1941–45 (and from 1941 to 1942 in particular); (b) the slow widening of relative wage differentials during the post-war period 1945–47; (c) the rapid widening of relative wage differentials between 1947–48 and 1948–49; (d) the more or less stable (but high) level of relative differentials 1949–51; and (e) the steady widening of relative wage differentials during 1955–58. Compared with 1947 (=100), relative wage differentials were 77 in 1945, 221 in 1939, 156 in 1948 and 190 in 1950. Compared with 1955 (=100), relative wage differentials were 120 in 1956, 132 in 1957 and 141 in 1958. All these estimates were found to be statistically significant.[13]

The difficulty resulting from the lack of industrial wage averages for 1952–54 could be partly overcome by using another source of data for those years — the CBS industrial wages surveys. Table 3 presents measures of the relative dispersion (interquartile range *divided by* the median) of wages of industrial workers in August 1952, October 1953, and November 1954. It is shown that relative wage dispersion remained more or less the same among daily workers in industry between these dates. However, we are still

[13] For the nature of the significance test, see my article, *op. cit.*

ignorant of possible changes in differentials between 1951 and 1952, as well as between 1954 and 1955.

On the basis of Figure 7 and Table 3, we may conclude that industrial relative wage differentials widened on the average during the period of mass immigration, in particular between 1947 and 1948. It is difficult to say anything about annual movements of relative wage differentials within the period. On the other hand, it is likely that relative wage differentials widened steadily during the period of the second wave of immigration, 1955–58, and in particular between 1955 and 1956. This relative rise in the prices of the higher paid services should be contrasted with the relative price decline which took place during the second world war, especially from 1941 to 1942.

TABLE 3. *Relative Wage Dispersion*[a] *in Industry: 1952–54*
(per cent)

	1952 (August)	*1953 (October)*	*1954 (November)*
Weekly earnings			
Total	49	50	50
Men	36	36	35
Women	34	34	36
Basic wage			
Total	34	36	34
Men	23	25	24
Women	23	24	23

[a] Interquartile range as per cent of median wage of adult daily workers in industry.
SOURCE: CBS, *Statistics of Wages in Industry (August 1952)*, Special Series No. 15, Jerusalem 1953, pp. 68, 74–75 (Hebrew), and *Statistics of Wages (1953–1954)*, Special Series No. 38, Jerusalem 1953, pp. 38, 42–43 (Hebrew).

The general rise in the relative prices of higher paid labor services since 1948 is in accordance with the hypotheses of chapter II, which imply a reduction of the relative price of unskilled labor services as a result of mass immigration. But if the changes in relative labor prices are examined from year to year, one cannot avoid the impression that the unskilled relative price decline between 1947 and 1948 came too early to be explained by mass immigration alone. This began only in the second half of 1948 and did not exert real pressure on the labor market before 1949–50.

The early rise of the relative labor prices of the higher paid industrial services is not the only wage development requiring additional explanation.

As noted in the previous chapter, the delay in the decline of labor prices (relative to capital) which began around 1952 and the relative price decline of professional services which took place in 1952–53 require further explanation too. These labor price movements will be discussed in the next chapter which deals with problems of wage policy.

CHAPTER V

THE WAGE POLICY

Movements in wage level and structure were described in the last two chapters. In the present we attempt to explain some of these movements by changes in official union wage rates and some other components of labor costs agreed upon by collective bargaining. The main purpose of this chapter is to examine the question whether mass immigration brought about a change of the traditional wage policy of labor market institutions, and in particular, whether these institutions supported the widening of relative wage differentials.

Union wage rates as well as other wage components agreed upon by collective bargaining are the relevant data for our test of the wage policy. Wage policy trends are measured in this chapter by the effect of each of the wage components introduced by labor market institutions on relative labor prices and wage differentials. Thus, our general method of investigation is based on measurement of wage changes where all but the investigated wage component are kept constant. By this method, the net effect of each component (or group of components) is estimated in turn. In this way, the effects of wage components determined by central institutions on a national basis can be separated from the effects of those determined by other institutions on an industrial, local, or even on a personal basis.

For lack of comparable union rates and actual wage data, we could not attempt a quantitative estimation of the percentage change in relative wage movements attributable to central institutions' wage fixing.[1] Instead, we attempted an independent estimation of the institutional impact on wages.

1. *Measurements of Institutional Wage Fixing*

Measures of the institutional impact on the wage level require data on the weight of different union rates. Such weights are not available for the period investigated, and we have therefore confined our treatment of wage level to some simple cases.

[1] Except for cost-of-living allowances with which we attempted a quantitative explanation of the changes in wage differentials presented above in Chapter IV. See Appendix B.

The main problem in this chapter is measurement of wage policy in the field of wage structure. The problem is how to measure the impact on relative wage differentials of a wage component which was instituted or changed by a labor market institution. Two complementary measures are discussed below: the cross-section and the time series.

Consider a ratio between two averages of wage differentials — one that takes account of all wage components and another that takes account of all but one particular wage component. The ratio supplies an estimate for the effect on wage differentials of the omitted component. For the ratio tells us by what percentage the actual average of wage differentials is greater (or smaller) than it would have been in the absence of the investigated component. Therefore, if we know when this wage component was introduced (and which of the labor market institutions initiated it) we can relate the change in wage differentials reflected in our measure to the wage policy of a particular institution in a particular year.

However, most changes in the wage structure are not introduced by instituting new wage components. Instead, they are usually instituted by raising (or reducing) existing wage components. For this reason, the *cross-section* ratio of wage differentials gives us information on the accumulated effect on the wage structure of the investigated wage component, and not necessarily on its year-to-year effect, in which we are particularly interested.

Time-series measurement for institutional wage structure changes is not very different in its nature from the cross-section measurement discussed above, and could supply us with this additional information. Instead of omitting the investigated wage component from one of the averages of wage differentials compared, we omit the yearly change in this component. In particular, consider a ratio between two wage differential averages — between an average of differentials in year 2 and an average of wage differentials for the same year, with the investigated wage component taken as it was in year 1. This ratio tells us by what percentage the average of wage differentials in year 2 is greater (or smaller) than it would have been if no change in the investigated wage component had been made.[2] The effect

[2] Using the same notation as in foot note 6 of Chapter IV, both cross-section and time-series measurements are formulated by

$$\frac{\sum_{i=1}^{\bar{n}} [z_i x_{it}]}{\sum_{i=1}^{n} [z_i (x_{it} - h_{it})]},$$

of the change which was made in the wage component on the wage structure of a particular year is thus reflected in this measure.

On the following pages cross-section and time-series measures are presented as indicators of the effect of the various wage components on the wage structure. In some cases our measures were based on partial data. These measures indicate only the *direction* of the wage components' influence on wage structure, and cannot be taken as estimates of the *extent* of the influence.[3]

2. *Cross-Section Estimates*

Table 4 presents cross-section estimates of the impact of wage components on wage structure. The table shows the cumulative effect of overtime payments, premiums, grants, and family and cost-of-living allowances, as well as the effect of basic rates on relative wage differentials in 1952 and 1953.[4] The data from which the table was computed are average weekly wage components in 10 to 12 manufacturing industries.

All the estimates of Table 4 which relate to daily workers and most of the other estimates are statistically significant.[5] These estimates indicate that cost-of-living allowances were the only wage component that worked to narrow relative wage differentials in 1952 and 1953. However, the cumulative effect of the other wage components was larger than that of cost-of-living allowances in the case of daily and piece

where h_{it} denotes the investigated wage component for the cross-section measurement and the yearly change (from year $t-1$ to year t) in this component for the time-series measurement.

It should be noted that the computation of these estimates requires complete data for all wage components.

3 If we define $x_{it}=a_{it}+b_{it}$ where b_{it} denotes the sum of wage components on which we have data,

$$\frac{\Sigma zx}{\Sigma[z(x-h)]}=\frac{\Sigma[z(a+b)]}{\Sigma[z(a+b-h)]}=\frac{\Sigma za+\Sigma zb}{\Sigma za+\Sigma[z(b-h)]}$$

where the subscripts (i and t) have been omitted. The computation of

$$\frac{\Sigma zb}{\Sigma[z(b-h)]}$$

which we made in the time series investigation tends to exaggerate the influence of h on the wage structure. However, it indicates the direction of this influence.

4 Instead of estimating separately the effect of premiums, grants etc., we measured the combined effect of overtime and premiums, overtime premiums and grants, etc.

5 For the significance test, see Bahral, *op. cit.*

workers. This offsetting influence was no greater in the case of monthly workers. Because of a change in the sample, the corresponding estimates for 1952 and 1953 could not be compared with each other.

TABLE 4. *The Cumulative Effect*[a] *of Wage Components on Relative Wage Differentials: 1952 and 1953*

	1952	*1953*
A. *Daily workers*		
Overtime	1.053	1.056
plus premiums	1.151	1.188
plus bonuses	1.199	1.222
plus family allowance	1.237	1.254
plus cost-of-living allowance	1.181	1.175
Basic rate[b]	1.047	1.067
B. *Piece-rate workers*		
Overtime	1.181	1.130
plus premiums	1.304	1.191
plus bonuses	1.401	1.163
plus family allowance	1.503	1.228
plus cost-of-living allowance	1.301	1.137
Basic rate[b]	1.155	1.080
C. *Monthly workers*		
Overtime	1.031	1.169
plus bonuses	1.239	1.469
plus family allowance	1.248	1.447
plus cost-of-living allowance	0.983	0.952
Basic rate[b]	1.270	1.520

[a] The figures show the ratio of actual average differentials to average differentials as they would have been in the absence of the given wage component.

[b] For technical reasons these ratios show the effect of the basic rate wage component on union rate (basic *plus* cost-of-living allowance) differentials, and not on actual differentials.

SOURCE: Calculated from data in CBS, *Statistics of Wages in Industry* (*August 1952*), *op. cit.*, and *Statistics of Wages* (*1953–1954*), *op. cit.*

These findings are consistent with the finding of unchanged relative dispersion of wages in 1952–53 among daily workers in industry (see Table 3 above). Thus we may tentatively conclude, that the other wage components (grants, premiums, and overtime payments in particular) offset the equalitarian influence of cost-of-living allowances in 1952–53, and prevented the narrowing of relative wage differentials among daily and piece workers

This was probably not true for the monthly workers. Moreover, it is reasonable to suppose that cost-of-living allowances reduced the wage ratio of salaried professionals to industrial workers in 1952–53.

Let us turn now to another element of labor cost which does not appear in the usual wage statistics — social benefit payments — on which data are available for the year 1951/52 from the CBS Census of Industry.

Social benefit payments are expected to provide funds for illness, vacation, work stoppage, insurance, and other purposes required by law, convention, or collective agreement. The ideology behind these payments is naturally equalitarian. It is quite interesting therefore to examine the actual influence of social benefit payments on the wage structure at the end of the mass-immigration period.

Table 5 presents the effect of social benefits payments on relative wage

TABLE 5. *The Effect*[a] *of Fringe Benefits on Relative Wage Differentials: 1951/52*

	Daily earnings	*Annual earnings*
All branches	1.163	1.090
Food	1.252	1.089
Textiles	1.135	1.104
Clothing	1.132	1.108
Metals	1.222	1.095
Machinery	1.219	1.199
Electricity	1.071	1.060
Wood	1.505	1.292
Paper	1.070	1.076
Chemicals	1.126	1.152
Stone and cement	1.077	1.084
Miscellaneous	1.130	1.080

[a] The figures show the ratio of actual average wage differentials to average differentials as they would have been in the absence of fringe benefits.

SOURCE: Calculated from CBS, *Census of Industry 1952* (*Part B*), Special Series No. 41, Jerusalem, 1955.

differentials in the year 1951/52. The estimates of the table were computed from average wage data of manufacturing sub-industries, the number of which varied from industry to industry. The total number of sub-industries for all manufacturing industries was 166.

Table 5 shows a clear tendency for high-wage industries to have proportionately larger social benefit payments than low wage industries. This was found in every case examined, for annual as well as daily wage data. The reason for this is probably the tendency to pay proportionately larger social benefits to men than to women, to adult workers than to youths, to permanent staff than to temporary workers, etc. In any case, Table 5 shows that relative wage differentials widened when social benefit payments were added to wages. This contradicts the equalitarian expectation with regard to these payments.

To summarize, the cumulative effect of basic rates, family allowances, grants, premiums, overtime and social benefit payments was to widen relative wage differentials in the years immediately after mass immigration, at a time when cost-of-living allowances worked in the opposite direction. On the basis of Tables 4 and 5 it is impossible to identify the year in which these policies were carried out. For this purpose we attempt a time-series analysis, presented in the following section.

3. *Time-Series Measurements*

Time-series data are available for only two wage components — basic rates and cost-of-living allowances. For this reason, measures of the effect of these wage components on wage structure developments could not be taken as estimates for the extent of this effect. Instead, they supply us with information on the direction and relative intensity of the effects in the various years.

Another shortcoming of our time series is the absence of statistical data even on these two wage components for the full period of mass immigration and before. For this reason we had to base our investigation on the published cost-of-living agreements.

Let us turn first to basic rates, a term invented to simplify the cost-of-living allowance computations. Basic rates were originally actual wage rates, to which the first cost-of-living allowance was added. Later on, basic rates were fixed even for new workers who had never actually received basic rates as wages: it was the automatic connection between the cost-of-living allowances and the consumer price index which made it convenient to use the concept of basic rates for frequent adjustments in the allowances.[6]

The first set of basic rates was that of 1939. Changes in the original rates for the different occupations were introduced from time to time, usually on a yearly basis, by collective bargaining which began to appear in the

[6] Government of Palestine, *Report of the Wages Committee*, Jerusalem, 1943, p. 28 and pp. 46–47.

field of industrial relations in Palestine during the second world war.[7] Another set of basic rates appeared in 1952, when it was decided to define the new basic rates as the sum of the old (1951) basic rates and the old cost-of-living, seniority, and family allowances.[8] A similar change in basic rates definition took place in 1957.[9]

Comparable and reliable data on basic rates are available only from 1951 onwards. There is, therefore, no possibility of testing this wage component as an explanatory variable for movements of the relative labor prices during the period of mass immigration. The absence of reliable basic rate data for the early years of the State is probably connected with the fact that the determination of rates was less centralized at the time. Centralized basic rate determination was established in 1952, when it was decided to keep rates unchanged during the period of rising prices. Indeed, basic rates were kept constant until 1955–56. From 1956 onwards they were changed regularly at the beginning of every second year.

By keeping basic rates unchanged and tying cost-of-living allowances to the Consumers' Price Index, central labor institutions made it possible for the government to reduce labor prices relative to equipment prices by raising equipment prices more than consumer prices. As noted, (see Figure 4) the relative price of labor declined during the wage freeze period, 1952 to 1955, after which it was decided to raise basic rates. The relative price of labor increased more or less steadily during 1955–58.

Under the system of cost-of-living allowances described below, basic rate determination was not an isolated process: determination of a basic rate for an occupation meant automatic fixing of the cost-of-living allowance for this occupation. Thus, there is no point in analyzing the effect of basic rates on the wage structure independently of cost-of-living allowances. Instead, we shall combine the two factors and discuss their joint effect.

Table 6 presents measurements for the impact of union rates (= basic rates + cost-of-living allowances) on relative wage differentials in 1951–58. The union rates from which these measures were computed were basic rates plus cost-of-living allowances in 120 representative occupations — 40 of them in agriculture and 80 in manufacturing and construction. These figures are published regularly by the CBS. In the absence of data on wage components (other than basic rates and cost-of-living allowances) the measures of Table 6 should be taken as indicators of only the direction and relative strength of the union rates effect on wage differentials in the various years.

7 See *ibid.*, pp. 20–22.

8 Histadrut, *National Wage Rates, 1952*, February 1952 (Hebrew) p. 21.

9 CBS, *Statistical Abstract No. 10*, p. XXXII.

Table 6 shows the marked effect of union rates in narrowing relative wage differentials during 1952–53. This change was more marked in manufacturing and construction than in agriculture. Since basic rates in industry and construction were kept unchanged during 1951–55, this narrowing effect on differentials was the result of the cost-of-living allowances factor alone. For the same reasons, this factor is the only explanation for the widening effects during 1954–55.

TABLE 6. *The Effect*[a] *of Union Rates on Relative Wage Differentials, 1951–58 (1953 = 1)*

	Agriculture, industry and construction	*Agriculture*	*Industry and construction*
1951	1.290	1.114	1.393
1952	1.067	1.025	1.090
1953	1.000	1.000	1.000
1954	1.033	1.030	1.039
1955	1.043	1.015	1.057
1956	1.066	0.958	1.225
1957	1.196	1.057	1.336
1958	1.192	1.054	1.328

[a] The figures show the ratio of average union rate differentials in each year to the average union rate differential in 1953.

SOURCE: Calculated from CBS, *SAI 1955/59*, No. 7, pp. 193–97, and *SAI 1958/59*, No. 10, pp. 311–15.

Basic rates changed only in 1956, and operated in the same direction as cost-of-living allowances, which began to widen relative wage differentials at the beginning of 1954. This widening effect, which seems to be both stronger and more systematic in industry and construction than in agriculture, was probably the result of the new wage policy of the Histadrut. As Table 6 shows, this effect ceased in 1958.

As mentioned, there are no figures on cost-of-living allowances for the period of mass immigration. But since we are dealing with problems of wage policy rather than with actual wage behavior, information from the published cost-of-living agreements could be used for analyzing the effect of cost-of-living allowances on wage developments. This requires the assumption that cost-of-living allowances were actually paid according to agreement — an

assumption closer to reality for recent years than for the period of mass immigration or before. But in view of the importance of cost-of-living allowances as a wage component (to be discussed below), it is probably worthwhile investigating the problem, even using this limited source of information, which is the best we have.

This sort of analysis cannot be summed up in terms of a simple statistical measurement. Instead, it requires detailed treatment and the laborious work of giving numerical expression to the clauses of the cost-of-living agreements, so that the effect on wage developments can be deduced. It is to this detailed analysis that we now turn.

4. *Cost-of-Living Agreements*

The fixing of cost-of-living allowances has in recent years been the most centralized wage determination process in the country. Agreements providing for the allowances are signed by the Unions Department of the Histadrut on the one side and the Manufactures' Association on the other. Although not more than 10 percent of employees work for employers represented by the Manufacturers' Association, almost all employers, including the government and Histadrut-owned enterprises, pay the agreed cost-of-living allowances as if they were parties to the agreement.

The allowances provided for by the agreements, were as a rule, equal for workers whose basic rates were the same — irrespective of industry, location or any other consideration. The ratio of allowances to basic rates at any point of time was the same for most workers.[10] Changes in cost-of-living allowances were introduced according to a well-defined pricinple: each agreement was signed for a certain level of the Consumers' Price Index, and provided a compensating allowance which, generally speaking, raised (or lowered) most wages in proportion to the movements of the index.[11] The importance of cost-of-living allowances as a wage component in Israel is evident in view of the more than tripling of the consumer price level during the ten year period of the State, and of a similar increase during the last ten years of the Mandate.

Let us observe first the effect of cost-of-living allowances on wage level developments. During the period of mass immigration, from mid-1949, the Consumers' Price Index began to fall as a result of price control and the sub-

[10] Up to a certain maximum of a basic rate. We shall return to the exceptions — the higher paid worker — in the following discussion on the effect of the allowances on the wage structure.

[11] Since 1943, the ratio of allowances to basic rates equalled the rise of the Consumers' Price Index up to a maximum basic rate.

sidization policy of the government. From 365 in January–April 1949 (August 1939 = 100) and 370 in May–July 1949, the Index (according to which the allowances were paid) fell to 350 in August–October 1949, and 329 in November 1949–January 1950, reaching the low level of 321 for the whole of 1950.[12] In early 1951 the Index rose slightly to stand at 337 in April. The decline in the Index was automatically followed by a corresponding reduction in cost-of-living allowances.[13]

Subsidization and price control with the aim of lowering the Consumers' Price Index (or at least reducing its rate of increase) continued in the period that followed. The task was difficult, for at the same time the government raised the general price level by raising the prices of capital goods and other relatively scarce commodities. In particular, it was impossible to prevent a rise in the Consumers' Price Index in periods of successive devaluations of the Israeli pound, especially in 1952–53. But as noted (Chapter III), consumer prices rose much less than other prices at the time.

Let us turn now to our main problem — the extent to which central labor market institutions actually used cost-of-living allowances for changing the wage structure. Figure 8 presents the effect of cost-of-living allowances on relative wage differentials during two periods — 1939–51 and 1952–57. For reasons already noted and because of our arbitrary choice of certain basic rates for purposes of illustration the trends reflected in the figure merely indicate the direction and relative strength of the effect of cost-of-living allowances on wage differentials in the various years. They should not be taken as accurate estimates of the effect.

All the curves in Figure 8 represent ratios between 'high' and 'low' union rates (basic rates *plus* cost-of-living allowances); basic rates were arbitrarily chosen and held constant for each of the two periods investigated. Cost-of-living allowances were added to these basic rates according to the agreements. Curves (1), (2), (3) and (4) in this figure, for 1939–51, represent union rates of workers whose basic rates were, respectively, LP or IL 8, 10, 14 and 21 per month, *divided by* the union rate of a worker whose basic rate was LP 6. Curves (I), (II), (III) and (IV), for 1952-57, represent union rates of workers whose basic rates were, respectively IL 80, 100, 120 and 140, *divided by* the union rate of a worker whose basic rate was IL 60.

Downward sloping curves in Figure 8 represent declines in the union rates ratios, which are the result of less-than-proportionate cost-of-living allowances to higher-paid workers (as compared with those paid to lower-paid workers). Upward sloping curves represent a rise in the union rate

[12] CBS, *Statistical Abstract of Israel, 1952/53*, No. 4, p. 98. See also Appendix Table B-1.
[13] *Ibid.* See also Histadrut, *In the Thirtieth Year*, p. 313.

ratios, which are the result of more-than-proportionate cost-of-living allowances to higher-paid workers (compared with those paid to lower-paid workers). These movements should be taken as indicators of the effect of cost-of-living allowances in narrowing or widening the relative wage differentials.

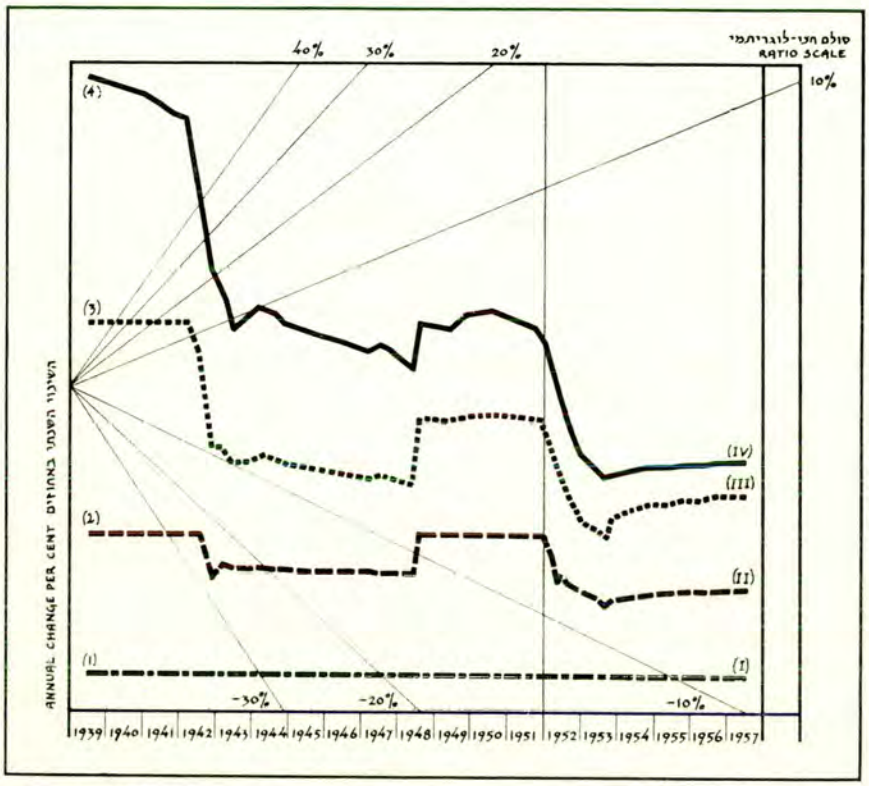

FIGURE 8. *The Effect of Cost-of-Living Allowances on Relative Wage Differentials*[a]

[a] Ratios of 'high' to 'low' union rates, calculated as explained in the text, p. 54.

Figure 8 shows that the general trend of cost-of-living allowances was to narrow relative wage differentials. As a rule, the cost-of-living agreements provided for relatively higher allowances for the lower-paid workers. Thus, a cross-section measurement for the impact of these allowances on wage differentials in any year during the period would indicate a narrowing effect of the allowances on differentials.

Time-series measurements would, however, tell a different story. Additional cost-of-living allowances which were instituted from time to time

did not always favor the lower-paid workers. As Figure 8 shows, union rate ratios rose in several years during the period. This was the result of more-than-proportionate additional allowances for the higher-paid workers. In these cases, time-series measurements would indicate the widening year-to-year effect of cost-of-living allowances on relative wage differentials. Thus, although cost-of-living allowances could be regarded as a factor which worked to narrow relative wage differentials over long periods, this was not always the case during short periods. Changes in cost-of-living agreements influenced relative wage differentials in both directions.

A historical description of the cost-of-living allowances agreement during 1939–1958 and a detailed analysis of its effect on wage differentials are given in Appendix A.[14] Generally speaking, downward movements of union rate ratios were the result of flat rate allowances given to the higher paid workers. This was usually done by providing proportionate allowances up to a maximum: a maximum basic rate was determined up to which the ratio of cost-of-living allowances to basic rates was constant, and in proportion to the rise of Consumers' Price Index; at higher basic rates allowances were equal (absolutely) to that of the maximum basic rate.[15] This was the case during the war and postwar period 1939–47, when (as indicated by Figure 8) the effect of cost-of-living allowances was to narrow relative wage differentials.

The rising movements of union rate ratios seen in Figure 8 are the result of fixing the maximum basic rates at higher levels. Raising the maximum meant additional allowances at basic rates higher than the old maximum, while allowances at the lower basic rates remained the same.

In July 1948 the maximum basic rate for proportionate allowances was raised from IL 8.5 to 10.5, and the maximum for more than flat-rate (although not proportionate) allowances was raised from IL 10.5 to 12.5. Thus, the additional allowances immediately given on basic rates above IL 8.5 raised the ratios of these union rates to union rates of workers whose basic rates were below IL 8.5. These higher ratios remained almost unchanged

14 The reader interested in details is urged to read Appendix A at this point.

15 This maximum, which was LP 16 (per month) in 1941 and LP 8.5 in 1942, narrowed relative wage differentials during these years when prices were rising considerably, and 1942 in particular (compare Figures 7 and 8). The milder effect of cost-of-living allowances on relative wage differentials during 1943–47 was the result of a slower price increase and a change in the cost-of-living agreement which provided more than flat rate (although not proportionate) allowances to monthly basic rates of LP 8.5–10.5. The maximum basic rate for proportionate allowances was LP 8.5. Flat rate allowances were given on basic rates higher than LP 10.5 from April 1943 onwards.

until 1952; the new maximum was not effective in narrowing wage differentials because of the official price stability during the period of mass immigration. A slight rise in the union rate ratios took place in 1949–50 as a result of the downward movement of the Consumers' Price Index.

This rise in the union rate ratios should be emphasized in view of the corresponding early widening of relative wage differentials in 1948–49 (compare Figures 7 and 8). In addition, both series were fairly stable (on a relatively high level) during 1948–51. A connection between these two movements may plausibly be assumed. We shall return to this hypothesis in Appendix B.

The downward movement of the union rate ratios during 1952–53 shown in Figure 8 is due to another maximum (for proportionate cost-of-living allowances) basic rate determined early in 1952. During the two years the maximum was IL 80 (per month), while the price index doubled. Flat-rate allowances for basic wages above IL 80, and proportionate allowances for basic rates below IL 80, reduced the union rate ratios considerably. During the same period, 1952–53, we find a corresponding decline of the ratio of professional earnings to wages of industrial workers (see Figure 6 above). This decline was probably the reason for complaints by professionals about the system of cost-of-living allowances.[16] On the other hand, relative dispersion of industrial daily wages was more or less constant during these years (see Table 3).

The slow but steady rise of union rate ratios during 1954–57 (see again Figure 8) was the result of a new cost-of-living agreement made at the beginning of 1954. According to this agreement, a higher maximum basic rate, IL 125, for *additional* cost-of-living allowances was introduced for *future* increases in the price index. Since the new maximum was effective only for future additional allowances, the effect on the union rate ratios was not immediate, but the ratios were affected gradually over 1954–57; the ratios of additional allowances to union rates of workers whose basic rates were above IL 80 (and below IL 170) exeeded the rise of the price index during 1954–57, while the corresponding ratio for basic rates below IL 80 equalled the price index rise. This was the case until 1957, when a new cost-of-living agreement was signed. According to this, allowances were proportionate, up to top salaries whose new basic rates (1956) exceeded IL 500.

During 1954–57 movements of union rate ratios were similar to the corresponding movements of relative wage differentials (compare Figures 6, 7 and 8). As we saw earlier, the movements of these series were similar in other periods too. An attempt should be made, however, to explain move-

[16] See Committee for Inquiring into Salaries and Grading of Civil Servants, *Report*, 1955, part 2 (Hebrew) p. 1.

ments of relative wage differentials by changes of cost-of-living allowances. This is done in Appendix B.

To summarize, the absence of sufficient data makes it impossible to examine carefully the role of institutions in determining wage movements in Israel. Our argument, based on the available data, suggests that labor market institutions supported the market course of wage changes during most of the years under consideration, as if they were sensitive to the pressure of market forces.

In 1948, when mass immigration began, relative wage differentials were widened by means of cost-of-living allowances and probably also by some of the other wage components such as fringe benefits, grants and premiums. Relative wage differentials were widened again during the period of the second wave of immigration by changes in basic rates and cost-of-living allowances. In contrast to the sudden and marked widening of relative wage differentials at the beginning of the mass-immigration period, in 1954–57 changes in the wage structure were introduced gradually as immigration rose. This widening of relative wage differentials stopped in 1958 — at the end of the second wave of immigration, which reached its peak in 1957.

The movement of labor prices relative to other prices in the economy (such as equipment prices) does not seem to be correlated with the movement of immigration. The decline of the ratio of wages to equipment prices, which was the result of local currency depreciation, lagged some years behind the beginning of mass immigration. During and after the second wave of immigration, a plan for raising equipment prices by raising taxes on imported equipment was suggested and examined by the government. The original plan had not been carried out up to the devaluation of the Israeli pound in February 1962.

APPENDIX A

COST-OF-LIVING ALLOWANCES AND WAGE DIFFERENTIALS

Many writers assume that cost-of-living allowances narrow relative wage differentials in periods of inflation. The purpose of this appendix is to give details of the cost-of-living systems in mandatory Palestine and Israel which, in the periods of immigration, 1948–51 and 1954–57, ran counter to this generally accepted view. In these periods, cost-of-living allowances worked to widen relative wage differentials between higher and lower-paid workers.

1. *Mandatory Palestine*

The first cost-of-living agreement between the Histadrut and the Manufacturers' Association was signed in December 1940, providing an allowance of 20 per cent of basic rates up to a maximum basic rate of LP 16 per month.[1] Workers whose basic rates were above LP 16 received an allowance equal to that of the LP 16 basic rate. Later agreements raised the allowance to 30 per cent (November 1941), 40 per cent (December 1941) and to 45 per cent (January 1942), for the same basic rates.[2] About 4 per cent of employees in manufacturing were estimated to have basic rates above LP 16 in 1939 and 1943.[3]

Until 1942 cost-of-living allowances were not automatically tied to the movements of the Consumers' Price Index. Both the Jewish Agency's and the government's price indexes were 175 in January 1942 (August 1939 = 100) compared to cost-of-living allowances of 45 per cent at that time — a fact which might explain the reduction in real wages during the early years of the war (see Figure 3 above). In 1942 it was agreed to pay cost-

1 Government of Palestine, *Report of the Wages Committee*, Jerusalem, 1943, p. 29.

2 *Ibid.* See also CBS, *Statistical Abstract of Israel, No. 4*, p. 98; G. Cyderovich and D. Gurevich, *Investigation into Workers' Wages and Earnings in Jewish Industry, 1943*, Jerusalem, 1945, (Hebrew), p. 32.

3 *Ibid.*, p. 43 and p. 48.
For exceptions to the rule according to which cost-of-living allowances were paid, see Government of Palestine, *Wage Rates Statistics Bulletin*, No. 9, 1940, p. 2; No. 10–11, p. 4. Also *General Monthly Bulletin of Current Statistics*, February 1942, p. 62; April 1942, pp. 159–162.

of-living allowances equal to 80 per cent of the rise in the Consumers' Price Index up to a maximum basic rate of LP 8.5 per month — the allowance on higher basic rates being a flat rate equal to the allowance on LP 8.5 basic rate.[4] It was also agreed that the allowance should in the future be adjusted at three-month intervals to movements of the cost-of-living index.

The first allowance according to this agreement was paid in April 1942 when the price index was 186. The second was paid in October 1942 when the index was 205. Since almost half of all workers in manufacturing had basic rates of over LP 8.5,[5] the new agreement had an important effect on the wage structure.

One should, however, distinguish between two entirely different influences of a new cost-of-living agreement on wage ratios (of high-paid to low-paid workers): there is the immediate effect of the new agreement when the new allowances are first paid; this must not be confused with the effect on wage ratios over time while the allowances are being adjusted to changes in the price index.

The immediate effect of the April 1942 agreement was to raise the allowances on basic rates below LP 13.2, and to reduce the allowances on basic rates above LP 13.2.[6] This latter category was estimated to cover 14 per cent of all workers in manufacturing.[7] The effect of the agreement over time (i.e. in October 1942) was to increase wages of workers whose basic rates were below LP 8.5 proportionately more than that of workers whose basic rates were higher and who accounted for almost half of all workers in industry.

Another change in cost-of-living allowances was introduced by the April 1943 agreement. This provided for new allowances on basic rates below LP 8.5, the ratio of the allowance to the basic rates being equal to the rise in the Consumers' Price Index (instead of 80 per cent of the rise). Workers whose basic rates were between LP 8.5 and 10.5 received additional allowances of 40 per cent of the index rise on that part of their basic rates which

4 Government of Palestine, *Report of the Wages Committee*, p. 29; CBS, *Statistical Abstract of Israel, No. 4.*

5 Cyderovich and Gurevich, *op. cit.*, p. 43.
For exceptions in computing allowances see *General Monthly Bulletin of Current Statistics*, November 1942, pp. 479–483. Also *Statistical Abstract 1943*, pp. 115–117; Cyderovich and Gurevich, *op. cit.*, pp. 31–34.

6 The rise of the index in April 1942 was 86 per cent, 80 per cent of which was rounded to 70 per cent. A worker whose basic rate was LP 13.2 received an old allowance of 45 per cent which was equal to 70 per cent of LP 8.5.

7 *Ibid.*, p. 43.

exceeded LP 8.5. Workers whose basic rates were above LP 10.5 received allowances equal to that on a basic rate of LP 10.5.[8]

The immediate influence of the allowances, which were paid in April 1943 according to an index of 218, was to increase wages of workers whose basic rates were below LP 13.8 proportionately more than that of workers whose basic rates were over LP 13.8.[9] This latter group of workers was estimated at 10 per cent of all workers in manufacturing. The effect of the agreement over time — from April 1943 until April 1948, when the index reached 312 — was to raise wages of workers whose basic rates were below LP 8.5 proportionately more than those of the rest, and in particular, that of those whose basic rates were over LP 10.5. The latter were (in 1943) estimated at 36 per cent of all workers in industry.

2. *Israel*

A marked rise in wage ratios occurred almost immediately after the establishment of the State. This rise was the result of a new cost-of-living agreement effective from July 1948, when the index was 344. According to this agreement, the maximum basic rate for which the ratio of allowances to basic rates was equal to the rise of the price index was raised from LP 8.5 to IL 10.5, and the maximum basic rate for which the ratio of the allowances to basic rates was 40 per cent of the rise of the index was raised from LP 10.5 to IL 12.5.[10] The immediate effect of the agreement was to raise allowances on basic rates of over IL 8.5, estimated to cover 92 per cent of all workers in manufacturing,[11] keeping unchanged allowances of the rest, including 30 per cent of women employees in manufacturing.

The effect of this agreement on wage ratios over time was negligible until April 1951, when the index was 337 compared to 344 in July 1948. A slight rise in the index (and allowances) took place towards the end of 1948 and continued until the middle of 1949. Then the index fell to the low level of

[8] Government of Palestine, *op. cit.*, p. 34; CBS, *Statistical Bulletin of Israel*, 7, May-July 1950, p. CXIV.

[9] Calculated from the equation

$$\frac{x + 10.970}{x + 7.225} = \frac{100 + 118}{100 + 85}$$

where 10.970 (pounds) is the maximum allowance paid in April 1943, the ratio of which to 8.5 pounds was 1.18, and 7.225 (pounds) is the maximum allowance paid in October 1942, the ratio of which to 8.5 pounds was 0.85. $X = 13.8$ is the basic rate, the wage on which increased during these two points of time proportionately to the corresponding increase of basic rates lower than 8.5 pounds.

[10] *Ibid.*; see also Histadrut, *In the Thirtieth Year* (Hebrew), pp. 312–13.

[11] Histadrut, *Survey of Wages in Industry, 1948* (Hebrew), pp. 20–21.

321 for the whole year of 1950, and rose once again to its April 1948 level in the first half of 1951. Towards the end of 1951 the index reached 382, when wages of workers whose basic rates were below IL 10.5 were raised proportionately more than those of the rest. These workers were estimated at 5 per cent of all workers in industry.[12] Another 5 per cent of all workers were estimated to have basic rates between IL 10.5 and 12.5.

A new cost-of-living agreement was signed at the beginning of 1952, defining a new concept of basic rates which included 'old' basic rates, 'old' cost-of-living allowances and some other wage components. The agreement fixed a maximum basic rate of IL 80 per month, for which the ratio of the allowance to basic rates was equal to the rise of the index. Allowances for higher basic rates were equal to those of IL 80.[13] Since the Consumers' Price Index doubled in the two-year period 1952–1953, the effect of the allowances on wage ratios was considerable. The importance of the decline in wage ratios is evident in view of the fact that about half of the workers in manufacturing had basic rates below 80 pounds.[14] Practically all employers paid cost-of-living allowances according to this agreement as if they were parties to the agreement. This is still the practice today.

Another change in the cost-of-living agreement was introduced in January 1954. According to this agreement, a new maximum basic rate, IL 125 per month, was fixed for additional allowances to be paid in case of future increases of the price index. No change was introduced in the basic rates definition, in the computation of allowances to basic rates below IL 80, and in the computation of allowances for all other workers for past rises in the index.

Thus, from January 1954 allowances on basic rates over IL 80 were the sum of two elements: the first was IL 80.8 paid according to the December 1953 index which was 201 (September 1951 = 100) .The second element was the additional allowance, the ratio of which to basic rates up to a maximum of IL 125 was equal to the rise of the Consumer Price Index over 201.[15] The result of this complicated arrangement was to raise wages of workers whose basic rates were between IL 80 and 170 proportionately more than the rise

12 Histadrut, *Survey of Wages in Industry, 1950* (Hebrew), pp. 30, 32. For exceptions in calculating cost-of-living allowances see CBS, *Statistical Bulletin of Israel, 7*, May-July 1950, pp. CXIV and 487.

13 CBS, *Statistical Abstract of Israel No. 5*, pp. XXIII–XXIV.

14 CBS, *Statistics of Wages, 1953-54*, Special Series No. 38, pp. 38–39; 77–80.

15 CBS, *Statistical Abstract No. 5*, XXIII–XXIV.

of the price index.[16] This group of workers was estimated to include 60 per cent of the men and 6 per cent of the women employed in manufacturing.[17] Workers whose basic rates were over IL 170 were estimated at less than 1 per cent in manufacturing and less than 3 per cent in government and other civil services.[18]

The first allowance paid according to this agreement was based on a price index of 216 in January 1954 (September 1951 = 100) and the last was based on an index of 245 in 1956–57. The agreement was changed in July 1957, when a new cost-of-living arrangement provided for allowances whose ratio to basic rate was equal to the rise of the price index for all basic rates up to IL 500 per month.[19] According to this last agreement, basic rates were defined as the wages of December, 1956. The available data do not permit us to estimate the per cent of workers whose basic rates were above IL 500 in 1957–58. It is believed, however, that their share was negligible.

16 Let X_0, X_t, and K_t denote basic rates, wages and the price index for period t, respectively. According to the 1954 agreement, wages were computed as

$$X_t = K_t \cdot X_0 \qquad \text{for } X_0 < 80;$$

$$X_t = X_0 + (K_t - 1)80 + (K_t - 2.01)(X_0 - 80) = (K_t - 1.01)X_0 + 80.8 \qquad \text{for } 80 < X_0 < 125;$$

$$X_t = X_0 + (K_t - 1)80 + (K_t - 2.01)45 = X_0 + 125K_t - 170.45 \qquad \text{for } X_0 > 125.$$

It could be easily shown that when $K_{t+1} > K_t$

$$\frac{X_{t+1}}{X_t} = \frac{(K_{t+1} - 1.01)X_0 + 80.8}{(K_t - 1.01)X_0 + 80.8} > \frac{K_{t+1}}{K_t} \qquad \text{for any } 80 < X_0 < 125;$$

$$\frac{X_{t+1}}{X_t} = \frac{X_0 + 125K_{t+1} - 170.45}{X_0 + 125K_t - 170.45} > \frac{K_{t+1}}{K_t} \qquad \text{for any } 170.45 > X_0 > 125.$$

The last inequality holds conversely for any $X_0 > 170.45$. It also could be shown that the maximum $\frac{X_{t+1}}{X_t}$ for a given $\frac{K_{t+1}}{K_t}$ is that of $X_0 = 125$.

17 CBS, *Statistics of Wages, 1953–54*, pp. 38–39; 77–80.

18 *Ibid.*, pp. 86 and 103. About 10 per cent of administrative workers in the civil service and in commercial and industrial enterprises were estimated to have monthly basic-rates above IL 170.

19 CBS, *Statistical Abstract No. 10*, p. 289.

APPENDIX A

TABLE A–1. *Maximum Monthly Cost-of-Living Allowance,*[a]

Date	*Index*	*Cost-of-living allowance*
A. *According to the old index (August 1939 = 100)*		
1.1941	128	3.200
8.1941	140	3.200
11.1941	156	4.800
12.1941	166	6.400
1.1942	174	7.200
4.1942	186	8.650
10.1942	205	7.225
16. 4.1943 — 15. 7.1943	218	10.970
16. 7.1943 — 15.10.1943	248	13.760
16.10.1943 — 15. 1.1944	243	13.295
16. 1.1944 — 15. 4.1944	230	12.090
16. 4.1944 — 15.10.1944	236	12.640
16.10.1944 — 15. 4.1945	249	13.865
16. 4.1945 — 15.10.1946	258	14.690
16.10.1946 — 15. 4.1947	273	16.100
16. 4.1947 — 15. 7.1947	281	16.725
16. 7.1947 — 15.10.1947	275	16.275
16.10.1947 — 15. 1.1948	285	17.200
16. 1.1948 — 15. 4.1948	298	18.400
16. 4.1948 — 15. 7.1948	312	19.725
16. 7.1948 — 15.10.1948	344	27.600
16.10.1948 — 15. 1.1949	358	29.150
16. 1.1949 — 15. 4.1949	365	29.950
16. 4.1949 — 15. 7.1949	370	30.500
16. 7.1949 — 15.10.1949	350	28.250
16.10.1949 — 15. 1.1950	329	25.875
16. 1.1950 — 15. 1.1951	321	24.975
16. 1.1951 — 15. 4.1951	337	26.775
16. 4.1951 — 15. 7.1951	351	28.370
16. 7.1951 — 15.10.1951	364	29.830
16.10.1951 — 15. 1.1952	382	31.860

and the Consumers' Price Index: 1941–58

Date	*Index*	*Cost-of-living allowance*
B. *According to the new index (September 1951 = 100)*		
16. 1.1952 — 15. 3.1952	107	5.600
16. 3.1952 — 15. 4.1952	120	16.000
16. 4.1952 — 15. 5.1952	132	25.600
16. 5.1952 — 15. 7.1952	144	35.200
16. 7.1952 — 15. 9.1952	157	45.600
16. 9.1952 — 15.12.1952	165	52.000
16.12.1952 — 15. 3.1953	175	60.000
16. 3.1953 — 15. 6.1953	182	65.600
16. 6.1953 — 15. 9.1953	191	72.800
16. 9.1953 — 15.12.1953	201	80.800
16.12.1953 — 15. 3.1954	208	89.550
16. 3.1954 — 15. 9.1954	216	99.550
16. 9.1954 — 15.12.1954	222	107.050
16.12.1954 — 15. 9.1955	228	114.550
16. 9.1955 — 15.12.1955	231	118.300
16.12.1955 — 15. 3.1956	236	124.550
16. 3.1956 — 15. 6.1956	239	128.300
16. 6.1956 — 15. 7.1957	249	140.800
16. 7.1957 — 15. 7.1958	258	16.000
16. 7.1958 — 31.12.1958	267	18.000

[a] According to agreements between the Histadrut and the Manufacturers' Association.
[b] New definition of basic rate.
SOURCE: CBS, *SAI 1952/3*, No. 4, p. 98, and *SAI 1958/59* No. 10, p. 289.

TABLE A–2. *Cost-of-living Allowance Computations, Annual Average: 1941–58*

Basic rate:	0—8.5	8.5—10.5	10.5—16.0	16.0 +
1941	$X_1 = 1.225X_0$	$X_1 = 1.225X_0$	$X_1 = 1.225X_0$	$X_1 = X_0 + 3.600$
1942	$X_2 = 1.675X_0$	$X_2 = 1.113X_0 + 4.781$	$X_2 = 1.113X_0 + 4.781$	$X_2 = X_0 + 6.581$
1943	$X_3 = 2.211X_0$	$X_3 = 1.385X_0 + 7.015$	$X_3 = X_0 + 11.060$	
1944	$X_4 = 2.375X_0$	$X_4 = 1.55\ X_0 + 7.013$	$X_4 = X_0 + 12.788$	
1945	$X_5 = 2.554X_0$	$X_5 = 1.662X_0 + 7.925$	$X_5 = X_0 + 14.452$	
1946	$X_6 = 2.611X_0$	$X_6 = 1.644X_0 + 8.216$	$X_6 = X_0 + 14.982$	
1947	$X_7 = 2.780X_0$	$X_7 = 1.712X_0 + 9.078$	$X_7 = X_0 + 16.554$	
Basic rate:	0—8.5	8.5—10.5	10.5—12.5	12.5 +
1948	$X_8 = 3.250X_0$	$X_8 = 2.589X_0 + 5.621$	$X_8 = 1.459X_0 + 17.482$	$X_8 = X_0 + 23.220$
1949	$X_9 = 3.547X_0$		$X_9 = 2.019X_0 + 16.046$	$X_9 = X_0 + 28.781$
1950	$X_{01} = 3.213X_0$		$X_{10} = 1.885X_0 + 13.942$	$X_{10} = X_0 + 25.007$
1951	$X_{11} = 3.560X_0$		$X_{11} = 2.024X_0 + 16.128$	$X_{11} = X_0 + 28.928$
Basic rate:	0—80	80—125	125—359.2	359.2 +
1952	$X_{12} = 1.417X_0$		$X_{12} = X_0 + 33.360$	
1953	$X_{13} = 1.886X_0$		$X_{13} = X_0 + 70.880$	
1954	$X_{14} = 2.163X_0$	$X_{14} = 1.153X_0 + 80.800$	$X_{14} = X_0 + 99.925$	
1955	$X_{15} = 2.291X_0$	$X_{15} = 1.281X_0 + 80.800$	$X_{15} = X_0 + 115.925$	
1956	$X_{16} = 2.438X_0$	$X_{16} = 1.428X_0 + 80.800$	$X_{16} = X_0 + 134.300$	
1957	$X_{17} = 2.527X_0$	$X_{17} = 1.502X_0 + 81.985$	$X_{17} = 1.015X_0 + 142.865$	$X_{17} = X_0 + 148.133$
1958	$X_{18} = 2.610X_0$	$X_{18} = 1.551X_0 + 84.678$	$X_{18} = 1.048X_0 + 147.558$	$X_{18} = X_0 + 165.000$

NOTATION: X_0 = basic rate in IL.
$X_1 \ldots X_{18}$ = total wages (basic rate *plus* cost-of-living allowance) for 1941 through 1958, respectively.
IL 359.2 is the basic rate according to the 1951–based calculation which is the equivalent of IL 500 according to the 1956–based calculation.

SOURCE: See source to Table A–1.

APPENDIX B

AN INSTITUTIONAL EXPLANATION FOR CHANGES IN WAGE DIFFERENTIALS

For lack of union rates data comparable to actual wages, we did not present in the text quantitative estimates of the percentage change in relative wage differentials attributable to institutional wage fixing. In this appendix, partial information on institutional wage fixing, taken from cost-of-living agreements, is used for a quantitative explanation of changes in wage differentials.

Let us assume for the moment that we have data on institutional wage fixing to be compared with actual wages. A discrepancy between an institutional and actual wage change for a given group of workers might be attributed to chance and therefore would not tell us much about the relationship between the wage policy and actual wage developments. But assuming that these discrepancies are due to random errors, this relationship could be studied by averages of institutional and actual wage changes for all the relevant groups of workers.

This approach is similar to that of the wage-drift studies:[1] we attempt to explain the development of actual wages by institutional wage fixing, and determine the proportion of wage changes that are left unexplained. However, this approach suffers from a conceptual difficulty — the absence of a clear-cut distinction between institutionalized and non-institutionalized wage determination processes. Since all wage determination processes in a modern economy are institutionalized in some sense — although with different degrees of centralization — the distinction is arbitrary.[2] Therefore, the meaning of the wage-drift concept is not necessarily the same for all wage studies, and should be carefully elaborated in every case.

[1] See B. Hansen and G. Rehn, "On Wage-Drift," in *25 Economic Essays*, Stockholm, pp. 87–138.

[2] *Ibid.*, p. 101. Also H.A. Turner, "Wages: Industry Rates, Workplace Rates and the Wage-Drift," in *The Manchester School of Economic and Social Studies*, May 1956, pp. 95–123. Even if we find a logical basis for a clear-cut distinction, there exists the possibility that central institutions plan wage increases to be executed by decentralized units.

For the purpose of wage studies in Israel, it is probably useful to distinguish between determination of cost-of-living allowances on the one hand and that of the remaining wage components on the other. Cost-of-living allowances are determined centrally, while other wage components are generally subject to variations according to specific agreements — on an industrial, local, firm, and, in some cases, even an individual basis. Any central tendency change in the wage policy of the Histadrut (the General Federation of Labor) should be reflected mainly in cost-of-living allow-

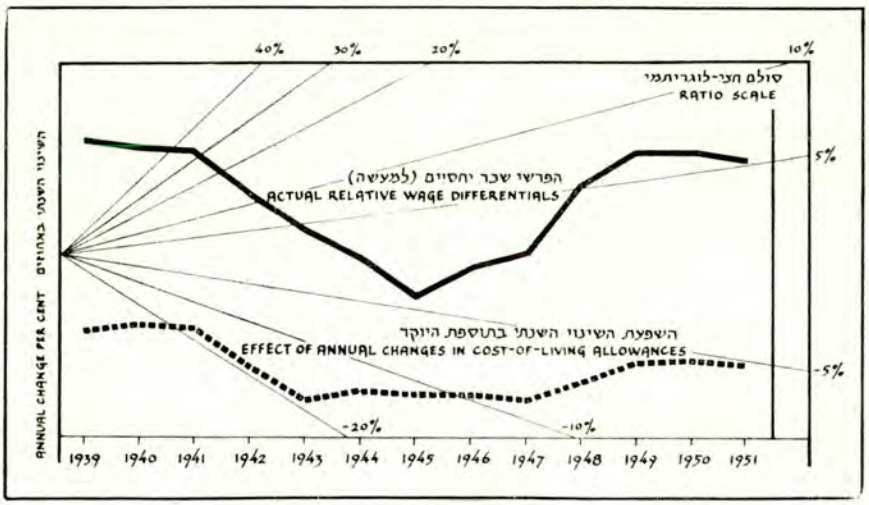

FIGURE B-1. *Relative Wage Differentials in Industry, Explained by Cost-of-Living Allowances*

SOURCE: Appendix Table C-8.

ances — while the fixing of other wage components could be regarded as adjustments which are found to be appropriate in particular cases.

Let us therefore compare the actual changes in relative wage differentials with the hypothetical changes due to cost-of-living allowances. This comparison is presented in Figure B-1. The first curve represents averages of relative wage differentials as computed from actual wage data for the period 1939–51, and the second curve represents the averages of relative wage differentials computed from hypothetical wage data: starting from actual industrial wages for the base years 1943 and 1947, data for the other years

(1939–47 and 1947–51) were computed according to the effect of cost-of-living allowances on each industrial wage.[3]

If all changes in wage differentials had been introduced through cost-of-living allowances, the curves should have been parallel. Figure B-1 shows, however, that other factors also contributed to changes in the wage structure. But when we compare the slopes of the two curves in the various years, it is clear that cost-of-living allowances provide a comparatively good explanation for the movements of relative wage differentials during 1939–43. On the other hand, the allowances cannot explain even the direction of wage differentials change during 1944–47, and can explain only about a third of the increase of relative wage differentials in the period of mass immigration.

[3] Cost-of-living agreements permit us to compute wages (basic rates plus allowances) for each year and each basic rate of the individual worker.
Preparing the data for Table 5, we computed wages for groups of workers — men and women — in each industry as if all members of each group had the same basic rate, equal to the mean basic rate of the group. Another simplified assumption made in the course of these computations was that basic rates and cost-of-living allowances were the only wage components in 1943, and 65 per cent of male wages and 80 per cent of female wages in 1947.
Computations of male and female wages in each industry have been carried out by applying weights and female-male wage ratios from outside sources to the average industrial wages of 1943 and 1947. These sources were — for 1943: G. Cyderovich and D. Gurevich, *Investigation into Workers' Wages and Earnings in Jewish Industry, 1943*, Jerusalem 1945 (Hebrew) p. 18; for 1947; Histadrut, *Survey of Wages in Industry, 1948* (Hebrew).
Because of the lack of weight estimates for later years, Figure B-1 was not extended to 1955–58.
For cost-of-living allowance computations, see Appendix Table A-2.

APPENDIX C

STATISTICAL SUPPLEMENT

TABLE C–1. *Labor Force and Capital Stock: 1948–60*

	Civilian labor force		*Capital stock*[a]		*Capital*[b] *per member of labor force (IL)*			
					Gross stock ÷		*Net stock ÷*	
	Total (*thousands*)	*Jews*	*Gross* (*millions of 1957 IL*)	*Net*	*Civilian labor force*	*Civilian labor force* plus *immigrant camps*	*Civilian labor force*	*Civilian labor force* plus *immigrant camps*
1948	—	221.5						
1949	342.9	310.0	2,130.0	1,496.6	6,725	6,407	4,824	4,596
1950	450.1	412.5	2,483.3	1,812.5	6,175	5,887	4,630	4,414
1951	545.0	505.8	3,073.9	2,354.3	6,272	6,137	4,886	4,780
1952	584.0	543.3	3,762.6	2,970.9	6,942	6,872	5,500	5,444
1953	598.6	556.3	4,346.0	3,452.8	7,660	7,635	6,085	6,065
1954	608.6	564.2	4,831.0	3,836.7	8,373	8,373	6,646	6,646
1955	619.3	573.9	5,351.1	4,245.2	9,174	9.174	7,260	7,260
1956	646.1	598.9	6,005.7	4,742.2	9,810	9,810	7,717	7,717
1957	675.3	626.5	6,668.8	5,228.2	10,427	10,427	8,168	8,168
1958	695.1	648.8	7,407.8	5,798.8	11,220	11,220	8,575	8,575
1959	711.2	661.1	8,188.6	6,395.2	12,106	12,106	9,150	9,150
1960	732.5	680.3	9,027.1	7,018.8				

[a] Beginning-of-year estimates.

[b] Mid-year estimates obtained by interpolating beginning-of-year figures.

SOURCES: Labor force data —A. Hovne, *The Labor Force in Israel*, FP, Jerusalem, 1961, pp. 12–13, 22. From 1954 the data are based on the CBS labor force surveys.

Capital stock data —A. L. Gaathon, *Capital Stock Employment and Output in Israel, 1950–1959*, Bank of Israel Research Department, Special Studies No. 1, Jerusalem, 1961, p. 3; see also footnote 11 on p. 12 above.

TABLE C–2. *Nominal Wage Movements: 1948–58*
(*Index, 1954 = 100*)

	1948	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*	*1957*	*1958*
1. Daily average wage in industry	27.3	32.0	34.3	41.0	65.2	86.6	100.0	111.8	127.5	142.1	152.1
2. Daily average earnings in all sectors			37.5	42.7	66.3	87.3	100.0	110.5	124.7	135.2	142.3
3. Monthly average earnings of urban employees				36.0			100.0			127.0	

SOURCE: Line 1 — CBS, *Statistical Bulletin of Israel* (general statistics), I (1949) 124, 484, and *Statistical Abstract of Israel*, various issues.
Line 2 — A. L. Gaathon, *op. cit.*, Table H–2, p. 129. For 1950–54, wage earnings per employee in industry and selected wage rates in agriculture, construction and transportation, weighted by number of employees in 1958.
Line 3 — G. Hanoch, "Income Differentials in Israel," in *Fifth Report 1959 and 1960*, FP, Jerusalem, 1961, p. 57, Table 4.

TABLE C–3. *Real Wage Movements: 1939–58*
(*Index, 1954 = 100*)

	1939	*1940*	*1941*	*1942*	*1943*	*1944*	*1945*	*1946*	*1947*	*1948*	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*	*1957*	*1958*
1. Daily average wage in industry	4.9	5.1	5.6	7.9	12.5	14.9	17.7	21.0	23.1	27.3	32.0	34.3	41.0	65.2	86.6	100.0	111.8	127.5	142.1	152.1
2. Consumers' Price Index	11.9	14.1	16.7	23.2	27.8	28.3	30.3	31.9	32.4	40.4	41.5	38.4	44.0	69.5	89.0	100.0	105.9	112.7	120.0	124.0
3. Real daily average wage in industry	41.2	36.2	33.5	34.1	45.0	52.6	58.4	65.8	71.3	67.6	77.1	89.3	93.1	93.8	97.3	100.0	105.6	113.1	118.4	122.7
4. Real monthly earnings of urban employees												97.7	96.7	95.4	97.9	100.0	104.4	110.9	112.7	114.7

SOURCE: line 1 — See source of line 1 in Table C–2.
line 2 — Jewish Agency, *Alon Statisti*, II, p. XIV and Statistical Handbook for Jewish Palestine, p. 318; CBS, *Statistical Abstract of Israel 1958/59*, No. 10, p. 284.
line 3 — line 1 *divided by* line 2.
line 4 — line 3 of Table C–2 *divided by* line 2 of this table.

TABLE C–4. *Wages and Equipment Prices: 1943–58*
(*Index, 1954 = 100*)

	1943	*1944*	*1945*	*1946*	*1947*	*1948*	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*	*1957*	*1958*
1. Nominal daily average wage in industry	12.5	14.9	17.7	21.0	23.1	27.3	32.0	34.3	41.0	65.2	86.6	100.0	111.8	127.5	142.1	152.1
2. Prices of industrial equipment	9.7	10.3	10.9	11.5	13.7	..	16.7	17.3	18.9	51.2	76.7	100.0	109.0	116.6	122.2	124.0
3. Relative price of labor (1÷2)	128.9	144.7	162.4	182.6	168.6	..	191.6	198.3	216.9	127.3	112.9	100.0	102.6	109.3	116.3	122.7

SOURCE: Line 1 — line 1 of Table C–3.
Line 2 — A. L. Gaathon, *The Estimate of Depreciation in Israel's National Accounts*, Bank of Israel, *Bulletin No. 11*, 1959, p. 51, Table 8, and p. 55, Table 10.

TABLE C–5. *Wages and Import Prices*: 1950–58
(*Index 1954 = 100*)

	1950	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*	*1957*	*1958*
1. Nominal daily average wages in industry	34.3	41.0	65.2	86.6	100.0	111.8	127.5	142.1	152.1
2. Import prices	22.7	27.3	66.2	83.0	100.0	121.8	129.3	134.7	127.5
3. Relative price of labor (1÷2)	151.1	150.2	98.5	104.3	100.0	91.8	98.6	105.5	119.3

SOURCE: line 1 — line 1 of Table C–3.
line 2 — Don Patinkin, *The Israel Economy: the First Decade*, FP, Jerusalem 1960, p. 47, Table 13.

TABLE C–6. *Industrial Wages and Professional Earnings: 1948–57*

(*Index, 1954 = 100*)

	1948	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*	*1957*
1. Nominal daily average wage in in industry	27.3	32.0	34.3	41.0	65.2	86.6	100.0	111.8	127.5	142.1
2. Annual income of salaried graduates	20.1	23.7	28.2	37.8	57.5	75.7	100.0	116.1	147.7	171.8
3. Relative price of professional services (2÷1)	73.6	74.1	82.2	92.2	88.2	87.4	100.0	103.8	115.8	120.9

SOURCE: line 1 — line 1 of Table C–3.
line 2 — R. Klinov-Malul, *The Profitability of Investment in Education*, (unpublished) — working papers.

TABLE C–7. *Relative Wage Differentials in Industry: 1939–45, 1945–51 and 1955–58*[a]

1939–45 (1943 = 1)		*1945–51 (1947 = 1)*		*1955–58 (1955 = 1)*	
1939	1.767	*1945*	0.774		
1940	1.697	*1946*	0.911		
1941	1.644	*1947*	1.000		
1942	1.262	*1948*	1.554	*1955*	1.000
1943	1.000	*1949*	1.914	*1956*	1.209
1944	0.839	*1950*	1.901	*1957*	1.319
1945	0.664	*1951*	1.808	*1958*	1.408

[a] The ranking for each computation was obtained from data for the respective periods.

SOURCE: Calculated from
Jewish Agency, *Alon Statisti* I, pp. 82–83; II, p. XIII;
CBS, *Statistical Bulletin of Israel* (general statistics) I, p. 484; II, p. 259; IV, p. 101, and *Statistical Abstract of Israel 1958/59*, No. 10, p. 175.

TABLE C–8. *Relative Wage Differentials in Industry, Explained by the Cost-of-Living (COL) Allowances: 1939–51 (1947 = 100)*

	Actual wage differentials	*The effect of the yearly change in COL allowances*[a]
1939	206	156
1940	198	161
1941	192	158
1942	147	125
1943	117	100
1944	98	106
1945	77	103
1946	91	103
1947	100	100
1948	155	112
1949	191	127
1950	190	129
1951	181	126

[a] Relative wage differentials calculated by holding constant components other than cost-of-living allowances.

SOURCE: See sources to Table C–7, and Appendix B, footnote 3.

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ABOUT THE AUTHOR

Dr Uri Bahral studied at the Hebrew University and took his M.A. degree in Economics and Statistics in 1957. He received his Ph.D. in 1962.

Dr Bahral, who is at present the director of a department in the Central Bureau of Statistics, has worked for the Ministry of Commerce and Industry, and for the Prime Minister's Office. Between 1957 and 1962 he taught at the Hebrew University, except for 1960 when he was a research assistant at Stanford University, California.

Among the other works of the author are: "Wage Differentials and Specification Bias Estimates of Relative Labor Prices," in *The Review of Economics and Statistics*, November 1962 (and also as a research article of the Falk Project for Economic Research in Israel), and *Cost per Dollar Earned in Israel*, published by the Ministry of Commerce and Industry in 1956 (in Hebrew).