An Economic Analysis of the Palestinian Economy: The West Bank and Gaza, 1968-1991[#]

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Abstract

This paper presents a macroeconomic framework of the Palestinian economy and analyzes the main economic processes that began after the 1967 war. The driving force behind these processes was the interaction between two very different economies which met at the market place. The rapid rise in standards of living until 1987 was led by high employment in Israel, while domestic growth of output was more limited. In an economic environment free of controls, it is not obvious that income gaps between such different economies should have been narrowed mainly through labor flows. Part of the adjustment could have taken place through capital movements and trade in goods. However much of the adjustment occurred through labor movements to Israel, reflecting an unbalanced economic interdependence with Israel. In spite of growing standards of living and high saving rates, only a small share of savings was channelled into productive investment and as a result industry hardly contributed to economic growth. Instead, small scale residential investment constituted an important instrument of saving partly due to the absence of a well functioning banking system. The outbreak of the Intifada halted the growth process in the Westbank. Output and especially incomes fell sharply, compared to their potential, as approximated by the model's forecast. The effect on the Gazan economy has been left for future research. The present framework also helps in analyzing alternative strategies of the economy at the outset of the new political situation of self-government.

I. Introduction

The West Bank and Gaza came under Israeli control twenty six years ago, during the war in June 1967. Since then much economic research on the two areas has accumulated.[1] However, until recently most studies did not provide an overall macroeconomic analysis of the two economies, based on empirical work.[2] In this study we hope to contribute to the closure of this gap.[3]

The macroeconomic framework presented here can also have useful applications, besides their contribution to the general understanding of the economy: It allows for an estimation of the main economic effects of the Intifada.[4] It also helps in determining the starting point of the economy at the outset of the structural changes that will undoubtedly occur under the new political situation of some sort of self-government. Furthermore it can be instrumental in analyzing alternative strategies for future economic development in the

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[1] The major developments over the observation period are described in Bregman (1974, 1976) Litvin (1980), Meron (1980, 1982) and Zakai (1984, 1986, 1988).

[2] Exceptions to this are Baums (1989) for the Westbank, Fishelson (1989) for Gaza and Sagi, Sheinin and Perlman (1992) for the Westbank and Gaza.

[3] When referring to the Palestinian economy we mean the economy of the Arab population in the Westbank and Gaza, not including the Golan Heights, East Jerusalem and the Jewish Settlements outside the "green line" (the frontiers of the armistice of 1948). Furthermore the data exclude the north of Sinai (mainly the 30,000 inhabitants of El Arish) from May 1979 onwards and the 7000 inhabitants of the Rafah area from April 1982 onwards, when control over these areas was handed over to Egypt as part of the Peace treaty.

[4] Since the beginning of the Intifada in December 1987 data collection was disrupted . Particular difficulties occurred in collecting figures on trade, but also in households' responses to the quarterly household surveys. Employment data became less reliable due to increased temporary absence of employed persons. Consequently the CBS now collects also information on hours worked. The same difficulties apply to private consumption of agricultural goods - estimated from the domestic market supply, domestic production and imports (mostly from Israel) - and of industrial goods, estimated from the family-survey and from import statistics. Due to the deterioration in data collection (both quantitative and qualitative), the CBS has recently chosen to report only limited data and sometimes estimated ranges rather than precise numbers.

West Bank and Gaza.

Most researchers of the Palestinian economy regard the series collected and published by the Israeli Central Bureau of Statistics (CBS) as the most consistent and reliable source of data on the West Bank and Gaza.[5] Our calculations and analysis rely solely on this database. However the CBS itself cautions users of these data on their limited quality, in particular regarding the estimation of imports and exports between the Palestinian economy and Israel.[6] Since the National Accounts statistics are affected by trade statistics, the data problems are reflected there as well.

Several economic processes began immediately after the war in 1967 (Kleiman 1990). The driving force behind them was the fact that two very different economies met at the market place. The sudden disconnection from the Jordanian and Egyptian economies on the one hand[7] and immediate opening toward the Israeli economy on the other hand, set off several major economic processes.

1. At the beginning of the period the combined GDP of the West Bank and Gaza accounted for only about 3.5 percent of the combined GDP in the West Bank, Gaza and Israel. By 1987 its relative size had grown to some 5 percent, reflecting a higher average growth rate of GDP than in Israel (table 1). Even more striking was the improvement in the standard of living as reflected in private consumption per capita over this period: at the beginning it was about one quarter of Israeli consumption in the West Bank and only 15 percent in Gaza. By 1986/7 private consumption per capita had reached nearly 1/3 of the Israeli level in the West Bank and 22 percent in

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[5] Hamed and Shaban (1991), while using CBS data, criticize them strongly.

[6] Trade data on goods and non-labor services with Israel are recorded by sampling at the main passages ('belt survey') and are considered a poor estimate of actual trade, in particular for the Westbank.

[7] For the West Bank the separation from Jordan was somewhat more gradual due to the 'Policy of Open Bridges' adopted by Israel since the 1970's. This policy left an open link between the Westbank and Jordan, over the Jordan river bridges, where people could move, and (mainly agricultural) products could be exchanged between the West Bank and Jordan, though under Israeli control.

Gaza. The reduction in the growth rate of GDP and the sharp fall in consumption per capita in Gaza thereafter provide a rough indication on the effect of the intifada on economic developments in the Palestinian economy.

2. Palestinians living in the West Bank and Gaza entered the Israeli labor market, where wages for comparable work exceeded those at home by much (see figure 1).[8] While workers moved rapidly into the Israeli labor market, wage differentials declined much more slowly, vanishing in the mid seventies to pick up again in the second part of the 1980's.[9] The dependence of Palestinians on working in Israel remained high throughout the years - more than half of the wage earners continued to work in Israel until 1991. Employment, including self-employed, constitutes about 1/3 of total employment for the West Bank and somewhat more for Gaza.

3. Dependence on the Israeli economy was typical for both the labor and the goods market. Openness, as measured by the ratio of imports to GDP, was considerable already in 1968 and grew even more in Gaza (figure 2). Israeli manufacturers started selling products to the Palestinian population, capturing a large market share; imports from Israel (including imports in transit through Israel, whose share is unknown) accounted for about 90 percent of total goods imports to the Palestinian economy. In contrast, the share of exports in GDP remained well below import growth both in the West Bank and Gaza. In both areas most of the trade in goods was with Israel. In the period 1975 to 1986 an average of about 60 percent of the Westbank's goods exports and more than 70 percent of exports from Gaza were sold to Israel.

4. In spite of growing standards of living and high saving rates, investment in productive assets remained very low. After an initial short increase, the capital/output ratio of

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[8] See also related work on the labor market, though not in a comprehensive macroeconomic framework, by Kleiman (1992a), Angrist (1992) and Fishelson (1992).

[9] In this analysis wage differentials refer to the gap between wages paid to Palestinian workers in Israel and in the domestic economy. However another wage gap, not analyzed here though not less important, is that between wages paid to Israeli workers and Palestinians working in Israel.

the business sector has been deteriorating, while the GDP-share of residential construction, reflecting largely unproductive capital stock, is estimated to have increased rapidly over time (figure 3).[10]

The stylized facts (especially figure 1) reveal that this was not a uniform period. It can be divided into three sub-periods: (1) the period from 1968 to 1973, when the adjustment to the separation from the Jordanian and Egyptian economies and simultaneous integration with the Israeli economy took place; (2) the period from 1974 to 1987, in which the basic structure was consolidated and (3) the period thereafter, marked by the beginning of the Intifada.

We explain these stylized facts partly by using estimated macroeconomic relationships of the economies of the West Bank and Gaza and partly by heuristic observation. The framework emphasises the supply-side and treats also the demand-side. Employment is derived from the supply and demand for labor, the quantity of capital is derived from productive investment.[11] Together these factors of production determine GDP, through an aggregate production function. The domestic demand for labor is conventionally derived from the production function, the supply of labor is determined in conjunction with employment opportunities in the Israeli economy.[12] The labor market, separated from a comprehensive framework of the economies, was also analyzed by Kleiman (1992a), Fishelson (1992) and Angrist (1992). On the demand side, consumption is modelled conventionally, whereas investment needs to account for the low stage of development of

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[10] The CBS does not publish an estimate for GDP of the business sector. The present ratio uses total GDP and is therefore downward biased.

[11] Since there are no official published series available, we calculated the capital stock from investment data. Several assumptions were necessary, such as the life span of equipment, the size of different categories of investment prior to 1968 (when no separate data existed on the Westbank and Gaza), the breakdown of investment in construction into housing and buildings for business etc.

[12] A more complete specification should include the Jordanian and other Arab labor markets as well (see Fishelson 1992). However the analysis here excludes these workers both in employment and labor force figures.

the domestic capital market and the political situation. The Palestinian economy is not only constrained by the limited access to foreign capital markets, but also lacks a well functioning domestic capital market. Therefore the most important source of funds for investment in the Palestinian economy is its own private savings. Due to this and other factors, discussed below, their impact on growth has been relatively small. Consumption and investment of the public sector are assumed to be exogenous. Import demand is assumed to depend on relative prices and the various uses - consumption, investment etc. Exports are treated as a residual from total resources and uses, due to the low quality of the trade data, as mentioned above. The difference of our approach from that adopted by Baums (1989), Fishelson (1989) and Sagi et. al. (1992) lies mainly in our emphasis on the supply side, neglected in the other models. The demand side determines the composition of the uses - namely the decisions on consumption, savings and investment.

The empirical results, both for the labor market and the macroeconomic structure are consistent with each other, and provide reasonably good estimates for employment of Palestinian workers in the West Bank, as well as for production, investment and consumption there. For Gaza the results are less satisfactory, though the stylized facts resemble those of the Westbank. A further improvement on the results for Gaza is left for future work.

The consumption function for the Westbank is well behaved. Private savings, which were relatively high, were mainly channeled into investment in residential buildings rather than productive assets. Investment in equipment was discouraged not only by political uncertainty and administrative intervention, but also by the low stage of development of the financial system, which put obstacles before the transmission of savings into productive investment.

We argue that the persistence of the wage gap between Palestinian wages paid at home and in Israel reflects a structural distortion mainly of the industrial sector in the two areas, caused in part by their limited access to the Israeli goods market.

The rapid rise in standards of living until 1987 was driven largely by high employment in Israel and unilateral transfers from abroad, while domestic growth of output

was more limited. In the hypothetical case of an economic environment free of controls, it is not obvious that income gaps between the Palestinian and the Israeli economies should have been removed mainly through labor flows. One could rather have expected at least part of the adjustment to take place through capital movements from Israel to the West Bank and Gaza and through trade in goods - labor-intensive goods exports from the Palestinian economy and more capital-intensive goods imports from Israel. However much of the adjustment occurred through labor movements to Israel, reflecting an unbalanced economic interdependence with Israel.

The paper is divided into five sections. After the introduction, the supply side (including the labor market) is described in section II and the demand side in section III. In the fourth section we report on the empirical results, estimated separately for the West Bank and Gaza for the years 1968 to 1986. The year of 1987 was left for an - admittedly limited - evaluation of the model's predictive power. The reason for this periodisation is the outbreak of the 'intifada' at the end of 1987. In section V we then estimate the economic cost of the Intifada from the comparison of actual economic developments with a hypothetical forecast, based on the estimated macro-economic relationships over the relatively normal period till 1986.

II The Supply Side: Production and the Labor Market

We assume a Cobb-Douglas production function, relating output (Y) to capital (K) and domestic employment[13] (E_h) as factor inputs.

[13] The present analysis does not explicitly discuss unemployment, which was low until the outbreak of the intifada. The terms 'employment' and 'labor supply are thus used interchangeably.

$$Y = AK^{\alpha}E_h^{\beta} \tag{1}$$

The capital stock is defined as

$$K_t = (1-\delta)K_{t-1}+I_{eqb} \tag{2}$$

where I_{eqb} = net investment in equipment and business construction and K_t is the corresponding business sector stock of capital at the beginning of period t.

The demand for labor by domestic employers (L_h^d) can be derived from production technology, assuming that marginal labor productivity equals the domestic wage rate (w_h):

$$L_h^d = \left(\frac{\beta A K_t^{\alpha}}{w_h}\right)^{\frac{1}{1-\beta}} \tag{3}$$

The Palestinian supply of labor needs to account for both the domestic (L_h^s) and the Israeli labor market (L_i^s). A person seeking employment can choose to work in either one of them.[14] We hypothesize that Palestinian labor supply at home depends both on the domestic wage and the wage paid in Israel. Furthermore it depends on the disutility attributed to working in Israel (ε) and on population size.

[14] In the first few years after the oil shock of 1973, Israeli demand for labor services from the territories declined with economic activity, whereas in Arab oil producing countries, the opposite happened. During this period, Palestinian emigration indicates that workers probably responded to this change. Equations of labor supply in Fishelson (1992, p.16) however do not support such migration.

$$L_h^s = L_h^s(w_h, w_i, \varepsilon, n) \quad \begin{matrix} + & - & + & + \end{matrix} \tag{4}$$

Palestinian labor supply in Israel is assumed to depend on the same variables but with opposite signs with respect to wage rates and the disutility factor. Given the relatively large size of the Israeli labor market, we assume that the Israeli wage rate is exogenous. Total Palestinian labor supply is given by

$L^s = L_h^s + L_i^s$. Equilibrium in the domestic labor market is achieved when

$$L_h^S = L_h^d \tag{5}$$

The comparative static features of the equilibrium solution[15] imply that domestic wages rise with Israeli wages, with a growing capital stock, and fall with a growing population and increasing disutility from work in Israel.

$$w_h = w_h(w_i, k, n, \varepsilon) \quad \begin{matrix} + & + & - & - \end{matrix} \tag{6}$$

[15] The comparative statics can be derived from the implicit function $Z = L^s_h(.) - L^d_h(.)$. The change in Israeli wages - for example - raise domestic wages

$$\frac{\partial w_h}{\partial w_i} = -\frac{\dfrac{\partial L_h^s}{\partial w_i}}{\dfrac{\partial L_h^s}{\partial w_h} - \dfrac{\partial L_h^d}{\partial w_h}} > 0$$

III The Demand Side

1. Private Consumption

According to the Keynesian hypothesis, private consumption (C) is a function of households' disposable income (DI). Alternatively, the Permanent Income or Life-Cycle hypotheses stress the importance of the concept of permanent income, based on consumers' ability to smooth consumption over time. The rate of interest, wealth and the share of short-term liquid assets in wealth - also typically found in consumption functions - are problematic in the context of the Palestinian economy. The capital market, through which effects of interest rate and wealth are supposed to be transmitted, has been at a premature stage throughout most of the observation period. Wealth in the form of hoarded liquid assets outside the banking system may nevertheless play a role in consumption behavior.

$$C = C(DI, Wealth) \tag{7}$$

where DI ≡ Y - NFP - NTI - TD + TFG + UTF, NFP = net factor payments abroad, TI = indirect taxes, TD = direct taxes, TFG = net domestic transfer payments and UTF = net unilateral transfer payments from abroad.

Factor payments from abroad reflect mainly wages from Palestinian employment in Israel. The latter is obtained as the difference between total labor supply less unemployment and domestic demand for labor and from exogenous Israeli wages. Indirect taxes are assumed to depend on consumption, and direct taxes on GDP. Unilateral transfers are assumed to depend positively on cumulative migration.

2. Investment Demand and Savings

A standard investment function usually includes variables such as the expected change in output, the interest cost of capital goods, which is the opportunity cost incurred by tying up funds, depreciation, depending on the size of the existing capital stock, and business profits. However, as mentioned above, the high savings were not channeled into productive investment - the capital/output ratio of the business sector has been declining over a long period, while the residential capital stock, which is basically unproductive, increased rapidly over time. A possible explanation for this fact could be that unlike in developed economies, where households face several alternative savings instruments, in a financially constrained economy saving takes place mostly in the form of hoarding currency, raw materials or self-financed investment. We argue that small scale residential investment has played such a role of a savings instrument in the Palestinian economy. Since a large number of the Palestinian workforce acquired the skills needed in the construction sector, through the strong demand for construction work in Israel, the small scale entrepreneurship in this sector constituted a safe way to channel own savings in the absence of a well functioning banking system. In such a situation much of the investment activity is likely to be determined by the amount of own financial resources, depending mainly on own savings, and perhaps including loans from family and close friends. Furthermore, political uncertainty and administrative restrictions imposed by the military authorities overshadowed economic considerations concerning investment.[16] Due to these constraints, which operated on investment, it is unlikely to expect standard investment functions to explain investment behavior in the Palestinian economy. Given the limited access to foreign capital markets (including the Israeli market) and the relatively balanced public sector accounts (of the Israeli 'Civil Administration'), the size of investment is expected to be highly correlated with domestic private savings, which

[16] Arieh Beckenstein (1987, p.9., Hebrew) acknowledged that administrative measures were applied at times for the protectionist purpose of reducing the competitiveness of Palestinian firms, particularly in industry. This policy has recently been abandoned in favor of a more liberal approach towards Palestinian industry.

constitute its major constraining factor.[17]

3. The Demand for Exports and Imports

Typically exports are assumed to depend on foreign demand for the goods produced at home and on their relative price compared to that of the main competitors abroad. However, for reasons explained above, exports will be treated as a residual:

$$X = Y+IM-C-I-G \quad (8)$$

where IM = imports and G = government consumption.

The demand for imports is a derived demand, assumed to depend on the various components of demand. Furthermore it depends on the relative price of imports and GDP.

$$IM = IM(C,I,G,X,EPM) \quad (9)$$

[17] This approach is in the spirit of the literature sparked off by Feldstein and Horioka (1980).

IV Empirical Results: 1968 to 1986

In this section we shall try to explain the stylized facts, noted in the introduction, as well as some more specific phenomena: (1) Labor productivity in industry has stagnated relative to that in other sectors (figure 4). (2) The rate of unemployment decreased rapidly with the new opportunities offered in the Israeli labor market. However, the rate of non-working persons, as percentage of the working-age population, increased rapidly since 1975 (figure 5).

A. The West Bank

The economy exhibits a well-known two-year "olive" cycle.[18] The cycle is not restricted to olive oil output and changes in stocks of olive oil, but extends visibly to total output, labor demand, private savings and - to a lesser degree - to changes in private consumption (figure 6). In contrast, the level of private consumption behavior has been much more stable.

1. The Supply Side

Prior to the estimation of the production function , we need an estimate of the productive capital stock (equipment and business sector buildings). Due to the lack of investment data before 1968, a number of assumptions concerning past investment need to be made, which strongly affect the outcome. We assume (1) that in the past the long run growth rate of gross investment was 3.5 percent per year, (2) that total gross investment in equipment for 1967 was only 70 percent of the level in 1968, mainly due to the war in 1967 and the political tension preceding the war, and (3) that the average life span of machinery

[18] There exists also a more pronounced six-year cycle which occurred in 1974, 1980, 1986 and in 1992. These cycles are particularly pronounced in the "Syrian" species of olives, to which the Westbank-crop is related. The cycles are caused by the genetic code of the specific species and may be affected by circumstantial factors, for example weather conditions (based on an internal memorandum by V. Shay (1993)).

was relatively long - 14 years, mainly due to delayed replacement.[19] Labor input is the number of employed persons.[20]

The OLS estimate of a log-linear form of equation (1) yields:[21]

$$gdp = -0.06 + 0.62\ k_{eqb} + 0.68\ e_h$$

(-0.1) (20.7) (2.6)

Adjusted R^2 = 0.97; D.W. = 2.59; Period: 1968 -1986

As can be inferred from the residuals, this regression does not take sufficient account of the olive cycle, although some of the variability in employment is caused by it. We thus added a dummy variable for the olive cycle. Furthermore we included a dummy variable for the negative effect of the war and oil price shock in 1973.

$$gdp = 0.95 + 0.63\ k_{eqb} + 0.44\ e_h + 0.06\ d_{olive} - 0.13\ d_{73}$$

(1.1) (29.3) (2.2) (2.8) (-2.4)

Adjusted R^2 = 0.99, D.W. = 2.41, Period: 1968 - 1986

The dummy variable for the olive cycle significantly affects output in excess of its

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[19] According to Mazur (1979, p.55) real gross investment in Jordan grew by an average annual real rate of 9 percent during the early sixties. However, a report on the economic development of the Westbank, by the Israeli Authority of Economic Planning (1967) mentions that the Westbank was developing at a considerably slower pace than the Eastbank. In that report investment in the Westbank for 1966 was estimated at about 10 million dinars, which compare to about 18 million Shekels at 1986 prices. Our estimate, which is somewhat lower, is based on the mentioned assumptions and derived backwards from 1967.

[20] It would have been preferable to use the number of hours worked or the number of working days. However, data on hours worked have only been made available for recent years. Furthermore, in the process of actual estimation we realized that it is important to distinguish between paid, unpaid workers, and self-employed. We thus would have needed the breakdown of hours worked accordingly.

[21] It would be preferable to analyze business sector GDP, which differs from total GDP by the value added from ownership of dwellings and public sector services. However such data are not readily available and require further work.

In all the equations the numbers in parantheses below the coefficients are t-values.

employment effect.

A test on the coefficient of e_h shows that the constant returns to scale hypothesis cannot be rejected.[22] This implies that the elasticity of output to labor is somewhat lower than the capital elasticity. Investment should therefore be a crucial element in any growth strategy of the economy. However this result is not stable over different subperiods. A s mentioned earlier, the demand for labor is derived from the estimated production function. As can be seen from equation 3 this requires knowledge of the wage rate at the margin, since we assume that the wage equals the marginal product of labour. However the reported wage rate in the labor market survey does not take into account the fact that about 10 percent of the employed in the home economy are not paid a salary (e.g. family members working and living in a farm). We therefore calculated a somewhat lower "shadow" wage, which accounts for these lower wage costs than those reported in the labor statistics.[23]

The reduced form wage equation (9) stresses the dependence of the domestic labor market on the Israeli labor market. The disutility variable is difficult to quantify and probably did not play an important role before the Intifada.

$$w_h = -12.4 + 0.34\, w_i + 0.006\, k_{eqb} + 28.1\, n_{w.age/n}$$

$$(-0.7) \quad (2.1) \qquad (5.6) \qquad (0.9)$$

Adjusted $R^2 = 0.93$, D.W. = 0.9, Period: 1970 - 1986

The proportion of working age population in the population ($n_{w.age/n}$) appears with the wrong sign and the D.W - statistic indicates the presence of autocorrelation. After correcting for autocorrelation by a first order autoregressive process and dropping the population variable, the performance of the equation is improved.

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[22] $gdp = a_0 + a_1\, keqb + a_2\, e_h$. Let $a_1 + a_2 = 1 + \delta$. We can then write $gdp - e_h = a_0 + a_1\,(keqb - e_h) + \delta\, e_h$. The value for δ is not significantly different from zero (t-value: 0.35) and the hypothesis of CRS cannot be rejected.

[23] Unfortunately there is no data available on the level of such "subsistence wages". We assumed that they are about 1/4 of reported wages. The same wage was used for imputed wages of the self-employed .

$$w_h = 3.49 + 0.34\ w_i + 0.006\ k_{eqb};\ AR(1)\ \rho = 0.54$$

(1.8) (2.4) (4.8) (2.2)

Adjusted $R^2 = 0.94$; D.W. = 1.92, Period: 1971 - 1986

The coefficient of the Israeli wage rate is relatively stable, however the correction for autocorrelation probably hides a more basic problem of misspecification of the equation: In the following we argue that this equation ignores structural issues, related to different sectors in the domestic economy.[24]

As mentioned above, wage differentials persisted between the domestic and the Israeli labor market, despite the rapid movement of Palestinian workers into the Israeli labor market. Though figure 1 seems to suggest three sub-periods - adjustment (1970 to 1975), 'equilibrium' (1976 to 1987) and renewed wage gap thereafter - we argue that the workers' rapid movement between labor markets suggests that the adjustment in employment was completed already by 1972. This cannot therefore explain the development of the wage gap. These seemingly contradicting facts reflect divergent structural developments.

In agriculture, the large initial wage gap caused a rapid movement of wage earners out of the sector and mainly into the Israeli labor market (figure 7). As a result the wage gap was significantly narrowed by 1973, eliminated later on and at times even reversed (figure 9). Of course this development forced producers to be more efficient and to adjust to the pace of technological change in Israeli agriculture, such as for example in irrigation, and probably also to get rid of much disguised unemployment. As a result, average employment productivity rose sharply over time (figure 4).

In the construction sector the development was similar, though significantly slower. The wage gap was eliminated only by 1976 (figure 9). Unlike in agriculture the movement of workers in this sector was not smooth. Instead it shows a strong anticyclical behavior with the share of West Bank-workers (out of total West Bank-workers) in the Israeli economy

[24] Another important factor may be the migration of workers to labor markets abroad, foremost in Arab countries.

(figure 10). This indicates that employment in domestic construction served as a buffer in times of reduced Israeli demand for Palestinian workers. Average labor productivity in this sector increased by much less than in agriculture and stabilized by the late 1970's. This probably reflects the fact that the cheap labor services supplied by Palestinian workers reduced the incentive of Israeli constructing companies to substitute labor for more capital intensive technology.

Unlike in agriculture and construction, wages in industry hardly converged at all throughout the observation period (figure 11). At the outset of the period the wage differential was nearly 90 percent and wage earners moved accordingly out of domestic industry. However the process was halted at an average gap of more than 40 percent (with the exception of 1980) while relative employment of wage earners stabilized at about 10 percent of total wage earners and average labor productivity stagnated at a low level. The slow development in industry probably reflects problems in different areas of the economy. The political (see Beckenstein, 1987) and financial environment was certainly not conducive to investment (discussed in Arnon and Gottlieb (1992). This development is consistent with the stagnating investment in equipment, though there is no sectoral breakdown available for investment. The industrial sector is then characterized by (1) persistence of wage differentials, (2) only little movement of wage-earners out of that sector and (3) stagnating investment, as approximated by equipment investment (except in the first years of the observation period), which caused the productive capital stock and labor productivity to stagnate. Accordingly, industrialists continued to pay relatively low wages since they could not compete with wages in comparable occupations elsewhere. In order to be consistent, this hypothesis implies that the quality of workers must have decreased over time. In other words, wage differentials disappeared in sectors, which either became more efficient (agriculture) or in which efficiency in the alternative Israeli market did not diverge by much from its counterpart in the West Bank (construction), whereas they remained in industry,

of employment as a whole (for the years 1979 onwards). The data show that those working in Israel have had a higher level of schooling per age-year than those working at home throughout the observation period. This probably explains at least part of the persisting wage differential between Israel and the Westbank (figure 12).

At this stage we can conclude, that the contradiction illustrated in figure 1 reflects the lack of economic development in industry.[25]

2. The Demand Side

a. Consumption demand

Households' consumption in the West Bank is significantly determined by present disposable income.[26]

$$C = 114.0 + 0.78\ DI - 65.3\ D_{olive}$$
$$(3.0) \quad (30.8) \quad (-3.0)$$

Adjusted $R^2 = 0.98$, D.W. = 2.01, Period: 1968 -1986,

However the negative coefficient of the dummy variable for the olive crop suggests that consumption nevertheless follows a steady and increasing consumption path, with transitory

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[25] The sectoral accounts usually do not match GDP data calculated from uses, the remainder being denoted as "errors and omissions". This reflects not only other sectors such as the public sector and other services, but also errors in data collection etc. Since it is difficult to calculate a relevant wage gap for this remainder and even more difficult to interpret it, we disregarded this residual.

[26] Estimating the same equation by 2SLS, using Gazan disposable income as an instrument for DI, hardly affected the result.

An approximation for wealth, calculated from cumulated savings (starting from 1968), also appears significantly in the equation, estimated by OLS:

$$C = 218.5 + 0.64\ DI + 0.046\ Wealth - 54.3\ D_{olive}$$
$$(3.9) \quad (9.8) \quad (2.3) \quad (-2.7)$$

Adjusted $R^2 = 0.99$, D.W. = 1.93, Period: 1968 - 1986.

income being smoothed by saving in years of high crop and dissaving in the other years.

The lack of an organized capital market contradicts the possibility of a permanent income approach. However, this merely implies that in such an economy consumers will tend to save in the form of liquid asset, such as foreign exchange deposits, etc. Savings and wealth can then perform as a shock absorber. Savings were relatively high - about 17 percent on average of total disposable income over the observation period, and reached nearly 25 percent in 1978 and in years of high income, often more than 20 percent, depending mainly on the olive cycle.

b. Investment demand

At first sight the following investment function seems quite satisfactory, although the return on capital (r) appears with the wrong sign[27]:

$$I_{total} = 140.2 + 0.40\ D(GDP) + 0.37\ K_{eqb}(-1) - 1.9\ r$$
$$\qquad\quad (0.5) \qquad (3.5) \qquad\qquad (2.2) \qquad\qquad (-0.7)$$

Adjusted $R^2 = 0.92$, D.W. = 1.15, Period: 1970 - 1986

However, as mentioned above, the composition of investment is heavily biased toward residential investment, which does not add to productive capacity. Business sector investment in equipment and buildings, which should respond to profitability (r) and to the accelerator D(GDP) unfortunately is not explained by these variables.[28]

As argued above, in a financially constrained economy the demand for investment

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[27] The return on capital (r) is calculated as the residual

$$\frac{(GDP - wagebill)}{Keqb}$$

[28] $I_{eqb} = 88.9 + 0.04\ D(GDP) + 0.05\ K_{eqb}(-1) - 0.3\ r$
$\qquad\qquad (1.0) \quad (1.0) \qquad\qquad (0.9) \qquad\qquad (-0.3)$

Adjusted $R^2 = 0.61$, D.W. = 1.33, Period: 1970 - 1986.

may be constrained by savings. In such an economy investment will be suboptimal and largely self-financed. In such a case the coefficient of savings should equal 1. Total gross investment yields the following relationship with savings[29]:

$$I_{total} = 3.4 + 1.2\ s\ ;$$
$$(0.1) \quad (6.8)$$

Adjusted R^2 = 0.71, D.W. = 1.26, Period: 1968-1986

This result might stem from the technical fact that changes in stocks in the West Bank are only recorded for olive oil. However, using fixed investment (which excludes changes in stocks), the coefficient still does not differ significantly from one.

If the hypothesis is correct, it is more accurate to explain total investment rather than only fixed investment since changes in stocks too could be financed by loans. However the result suggests that also fixed investment depends on current savings as might be expected in a financially constrained economy.

A common form of investment used for accumulating savings in the Palestinian economy is certainly construction. Indeed, the correlation coefficient between the logarithms of building investment and of wealth is 0.8.

c. Import demand

Imports were found to depend on relative prices (EPM) and on consumption (C) but not on other uses. In order to avoid a simultaneity bias, disposable income was used as an instrument for consumption and the lag of EPM for the relative price variable. The regression is in logarithmic form, except for the relative price variable.

---

[29] Using the same procedure as described in footnote 22 it can be seen from the t-value of s that the coefficient of s does not significantly differ from unity.

$$Im = -1.35 - 0.6\ EPM + 1.21\ C$$
$$(-3.3)\quad (-2.3)\qquad (15.7)$$
Adjusted $R^2 = 0.95$, D.W. = 0.9, Period: 1969 - 1986.

The weakness of this equation is obvious and probably reflects mainly the low quality of the balance of payments data as well as possible misspecification, which is hard to deal with.

B. Gaza

The Gazan economy resembles the West Bank economy in the basic stylized facts discussed above, except for the olive-cycle which is particular to the West Bank. However, despite the similarity of developments, their quantitative aspect differs enough to justify a separate empirical analysis.

1. The Supply Side

Production in Gaza is not satisfactorily explained:[30]

$$gdp = 3.4 + 0.44\ K_{eqb} + 0.06\ e_h$$
$$(1.9)\quad (13.1)\qquad (0.1)$$
Adjusted $R^2 = 0.91$, D.W. = 0.51, Period: 1968 - 1986

While capital appears to be significant, employment does not add to the equation's explanatory power. The residuals indicate that multifactor productivity affected growth negatively in the first two years after 1967. One possible explanation could be the existence of large-scale hidden unemployment, particularly at the beginning of the period. While such an effect is difficult to measure, its occurrence is likely, especially in an economy with many

[30] All variables are in logarithms and are defined as in the section on the WB.

refugees and in which much economic activity is influenced by various aid organizations. Such hidden unemployment is likely to have disappeared together with the rapid reduction in measured unemployment by 1972.[31] Dropping the adjustment period from 1968 to 1972 yields the following result:

$$gdp = 2.2 + 0.34\ k_{eqb} + 0.52\ e_h$$
$$(1.8) \quad (15.3) \quad (1.7)$$

Adjusted $R^2 = 0.95$, D.W. = 1.81, Period: 1972 - 1986

Like in the West Bank, the structure of the physical capital stock exhibits the continued lack of productive business investment and a disparately large stock of residential buildings (figure 3). The openness of the labor supply toward the Israeli labor market has been even more pronounced than in the West Bank. During the 1980's the share of Gazan workers in Israel reached nearly 50 percent of total Gazan employment as compared to 29 percent of employed West Bankers. This added to deepening the dependence of the Gazan labor force on the Israeli labor market, even more than that of the West Bank (figure 1). On the one hand this helped to raise the living standard in Gaza, which - as measured by average per capita consumption - rose by 6 percent per year. On the other hand the high Israeli wages, combined with the limited access to the Israeli goods market created similar structural problems as in the West Bank, in particular for industry.

The following wage equation reiterates the dependence of the domestic labor market on the Israeli labor market:

$$w_h = 7.3 + 0.46\ w_i + 0.015\ K_{eqb} - 6.7\ n_{w.age/n};\ AR(1)\ \rho = 0.38$$
$$(0.3) \quad (2.1) \quad (2.3) \quad (-0.1) \quad (1.6)$$

Adjusted $R^2 = 0.60$, D.W. = 1.88, Period: 1971 - 1986

[31] Indeed a proxy of such a variable, calculated on the basis of the measured rate of unemployment in the first 4 years after 1967 and set at zero thereafter, appeared significantly in the regression, though the coefficient of labor remained insignificant.

2. The Demand Side

Similarities between the two economies are also apparent on the demand side. In both areas the saving rate is relatively high (figure 13), however the rate for Gaza exceeded that of the West Bank for most of the period, until its unexplained sudden and sharp fall by 1984. A possible explanation of the existence of relatively high saving rates in financially constrained economy is given in Jappelli and Pagano (1992). In order to prevent possible liquidity shortages, it is argued that potential borrowers will tend to save more in an economy which cannot guarantee a satisfactory access to the capital market in time of need. Such a situation certainly applies to Gaza.

Private consumption is determined by disposable income. Using 2SLS procedure with disposable income in the Westbank as a proxy , we get an income coefficient of similar magnitude to that obtained for the Westbank:

$$C = 14.0 + 0.72\ DI$$

$$(0.4) \quad (13.2)$$

Adjusted $R^2 = 0.90$, D.W. = 0.8, Period: 1968 - 1986

The lack of sufficient saving instruments implies that at least part of the savings are probably held in form of foreign exchange, goods and raw material stocks.[32]

As in the West Bank, Gaza's investment also took place mainly in residential construction. The high negative correlation between construction output in Israel and in the West Bank was also found for Gaza, indicating that much of Gazan construction served as a shock absorber for changes in demand for construction workers in Israel.[33] As argued in the case of the West Bank, such "piecemeal" construction may be a further indication that -

[32] Unfortunately it is difficult to test this argument, since the only changes in stocks recorded are those of olive oil output in the WB. In Gaza no changes in stocks are recorded.

[33] This implies that the length of completing buildings in the Palestinian economy should vary more than elsewhere.

due to the lack of financial intermediation - the volume of building investment is constrained by available liquidity, which in turn is determined by current and past savings:

$$Ibuild = -1.9 + 0.30\ s + 0.03\ wealth_{t-1};\ MA(1)\ \rho = 0.66$$
$$(-.2)\quad (6.9)\qquad (9.9)\qquad\qquad (3.1)$$

Adjusted $R^2 = 0.93$, D.W. = 1.30, Period: 1969 - 1986

The equation of the demand for imports (definitions as above) differs only little from that estimated for the West Bank:

$$Im = -1.62 - 0.8\ EPM + 1.38\ C$$
$$(-2.1)\quad (-2.1)\qquad (19.2)$$

Adjusted $R^2 = 0.98$, D.W. = 0.95, Period: 1968 - 1986.

V. On the Economic Effects of the 'Intifada' - The West Bank

In the following we assess some of the economic costs of the Intifada in the economy of the Westbank.[34] The estimate consists of the difference between a hypothetical scenario and actual developments and does not take into account other economic as well as non-economic costs. The scenario simulates the outcome of the Palestinian economy, assuming that the Intifada had not taken place, and the economy continued to behave according to the estimated equations. We concentrate on the effects of the Intifada on output, growth and the standard of living. In order to calculate the potential domestic output that could have been achieved from 1988 onwards under normal circumstances, we derived the domestic employment from the production function (see equation 3).[35]

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[34]The econometric results for Gaza are less satisfactory and more work is needed in order to assess the effect of the Intifada on the Gazan economy.

[35] We included the year 1987 in the forecast, in order to get an idea of the model's performance in a "normal" year, i.e. before the Intifada.

According to our calculations (see table 2), the level of GDP fell short of its potential most strongly in the first year of the Intifada (1988) - by about 15 percent of actual GDP. Thereafter the potential output loss was considerably reduced - to 8 and 2 percent in 1989 and 1990. By the year 1991 the level of output returned to its normal level. Over the four years the cumulative output loss is estimated at about 1/4 of current GDP. The calculation also implies a cumulative loss of about 30,000 jobs in the domestic economy.

The shortfall in private consumption was much larger (in relative terms) than in output, mainly due to the negative effect of employment in Israel. In 1991 part of the loss in income and consumption should be attributed to the Gulf-war rather than the Intifada.

VI Summary

This paper provides a macroeconomic framework of the Palestinian economy in the West Bank and Gaza, with an emphasis on the supply side. The capital stock is estimated from investment data separately for the Westbank and Gaza. Through this framework it was possible to fill in gaps in the data, which occurred due to difficulties in data collection during the Intifada years, and to estimate the loss of output and the cost in terms of the standard of living in the Westbank. The framework also lays the grounds for an assessment of future developments under different political and economic conditions.

One of the major conclusions of this study is that the productive capital stock in the Palestinian economy is inadequate, mainly due to the structural problems. Future work will have to concentrate on ways and means to overcome this deficiency; using the supply side relationships in order to estimate the necessary increases in productive investments may contribute to the attempts to quantify the needs.

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Table 1: The Relative Size and Standards of Living

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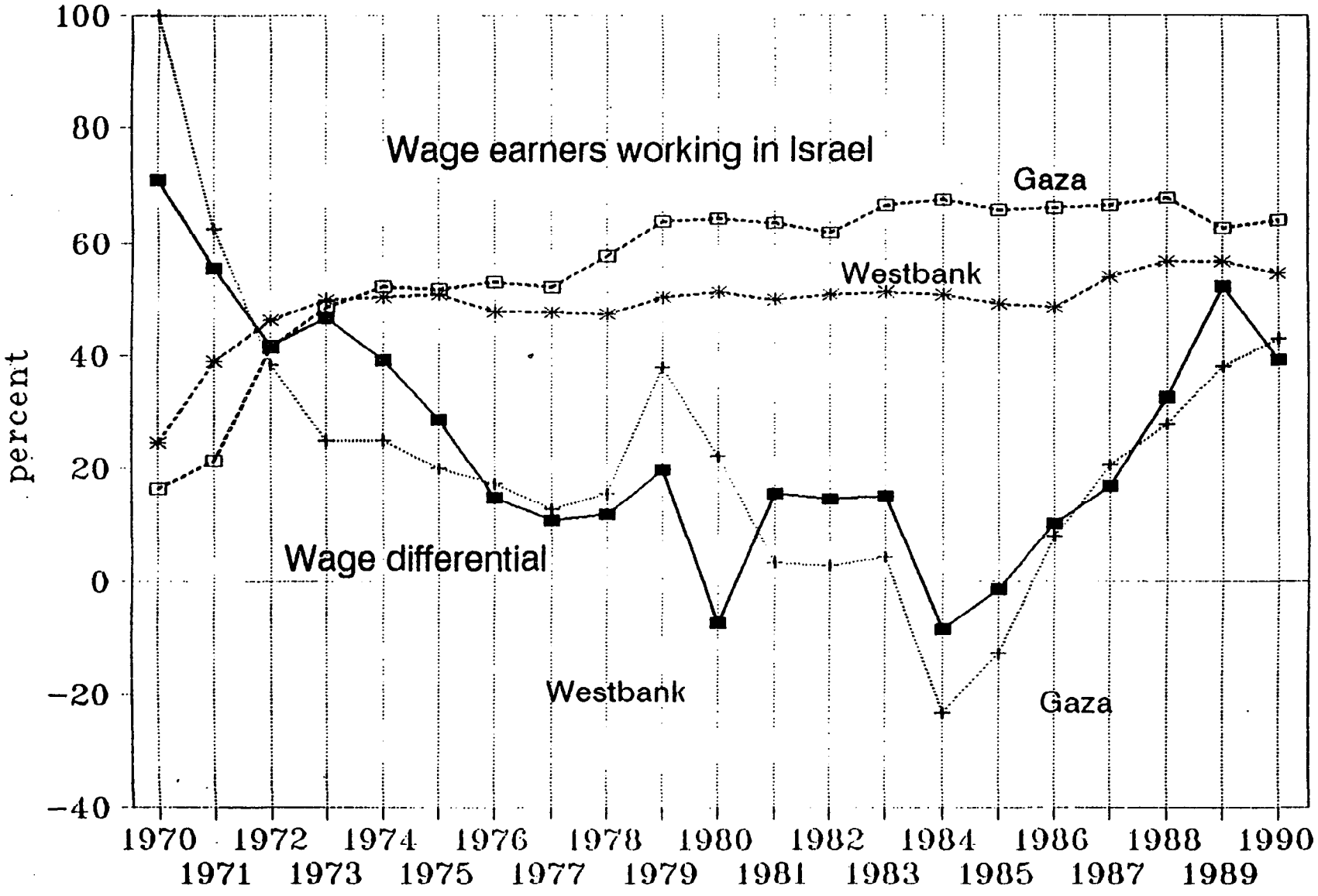
	Westbank			Gaza			Israel		
	1968/9	1986/7	1989/90	1968	1987	1990	1968	1987	1990
GDP (mio 1986-$)	330	1,197	1,311	134	408	429	12,206	31,402	34,410
Average growth p.a.		7	3		6	2		5.1	3.1
% of Area GDP	2.5	3.7	3.7	1.1	1.2	1.2	96.5	95.3	94.8
Consumption pc.(86-$)	656	1,480	NA	357	1,022	886	2,459	4,654	4,791
Average growth p.a.		5	NA		6	-5		3.4	1.0
% of Israeli Cons.p.c.	27	32	NA	15	22	18	100	100	100

Table 2: An Estimate of the Cost of the Intifada - The West Bank

	1987	1988	1989	1990	1991	1988-91
	out of sample forecast	——— Intifada- ———				cumulative effect
GDP (mio. NIS, 1986 prices)						
Actual	1726	1793	1739	2184	2031	
Estimate-no Intifada	1776	2118	1917	2245	2042	
Effect of Intifada (% of 1988 potential GDP)		-15	-8	-3	-1	-27
Disposable income (mio. NIS, 1986 prices)						
Actual	2293	2099	1986	2179	1912	
Estimate-no Intifada	2158	2481	2287	2577	2296	
Effect of Intifada (% of 1988 potential DI)		-15	-12	-16	-15	-59
Private Consumption (NIS, 1986 prices)						
Actual	1895	NA	NA	NA	NA	
Est. with actual disp.income	1917	1757	1752	1843	1735	
Estimate-no Intifada	1829	2007	1950	2107	1992	
Effect of Intifada (% of 1988 potential C)		-12	-10	-13	-13	-48
Employment at home (thousands)						
Actual	115	119	115	128	124	
Estimate-no Intifada	115	132	118	137	125	
Effect of Intifada in number of jobs (thousands)		-12.8	-2.5	-9.5	-1.3	-26.1

Fig. 1: Movement between Labor Markets and Wage Differentials (all sectors)



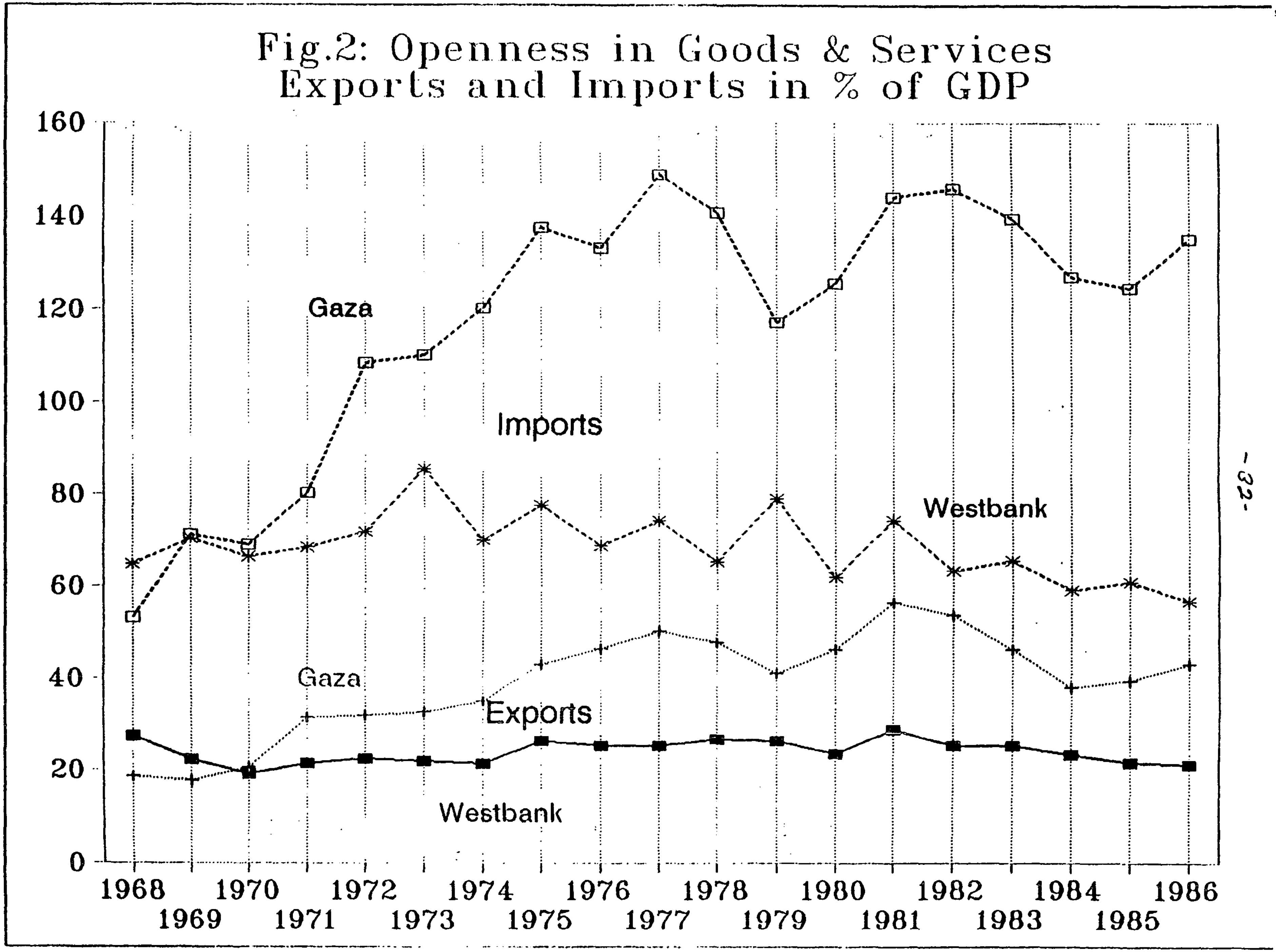
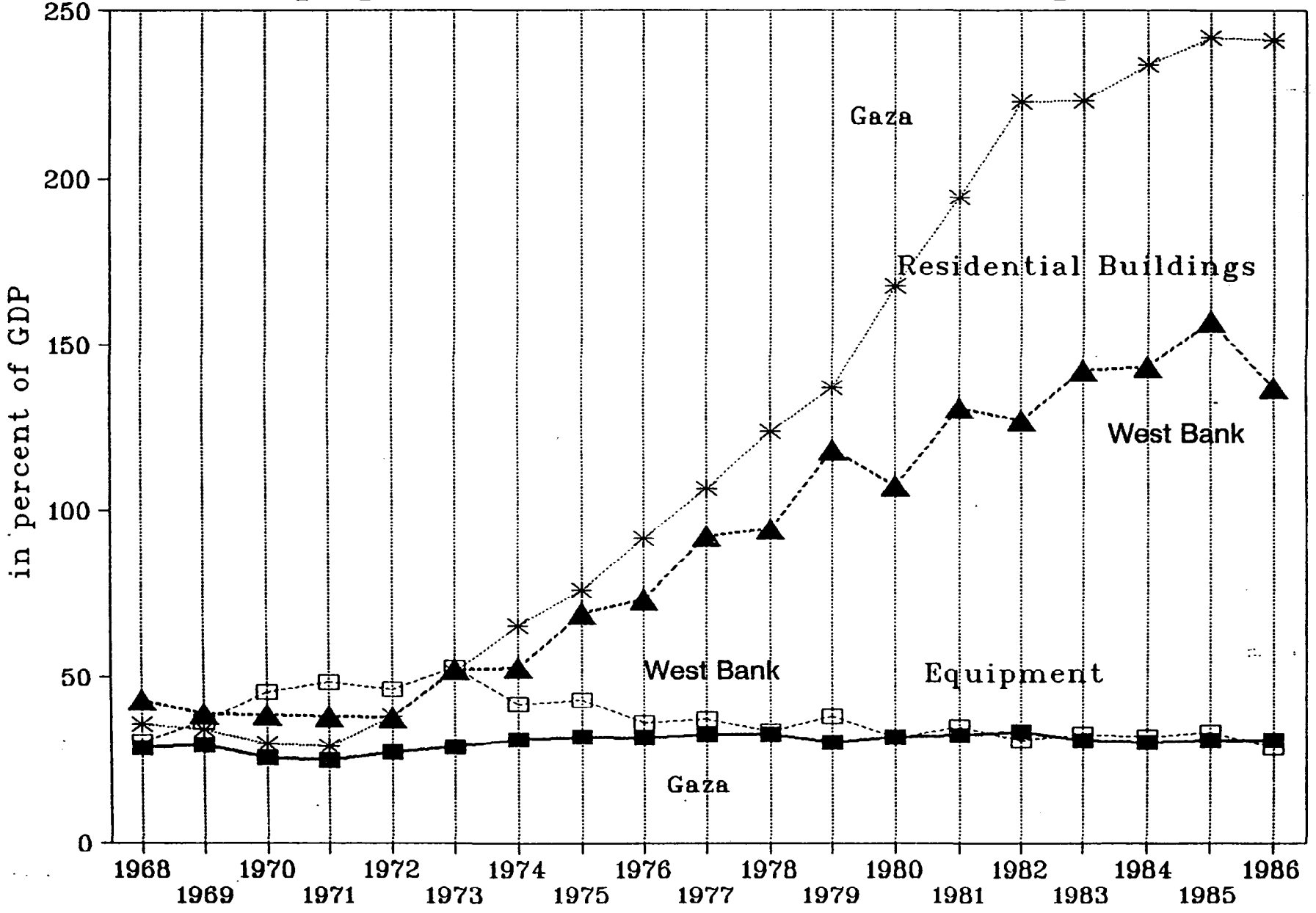


Fig.2: Openness in Goods & Services
Exports and Imports in % of GDP
160
140
120
100
80
60
40
20
0
Gaza
Imports
Westbank
Gaza
Exports
Westbank
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986

Fig.3: Capital Stock
Equipment and Residential Buildings



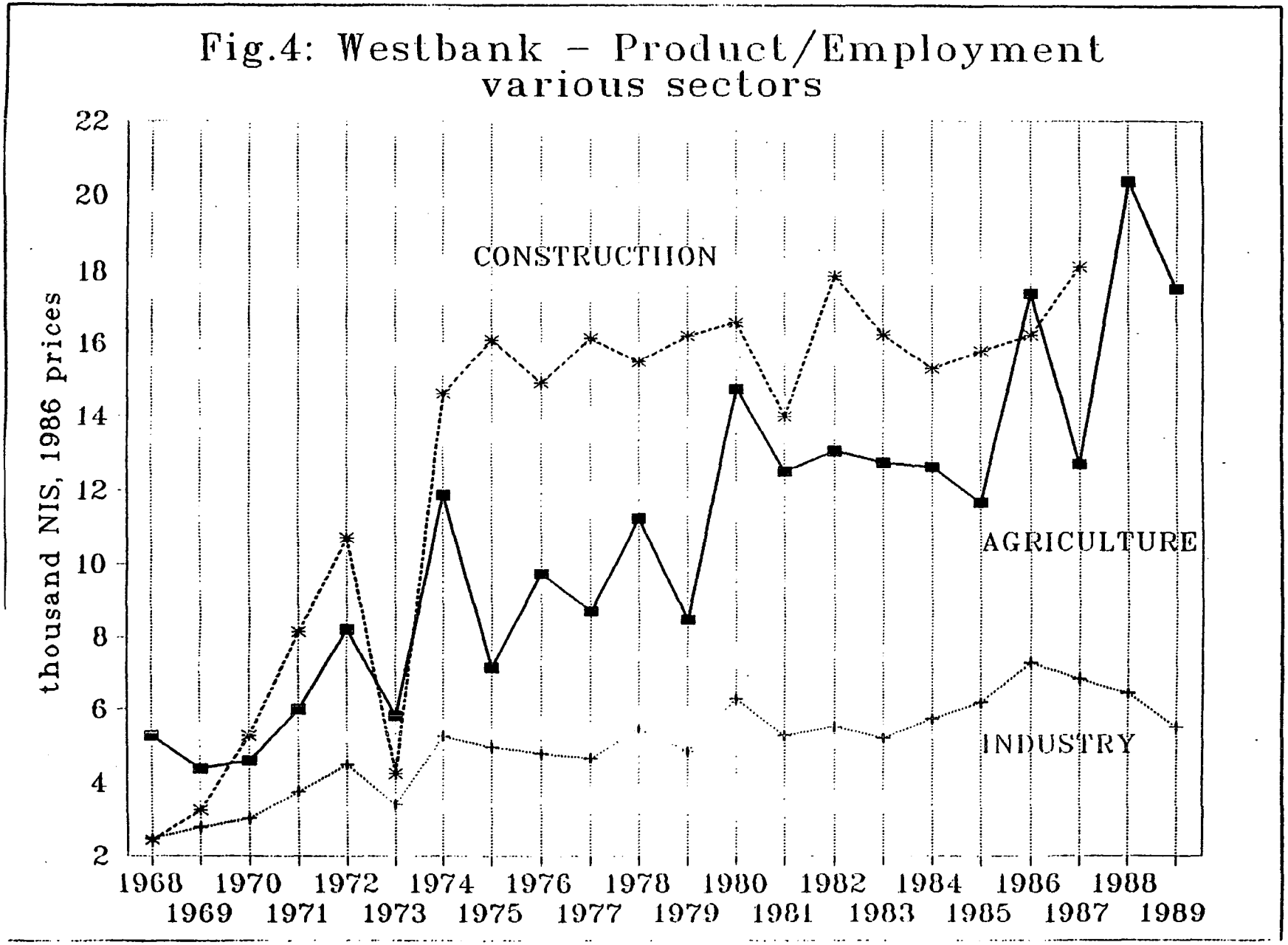


Fig.4: Westbank – Product/Employment
various sectors
thousand NIS, 1986 prices
22
20
18
16
14
12
10
8
6
4
2
CONSTRUCTION
AGRICULTURE
INDUSTRY
1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989

Fig.5: Unemployment/Labor-force
Nonemployed/Working age population

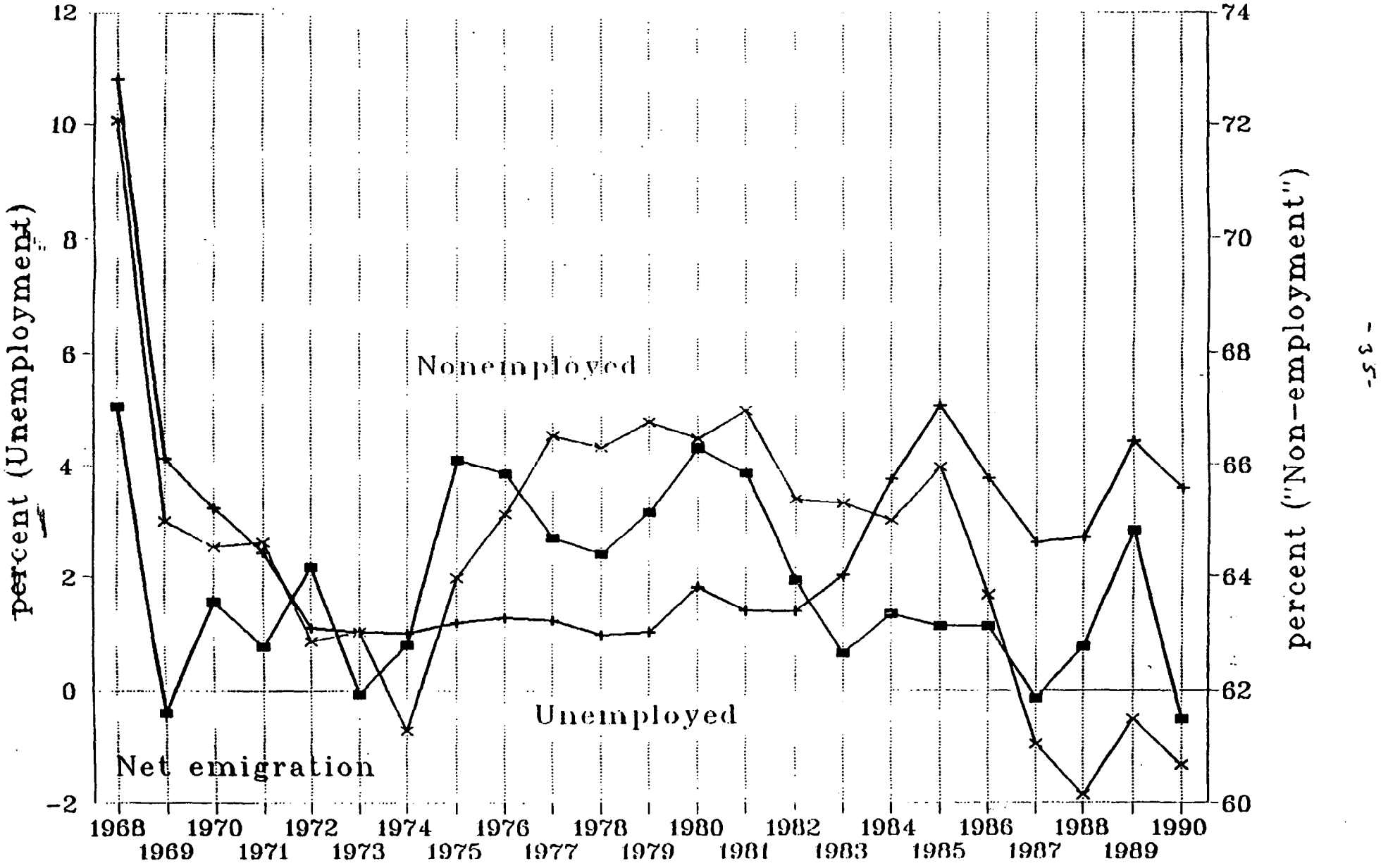
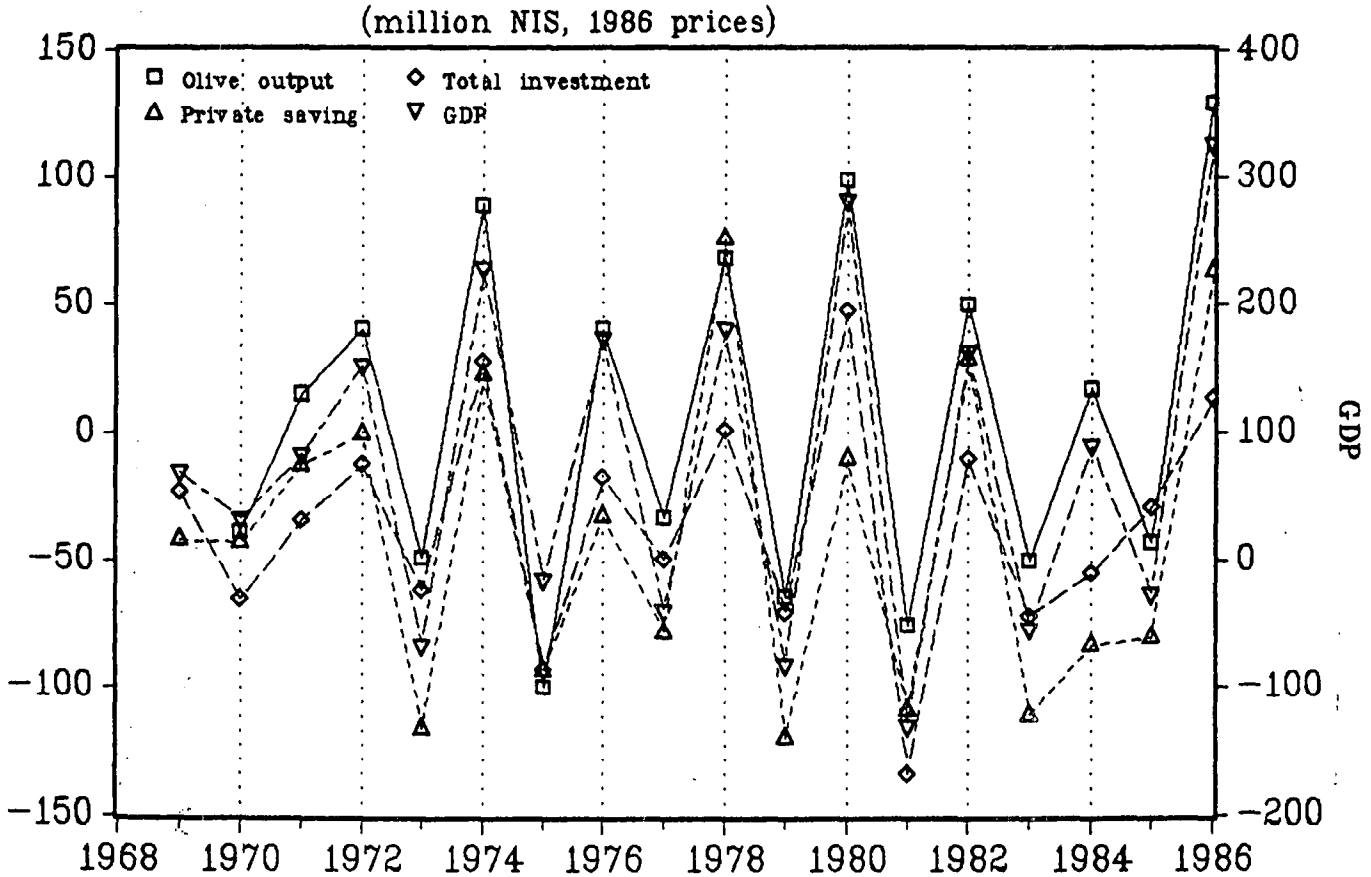


Fig.6: Olive Output and Key-Variables in the West Bank: Changes in Flows

(million NIS, 1986 prices)



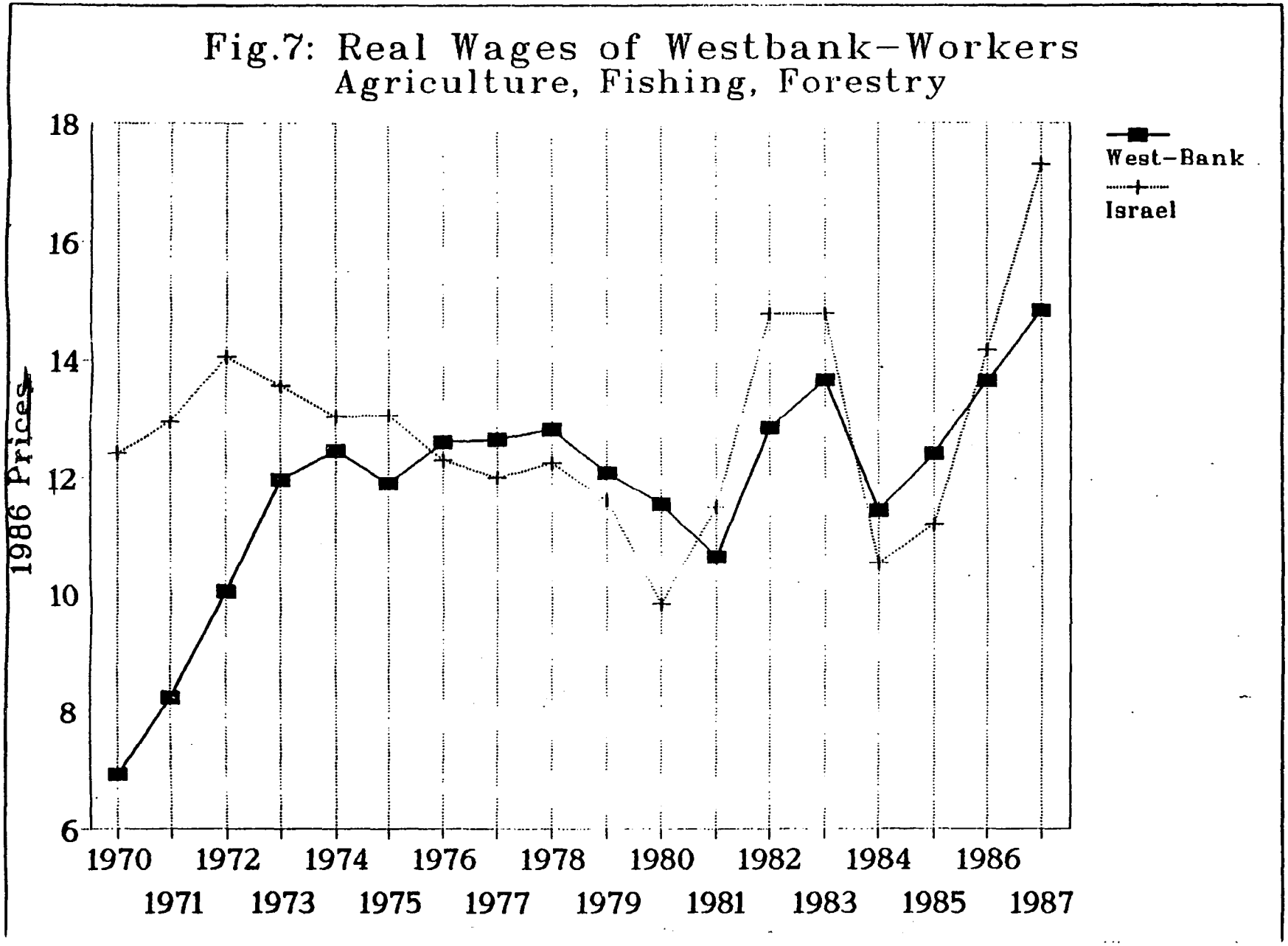
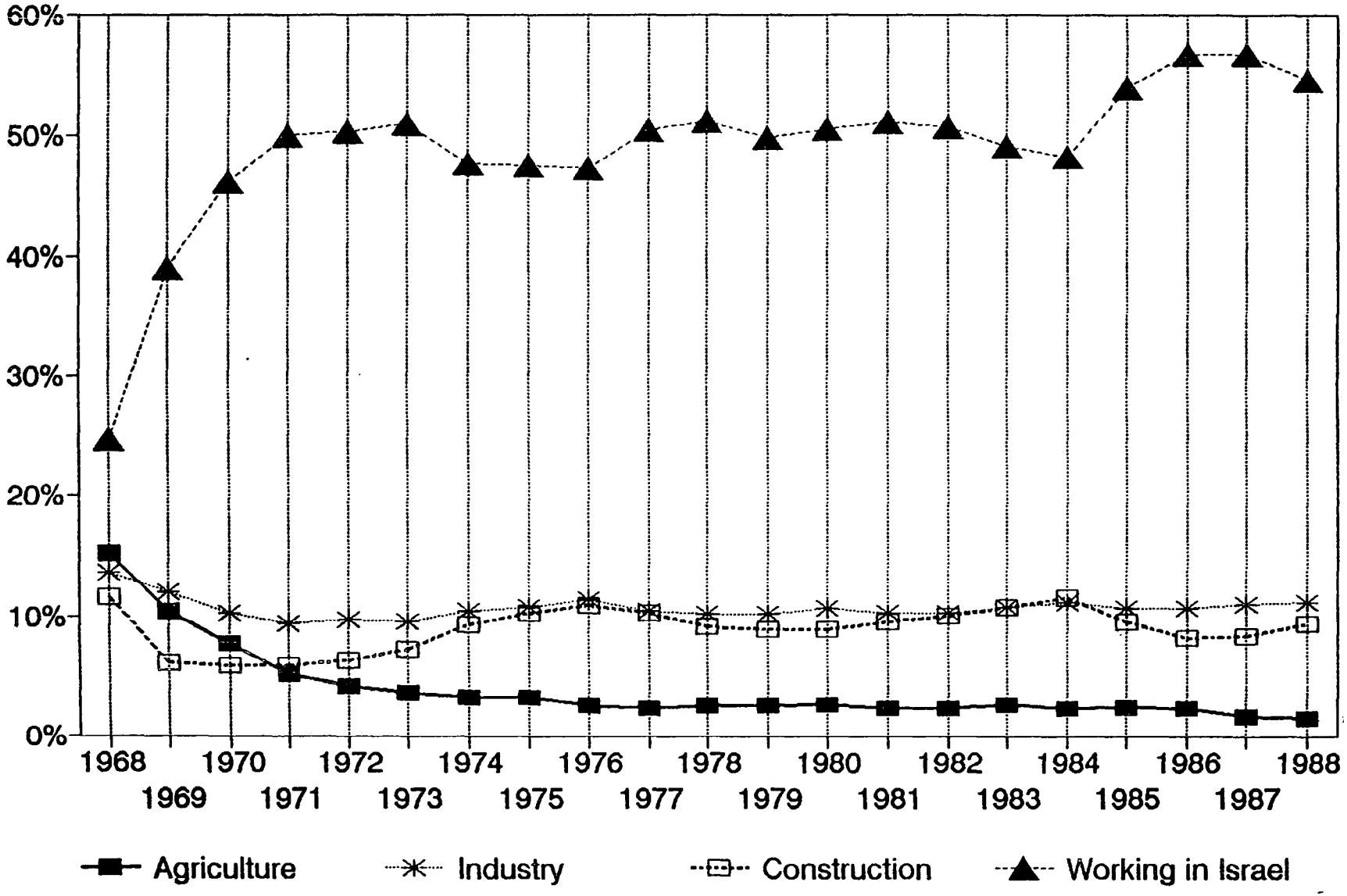


Fig.7: Real Wages of Westbank-Workers
Agriculture, Fishing, Forestry
1986 Prices
18
16
14
12
10
8
6
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
West-Bank
Israel

Fig.8: Wage-Earners by Sector
in % of Total Wage Earners



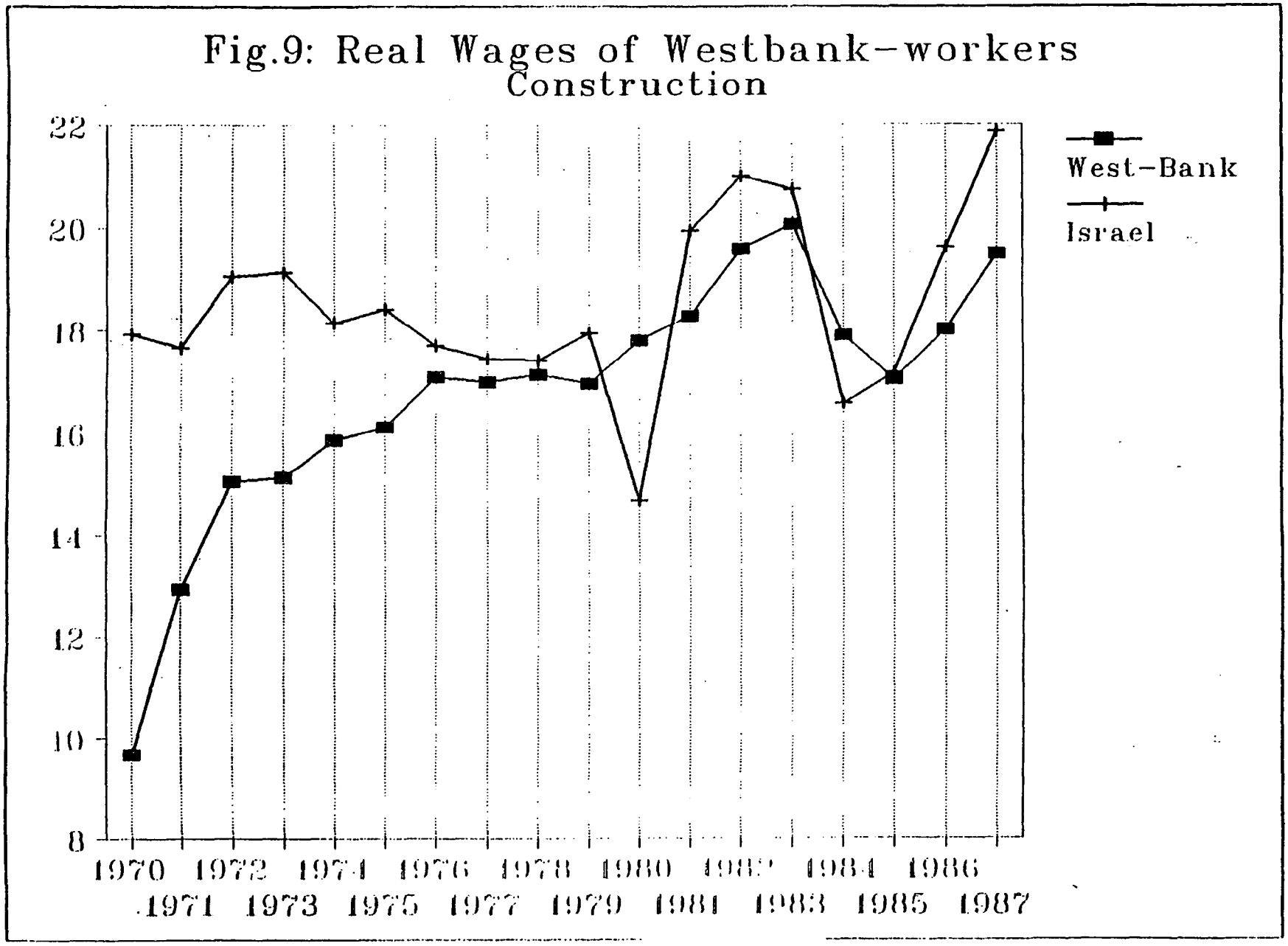


Fig.9: Real Wages of Westbank-workers
Construction
22
20
18
16
14
12
10
8
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
West-Bank
Israel

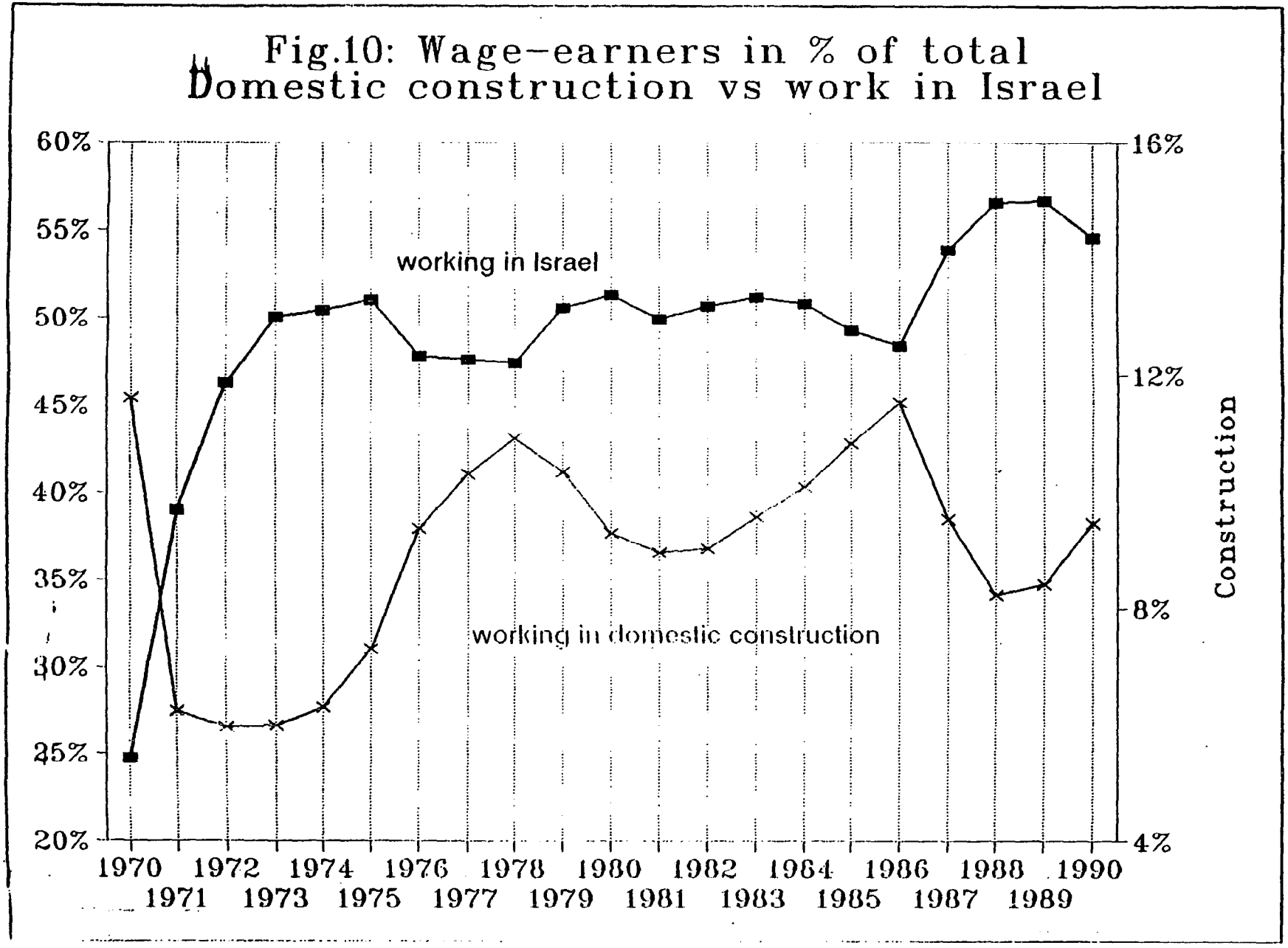


Fig.10: Wage-earners in % of total
Domestic construction vs work in Israel
60%
55%
50%
45%
40%
35%
30%
25%
20%
16%
12%
8%
4%
working in Israel
working in domestic construction
Construction
1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990

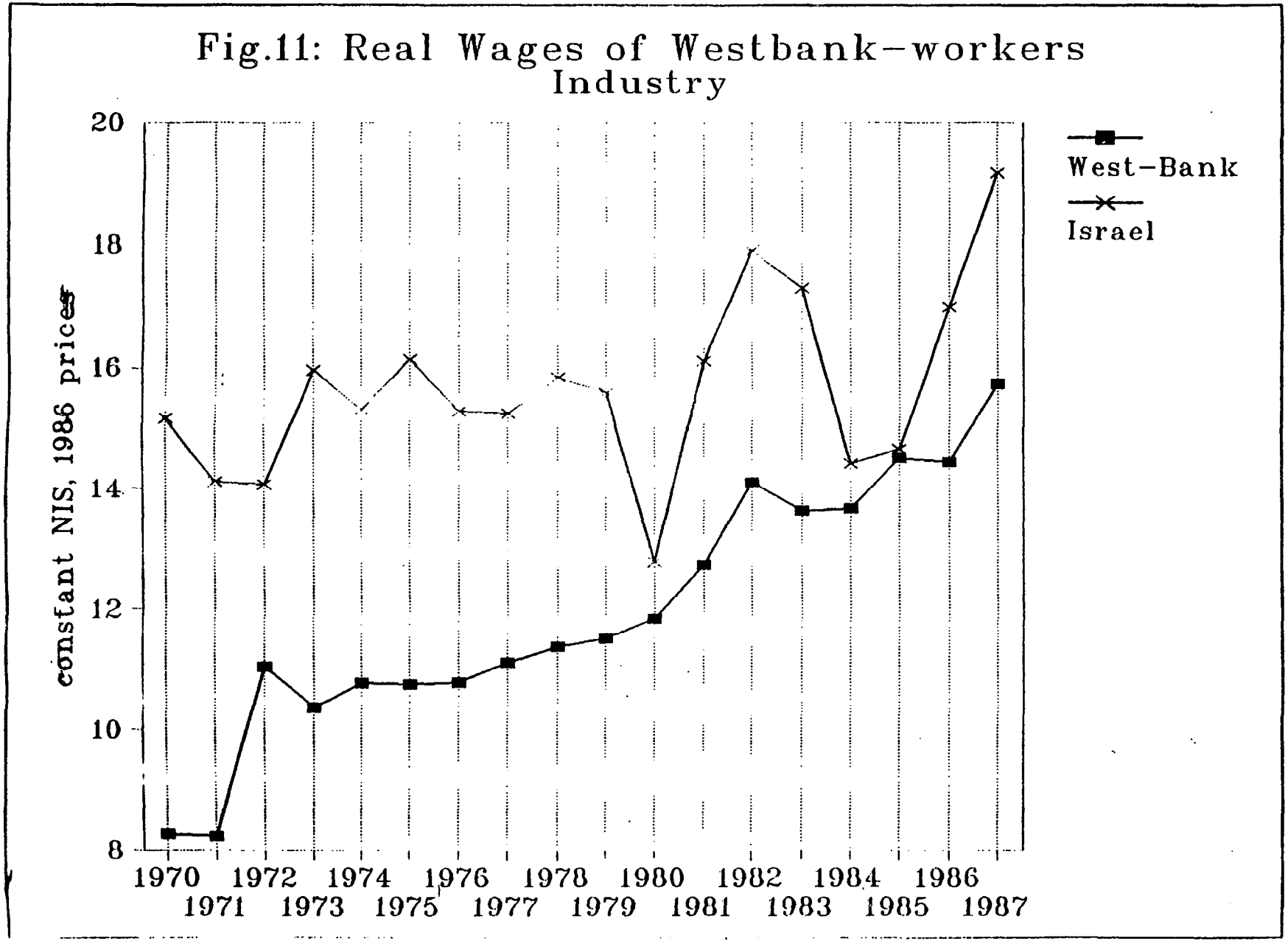


Fig.11: Real Wages of Westbank-workers
Industry
20
18
16
14
12
10
8
constant NIS, 1986 prices
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
West-Bank
Israel

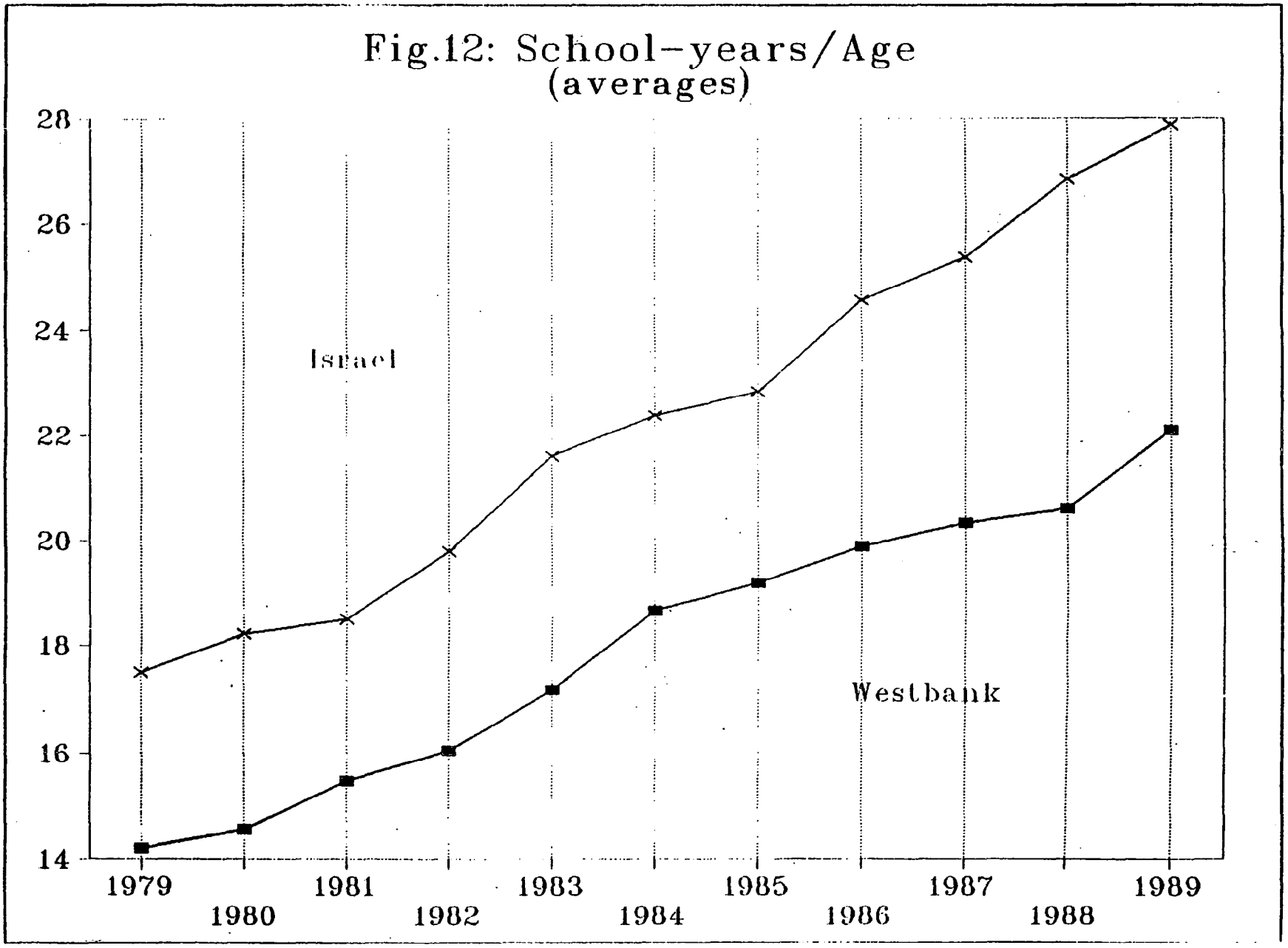
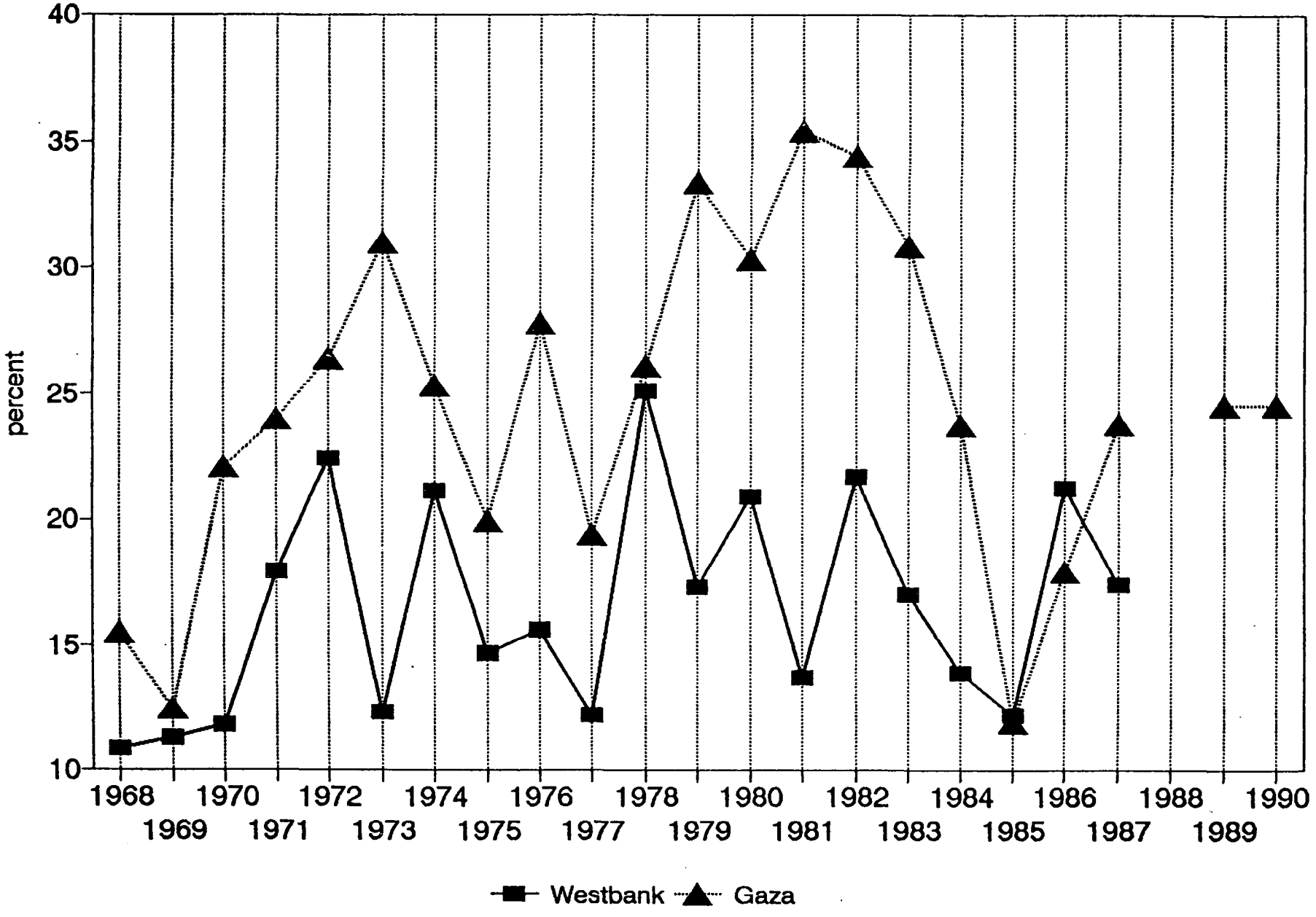


Fig.12: School-years/Age
(averages)
28
26
24
22
20
18
16
14
Israel
Westbank
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989

Fig.13: Saving Rates

(in percent of disposable income)



Appendix Table 1: Basic Data on the Economy of the Westbank and Gaza
(millions of NIS, 1986 prices)

Year	GDP		Employment at home thousands		Employment in Israel thousands		Domestic wages all sectors		Wages in Israel all sectors		Business capital stock	
	WB	Gaza	WB	Gaza	WB	Gaza	WB	Gaza	WB	Gaza	WB	Gaza
1968	459	201	84.0	46.0	3.7	1.3	NA	NA	NA	NA	156	66
1969	529	215	100.0	51.8	10.0	1.1	NA	NA	NA	NA	167	68
1970	561	260	99.9	52.9	14.9	5.9	8.5	8.3	14.7	16.7	225	74
1971	644	291	91.4	51.5	25.7	8.4	9.1	9.5	14.3	15.5	291	79
1972	796	304	90.5	46.0	35.0	17.8	10.4	13.1	15.4	18.2	357	86
1973	730	323	88.0	45.6	38.9	22.8	10.8	15.8	15.7	19.8	430	104
1974	957	337	95.2	46.7	43.1	26.6	11.7	12.9	16.4	16.1	471	125
1975	943	362	92.3	46.7	40.8	26.2	12.2	13.1	15.4	15.7	520	147
1976	1116	392	93.1	48.3	37.4	28.2	12.7	13.5	14.5	15.8	568	167
1977	1077	412	92.4	49.5	35.8	28.1	12.7	13.1	14.1	14.8	611	194
1978	1257	429	94.6	48.7	38.0	32.2	12.8	13.9	14.5	16.1	661	222
1979	1175	476	93.2	45.5	40.8	34.7	12.4	13.4	14.7	18.5	732	248
1980	1457	451	95.0	46.3	39.8	35.2	12.9	11.6	14.5	14.1	813	275
1981	1316	452	94.3	46.6	40.5	36.6	13.7	15.4	16.0	15.9	873	296
1982	1495	440	98.4	46.1	44.1	36.6	15.1	17.4	17.3	17.9	911	321
1983	1445	483	98.1	45.6	49.1	40.5	15.4	16.8	17.2	17.6	955	339
1984	1527	498	102.9	47.0	51.2	40.2	15.2	18.5	14.6	14.2	1000	356
1985	1500	511	103.7	48.9	47.5	42.0	14.4	15.7	14.5	13.7	1034	369
1986	1856	544	115.7	50.8	50.0	43.4	16.2	17.1	17.3	18.4	1079	384
1987	1726	611	114.7	54.1	62.9	46.1	NA	19.6	20.2	23.6	1151	402

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Year	Private consumptio		Disposable private income		Total gross domestic investment		Business sector invest.		Gov'nmen cons.		Exports		Imports	
	WB	Gaza	WB	Gaza	WB	Gaza	WB	Gaz	WB	Gaz	WB	Gaza	WB	Gaza
1968	522	203	575	243	34	25	25	8	77	42	126	37	297	106
1969	624	241	691	278	89	49	71	12	84	51	116	38	371	152
1970	698	283	778	368	59	47	85	11	96	61	107	53	372	178
1971	774	304	927	403	91	58	89	14	104	61	138	91	440	233
1972	926	376	1174	514	166	101	102	26	111	64	177	97	569	329
1973	959	396	1075	579	143	115	75	30	112	66	160	105	623	354
1974	1042	434	1299	586	297	122	87	31	116	66	203	117	669	404
1975	1118	486	1289	611	212	139	91	32	114	64	247	156	730	498
1976	1228	486	1431	678	278	160	89	40	117	66	282	182	766	521
1977	1234	563	1382	702	278	161	101	43	119	65	270	207	798	614
1978	1267	562	1662	766	381	176	127	43	120	68	333	204	819	604
1979	1358	563	1614	850	340	197	143	47	126	67	310	195	924	556
1980	1371	556	1705	795	535	174	130	43	126	63	342	207	900	566
1981	1433	564	1642	873	351	192	115	49	129	63	377	254	954	651
1982	1485	581	1874	876	450	177	124	44	129	63	374	235	931	640
1983	1488	655	1776	946	405	180	126	44	138	63	361	223	926	653
1984	1521	685	1767	898	394	172	115	44	142	66	353	188	890	617
1985	1501	702	1711	797	440	164	127	46	145	63	322	200	909	622
1986	1767	776	2243	944	578	184	158	51	165	68	388	232	1042	716
1987	1895	833	2293	1093	497	201	155	65	178	74	349	245	1193	743

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