

INT-1627

CEPAL(1627)

Borrador para discusión
Sólo para participantes

22 de Enero de 1996

CEPAL
Comisión Económica para América Latina y el Caribe

VIII Seminario Regional de Política Fiscal
Organizado por CEPAL/PNUD con el copatrocinio de FMI, BID y Banco Mundial

Santiago, Chile, 22-25 de Enero de 1996



***"FISCAL BALANCE DURING INFLATION, DISINFLATION,
AND IMMIGRATION: POLICY LESSONS"*/***

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September 1995

FISCAL BALANCE DURING INFLATION, DISINFLATION, AND IMMIGRATION: POLICY
LESSONS^{1/}

by

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This paper provides an overview of the role of the fiscal deficit and the ensuing public debt in explaining major episodes in Israel's contemporary economic history. We focus on the inflation and disinflation episodes in the 1980s, and the more recent experience of massive immigration in the 1990s. These episodes can serve as a testing ground for old and new theories concerning the role of fiscal policies in economies which are subject to various external and domestic shocks. Main questions addressed in the paper are: What is the relation between deficits and inflation? How does inflation and disinflation affect effective tax burdens and the distribution of income between capital and labor? Is there evidence for debt neutrality and for tax smoothing? Can a fiscal contraction be expansionary? What factors caused the immediate boom and the subsequent real appreciation and recession observed in Israel after the 1985 stabilization program? How are government finances affected by massive immigration and why is the recent Israeli experience so different from the German one in this respect?

^{1/} We thank Nils Gottfries for useful comments.

The paper is organized as follows. Section 1 overviews the theoretical underpinning of the macroeconomic effects of fiscal policies. Section 2 highlights the main features of the inflation process in Israel. Section 3 analyzes the links between fiscal contractions and aggregate demand. The income distribution issues associated with inflation and disinflation are considered in section 4. Post disinflation cycles are considered in section 5. The role of tax smoothing and the labor market in the success of the absorption of immigrants are analyzed in section 6. Section 7 contains a summary and concluding remarks.

1. Macroeconomic Effects of Debt: Theory

There are a number of ways to model the macroeconomic impacts of the government deficit and its accumulation into government debt. We argue that the Israeli experience can best be cast within two main frameworks, which we will now sketch briefly.

The first is the traditional Mundell-Fleming model, which emphasizes short-term, cyclical effects of macroeconomic policies (fiscal and monetary) on inflation, real exchange rate, employment, external imbalances, and the like.^{1/} The second framework emphasizes long-term intertemporal considerations pertinent to economies with forward-looking individuals, as in Barro (1974). Within this framework issues such as tax smoothing, debt neutrality, the effect of government deficit on private savings and interest rates, public consumption versus public investments, policy credibility, fiscal contraction and consumption boom, and the like, can be usefully analyzed.

^{1/} The real exchange rate measures the relative price of foreign produced goods in terms of home produced goods.

The small economy version of the Mundell-Fleming model is suitable for assessing the impact of government deficits and the associated monetization on the short-run adjustment to equilibrium. The model consists of four key elements. The first is the demand-supply equation for the domestic product. (Its mirror image states that the current account deficit is equal to investment minus savings, both private and public.) The second is a standard market-clearing equation for domestic money. The third states that international mobility of financial capital must yield interest parity: the nominal rate of interest is equal to the world (nominal) rate of interest plus the expected rate of depreciation of the domestic currency. The fourth key element is a slow short-run adjustment of wages and prices, due to pre-set nominal contracts. The model predicts that a government deficit would lead to a higher real rate of interest, an appreciation of the real exchange rate, an increase in the current account deficit, higher aggregate demand and employment, and higher domestic prices. When, as is typically the case, the government deficit is at least in part monetized (in the current as well as the expected future periods), prices, employment and the external deficit grow even higher, while there is an offsetting effect on real interest rates and the real exchange rate. The real effects of

monetary policy, however, dissipate in the longer run when wage and price contracts adjust fully.^{1/}

Now, when more long-run driving forces of individual optimization behavior a la Barro are taken into account, some of the conclusions of the above more traditional framework are modified. Economic agents with a long horizon may well realize that higher government deficits in the present will eventually necessitate surpluses in the future, so as to keep the government solvency intact. As a result, private savings may offset government dissavings, thereby mitigating the Mundell-Fleming effects of government deficits on the real rate of interest and the real exchange rate. Nevertheless, with slow-adjusting prices, the associated monetary expansion may still be effective, as in the Mundell-Fleming framework.

Since taxes cause deadweight losses, with an increasing marginal burden, it may not be optimal for the government to increase taxes each time that its spending will rise. Consequently, it may be optimal to smooth taxes

^{1/} Under a flexible exchange rate, a current transitory fiscal expansion (which does not alter expectations about the future path of the exchange rate) induces a rightward shift of the IS schedule, raising the level of output and raising domestic interest rate. To maintain interest parity, the rise in the interest rate must result in the appreciation of the domestic currency. Under a fixed exchange rate, interest arbitrage ensures equality between the domestic and foreign interest rates. Consequently, a fiscal expansion that induces a rightward shift of the IS schedule gains full potency in raising the level of output, because there is no currency appreciation to offset it. Monetary policy is only weakly effective under exchange rate targeting since a tight monetary policy which put an upward pressure on the domestic interest rate induces capital inflow from abroad, which has to be monetized given the commitment to the exchange rate target. The monetization of the capital inflow neutralizes the initial monetary tightness.

over time, by allowing deficits in high-spending and/or low-output years, and surpluses in low-spending and/or high-output years. This tax pattern will then equate the marginal excess burden over time, thereby minimizing the sum total of excess burdens over time. Thus, a balanced-budget rule, which is in direct conflict with tax smoothing, is bound to involve significant deadweight losses.

Interestingly, if the deadweight loss is expected to rise with the fiscal pressure, then a drastic fiscal consolidation may untraditionally generate a rise in aggregate private demand. The reason for the increase in aggregate private demand in this case is twofold. First, when the growth of public debt comes to a halt through the fiscal contraction program, consumers realize that future debt service is considerably less distortionary. The fiscal contraction which accordingly helps restore balance in the intertemporal allocation of the tax burden will increase consumers' lifetime wealth. Consequently, private consumption will then expand as well, contrary to the prediction of the traditional model. Second, private investment may rise as a result of the expected future decline in capital income (especially corporate income) taxes. Thus, a fiscal-based disinflation program is plausibly expansionary under these circumstances, raising aggregate demand and employment (see Giavazzi and Pagano (1990)).

All in all, in practice persistent government deficits typically generate inflationary processes. The latter have significant real effects on the distribution of income, the tax system, and growth.

2. The inflation process: fiscal and monetary fundamentals

Israel's flirtation with inflationary cycles can ironically serve as a good test ground for macro-economic theories. Following the Yom Kippur War of October 1973 and the pursuant oil crisis (OPEC I), Israel's fiscal and monetary disciplines were significantly weakened. A key factor in this process was a sharp increase in military expenditures with associated slowdown in economic growth and, consequently, a low growth of the tax base. Government deficits persisted, resulting in a growing public debt. Figure 1 describes the public sector deficit as a percentage of GDP. It shows a sharp increase in the deficit to a level of 12-20 percent of GDP following that war. These deficits accumulated to generate a peak public sector debt of 175% of GDP at the end of 1984, just before a sharp disinflation policy was implemented. (See Figure 8a for the development of the public sector net debt.) Eventually, the public deficit was in part monetized. Also, the weak fiscal discipline must have pushed wages upward well above productivity increases (see Figure 2), a trend which was accompanied by an accommodating monetary policy. Furthermore, controls on capital imports were largely relaxed in October 1977. This occurred when domestic rates of interest were significantly higher than their world counterpart and the exchange rate, though officially flexible, in practice still severely managed at a rate of

depreciation which fell short of the interest rate differential. The deviation from the (uncovered) interest parity favored domestic financial investments. This generated a massive capital inflow which was largely monetized by the managed exchange rate mechanism. The growing public debt gave rise to expectations of future monetization of budget deficits, thereby raising current inflationary pressures (see Sargent and Wallace (1981)). In sum, under the apparently managed exchange rate system the central bank could not control the money supply: higher interest rates only generated capital inflow and the sterilization of the capital flows was to a large extent ineffective. At the same time, with growing budget deficits any anti inflation monetary policy would have been severely contractionary, which made this kind of policy politically infeasible. In a nutshell, these factors are the fundamentals behind the eruption of high inflation in Israel in the late 1970s, lasting until mid-1985 (see Figure 3).

In mid-1985, with the external debt reaching a record high of 80% of GNP, the government finally decided to get its act together and embarked on a comprehensive stabilization policy which proved remarkably successful. Before that, several attempts were made at slowing the rate of inflation. These were based on holding back devaluations and/or using administrative measures aimed at restraining price increases or actually freezing prices, even though it was evident that the economic fundamentals were not in line with "anti-inflation" measures. Most importantly, none of these attempts

included a significant budget consolidation. ^{1/}

The distinct feature of the mid-1985 disinflation program was a major and severe fiscal and monetary restraint, coupled with a major realignment of key prices. Government subsidies of basic food products and public transportation were severely slashed. In addition, there was a cut in domestic defense spending (following the pullout of the Israeli army from Lebanon). ^{2/} In addition to the significant expenditure cuts, tax revenues increased substantially. A significant part of the increase in tax receipts was a direct consequence of the lower inflation rate. Indeed, when inflation rates are high, the time lapse between the accrual of the tax liability and the actual payment of that liability erodes the total amount of tax revenue collected in real terms (the so-called Tanzi effect). Thus, when inflation rates drop, real tax collections automatically rise. Another cause for the growth in tax revenues was the adoption of a Blue-Ribbon Commission's recommendations on the taxation of the business sector under

^{1/} Ruge-Murcia (1995) addressed the issue of credibility of disinflation programs from an econometric perspective. In his application to Israel, he provided evidence as to the lack of credibility of the failed stabilization programs of 1984 and early 1985. The skepticism about the content of spending cuts in the disinflation package explains, in part, the volatility of inflation in this period. In contrast, his estimates show that for the July 1985 program, individual agents correctly inferred that a major shift in regime drives the spending process. Thus, his estimates confirm that the fiscal regime shift was indeed credible and effective.

^{2/} Wage and price controls have been used in the first few months, immediately after the stabilization program. However, price controls were partial and relatively ineffective. Wages were renegotiated, on a national level, to sacrifice the first cost of living adjustment but to pick up most of the price increases later on. Real wages which suffered a short-term reduction in the immediate aftermath of the program, increased significantly in the following two years.

conditions of inflation that tightened the indexation procedures for calculating real income in the business sector for tax purposes. Also, a temporary surtax on the income of self-employed was levied.

Figure 4 shows the effects of the ensuing fiscal restraint. The public sector domestic deficit fell to 0%-2% of GNP, from about 12% prior to the stabilization. Together with a total of \$1.5 billion of emergency aid (over a two-year period) provided by the United States Government, this helped to generate an overall budget surplus amounting to some 2% of GNP. Despite the pegged exchange rate policy, tight restrictions on international capital movements enabled the monetary authorities to exercise a severe restraint. (For instance, a surcharge was levied on financial capital imports.) The effects of the monetary restraint are shown in Figure 5. A curbing of the M3 monetary aggregate (which includes means of payments, interest-bearing unindexed assets, and resident deposits linked to foreign currencies) became immediately apparent after the implementation of the stabilization program. The sharp decline in the rate of growth of the money supply came at a time when the demand for money grew drastically due to the lower inflation expectations. As a result, the monetary restraint also expressed itself through a sharp rise in real interest rates, immediately after the program was implemented (see Figure 6). These measures naturally contributed to a drastic fall in inflationary pressures, and consequently, to an almost immediate economic stabilization.

The realignment of some key prices included, in addition to the cut in

subsidies, a remedial adjustment in the exchange rate. The Israeli sheqel was devalued by 42% upfront. In fact, the exchange rate at that point reached a real level that was never experienced again until now, 10 years later. Indeed, the deficit cut facilitated the sharp real depreciation in the immediate aftermath of the program. The direct effects of the devaluation and the cut in subsidies on the CPI were initially sterilized from the cost-of-living adjustment (COLA) to wages. Real wages later recouped this decline within one year (see also Figure 2).

Following the stabilization program, the government used the exchange rate as a nominal anchor. Together with a fairly tight monetary policy which was reflected in high interest rates (see Figures 5 and 6), the exchange rate peg generated, in line with the Mundell-Fleming hypothesis, a continuous process of real appreciation of the Israeli sheqel. Thus, in the post-stabilization phase, tight monetary policy and high interest rates supported the pegged exchange rate in the presence of capital inflows and generated a loss of competitiveness (real appreciation). With a lag of about two years, the policy mix of fiscal and monetary restraint and real appreciation of the Israeli sheqel led the economy into a recession and rising unemployment, very much like the experience of Sweden, Italy and the U.K. prior to the ERM currency crisis of 1992.

3. fiscal contraction and private and aggregate demand

In this section we will analyze the relationship between public and private savings and the effect of fiscal contraction on aggregate demand.

3.1. private and public saving rates

The possibility of public debt neutrality has gained renewed interest since Barro's (1974) seminal contribution, "Are Government Bonds Net Wealth?" Specifically, assume a given path of government expenditures. Now, suppose the government cuts taxes and issues new bonds in order to finance the resulting deficit. Naturally, the current disposable income of the private sector rises. The question is whether the entire current increase in disposable income will be saved by the private sector in anticipation of the higher taxes (and the consequent lower disposable income) in the future, needed to finance the larger government debt service. If the answer is in the affirmative, that is, additional private savings completely offset the additional government dissavings, then national saving must remain intact, a phenomenon dubbed "debt neutrality." In this case, government's bonds in a non-monetary economy as in Barro (1975) are not net wealth in the hands of the private sector, since the latter capitalizes immediately the future tax liability generated by increased government's debt. Indeed, if capital markets are well functioning (so that there are no liquidity constraints), taxes are nondistortionary, prices are market clearing, and the private sector does not suffer from myopia, debt neutrality is expected

to prevail: a debt-financed tax-cut has no effect on national saving ^{1/}. In contrast to the more traditional Keynesian notion that such a fiscal measure stimulates private sector consumption and pushes interest rates upward.

As was already mentioned, Israel's disinflation program of 1985 involved a sharp reduction in the public deficit. Thus, it can provide a testing ground for the validity of the debt-neutrality hypothesis. Indeed, Figure 7 reveals that when government's savings rose after the stabilization, private savings fell so that national savings increased only moderately. Furthermore, this figure shows that the national saving rate out of a broad measure of income (which includes, in addition to GNP, unilateral transfers from abroad) is fairly trendless; the private saving rate is almost a mirror image of the public saving rate. It can be seen, however, that there was some increase in national saving in 1985-6, after the sharp fiscal contraction which was the backbone of the disinflation program. In other words, the associated decline in private saving was smaller than the increase in public sector saving.

An econometric study by Leiderman and Razin (1988) of the neutrality of public debt, centers around the stabilization episode. They implement a model with two deviations from debt neutrality (consumers with finite

^{1/} Strict debt neutrality holds under the assumption that each family has an operational bequest motive, based on equating the marginal utilities of all generations. Rising real wages in the future may, however, make the bequest motive nonoperational for some families, since parents are likely to want to receive transfers from their children but this transfer may not be enforceable.

horizon and liquidity constraints, but not tax distortions) on monthly data from Israel during the first half of the 1980s. They found some econometric support for the debt-neutrality hypothesis, but only after proper adjustment is made for liquidity constraints. Furthermore, the proportion of liquidity constrained individuals in the population was found to be small (but significant).

What can explain the less-than-full offsetting changes in private saving to sharp rise in public saving? We think that the sharp increase in productivity that followed the disinflation program, despite of the resulting consumption boom (see below), was the major reason why private saving did not fall to an extent that would fully offset the increase in public saving.

3.2. can fiscal contraction be expansionary?

In the presence of significant deadweight losses of taxation, sharp fiscal policy changes are likely to be expansionary (see Giavazzi and Pagano (1990)). Such policy changes generate expectations for a future decline in the excess burden of taxes and, thereby, raise current private consumption. This was indeed the case of the fiscal consolidation in Israel, which was accompanied by a significant increase in aggregate private demand. By bringing the fiscal situation under control, the stabilization produced a wealth effect that generated a boom, even though taxes increased in the short run, especially, since the success of the stabilization came as a surprise that went against expectations that were ingrained in past divergence between the expenditure path and the tax revenue path.

The conclusion is that the sharp cut in the deficit, as a key part of the stabilization program, had apparently a direct effect on inflation, both current and expected, even though by itself it had only a relatively small effect on national savings. A partly monetized current deficit and accelerated public debt with an already high tax burden (on a base which was shrinking as a result of inflation) must have generated expectations for future monetization of the debt service (a la Sargent and Wallace (1981)) which fed into the current inflation process. The consolidation of the public budget halted this process.

The elimination of the public deficit which was partly achieved through spending cuts was indeed a key ingredient in the policy to halt inflation. Even though it led to growth in private consumption (so that national saving has not changed much). ^{1/} An increase in unilateral transfers from abroad, induced mostly by a special grant from the United States, and a sharp fall in domestic investment (driven down by an increased tax burden on capital; see the next section) helped to also eliminate the current account deficit.

4. Inflation-induced shift in the composition of tax revenue

The Israeli experience unequivocally suggests that suddenly stabilizing the economy generated an automatic increase in tax revenues which by itself

^{1/} Alesina and Perotti (1995) show that successful fiscal contractions are typically those that manage to cut the most politically sensitive budget items: government wages and transfers.

helped reduce the public deficit. Furthermore, such a stabilization shifted a tax burden from labor to capital. Since the capital stock is fixed in the short run, such a tax shift generated a short-lived consumption-based boom in economic activity (*a la* Giavazzi and Pagano). However, in the medium (and long) run, the higher tax burden on the accumulation of new capital had a significant negative effect on growth and productivity.

We uncover in this section a marked shift in the functional distribution of disposable income in the sudden transition from high to low inflation in Israel. As mentioned before, the massive fiscal adjustment, which provided the backbone of the stabilization policy package reflected an increase in tax revenues and a fall in subsidies as well as some spending cuts. The increase in the overall real burden of taxes was not shared equally among income groups and across various tax bases. An effective subsidy to capital that characterized the high inflation period had been switched to a relatively high tax burden on capital in the aftermath of the disinflation. At the same time, the real tax burden on labor income went down sharply. Also, a large portion of the revenue increase was due to a significant rise in consumption rates (mostly VAT) which, as by itself like a wealth tax, entails an equal burden on laborers and capitalists.

Economists have long been interested in the inflation tax, defined as the real depreciation of money holdings. The revenue (seigniorage) that the

government obtains is generated because the public holds zero interest-bearing assets in the form of cash and the government requires commercial banks to hold reserves at much below market rates of interest. Eckstein and Leiderman (1992) found that while inflation fluctuated from 40 percent per annum to almost 500 percent per annum, the ratio of seigniorage to GNP remained between 2 to 3 percent. 1/

Tanzi (1977) identified another important and practical aspect of inflationary finance which operates to reduce real tax revenues when inflation rises in opposite direction to the seigniorage effect. Due to collection lags, defined as the time that elapses between the date when the tax liability accrues and the time when the tax payment is received by the government, inflation causes an erosion of the real tax revenue. The collection lag can be shortened to lessen the effect of inflation on the tax system, but such measures are themselves not without costs. For example, when inflation reached triple digits, the filing period for the VAT was shortened from three to one month, thereby increasing both bookkeeping costs and government collection costs. 2/

1/ See also Bruno and Fischer (1986). Nevertheless, the welfare costs associated with this relatively small revenue were quite significant and rising with the rate of inflation.

2/ The Bank of Israel's annual report for 1984 estimated that before shortening the collection lag, the loss of tax revenues due to the Tanzi effect had reached about 10% of the overall tax revenues (see Bank of Israel (1984, p.103)).

The experience with inflation in Israel emphasizes yet another aspect of the effect of inflation on the tax system: the difficulty of properly defining taxable income in the business sector. Taxable income in the business sector is calculated according to standard accounting procedures which are nominal in nature. In other words, one sheqel is treated as one sheqel regardless of the date on which it was paid or received. Nominal business income (or profit) so calculated, which is revenues (or sales) minus costs, is calculated by adding together sheqalim received at different dates (and having different real values) and subtracting from them sheqalim paid on different dates and having different real values. When inflation rates are 100%-500% per annum, a beginning-of-the-year sheqel may be worth, in real terms, as much as 2 to 6 end-of-the-year sheqalim. As a result, nominal income cannot serve as even an approximation of the real income of a business firm in a period of high inflation rates, such as those existing in Israel during the late 1970s and the first half of the 1980s.

Inflation creates several deviations of nominal income from real income. Some of these deviations or biases are negative and some are positive, but the main point is that they do not offset each other. Furthermore, their incidence and magnitude are not independent of the taxpayer's behavior. In other words, a typical taxpayer will take certain tax-avoidance actions that will reduce her calculated nominal income even though her real income remains unchanged. In such a case, a higher inflation rate reduces real tax revenues; and the tax system fails to serve as an automatic stabilizer.

The deviations (or biases) of real income from nominal income that are caused by inflation may be briefly classified into four main categories (for more details see Sadka (1991) or Razin and Sadka (1993)):

(a) Nominal capital gains on an asset have two components: an artificial or inflationary component that merely reflects an increase in the general price level of all goods and services, and a true, real component that reflects the appreciation in the value of the asset that results from fundamentals such as increased demand for, or scarcity of the asset. Thus, nominal income overstates real income by the sum of the inflationary component of capital gains.

(b) Analogous to the distinction between the inflationary and real components of nominal capital gains is the distinction between the inflationary and real components of the interest rate. Thus, allowing deductibility of nominal interest accumulations causes nominal income to understate real income by the sum of the inflationary component of the interest accumulations.

At first glance, one might argue that (a) and (b) above offset each other. On the one hand, inflationary capital gains on an asset are included in taxable income, but on the other hand, the inflationary interest charges incurred for the purpose of acquiring the asset are tax deductible. This argument is invalid on two grounds. First, the purchase of an asset may be financed by equity rather than by debt. Second, capital gains are taxed upon realization whereas interest is deductible on an accrual basis. Thus,

the inflationary component of the interest charges are deductible annually, while the inflationary capital gains on the asset purchased will not be taxed until the asset is sold.

(c) The depreciation allowance on a physical asset is calculated on the basis of the nominal (historic) cost of the asset. In this respect, nominal income overstates real income.

When the monthly inflation rate reaches double digits, an additional major factor causes nominal income to significantly deviate from real income. This factor, which affects operating income, relates to the nature of the production process, which takes place over time.

(d) Output is usually sold at the end of the production process, while the costs of labor and other inputs and raw materials are incurred earlier. Thus, output is sold at high (inflated) nominal prices, relative to the low nominal prices of the inputs. As a result, the nominal operating income overstates the real operating income.

One might conclude that since the various deviations of nominal income from real income are not all of the same sign, the effect of inflation on nominal taxable income, vis-a-vis real income, is ambiguous. However, such a conclusion ignores the long-run response of the taxpaying firm to the effect of inflation on nominal income. In the long-run firms will take

various tax-avoidance measures in order to reduce nominal taxable income. For instance, they will rely to a lesser degree on equity capital and invest more and more in buildings and real estate. Such tax-avoidance activity is further fueled by changes that are made in the tax laws in the wake of inflation - changes that are typically partial, unbalanced and usually aimed at relieving the burden on those sectors negatively affected by the tax treatment of inflation. For instance, one of the first measures taken in Israel was to exempt from tax (or tax very lightly) inflationary capital gains without, at the same time, disallowing the deductibility of nominal interest charges.

Quantitatively, therefore, the deductibility of nominal interest charges combined with light taxation of capital gains (e.g. real estate investments were effectively subsidized) was a main reason for the understatement of capital income. Furthermore, the law permitted self-employed individuals and proprietorships to manipulate the timing of their cash receipts and payment (vis-a-vis some sectors of the economy which were indexed and thus indifferent to such manipulations) in a way that reduced taxable income substantially to ridiculously low levels. In fact, this sector of the economy benefitted the most and substantially from inflation.

Unlike taxpayers in the business sector, wage earners cannot maneuver the time schedule of their wage payments in order to reduce their real tax burden because of the withholding system. This system ensures that any manipulation of the timing of cash receipts for wages earned will have a negligible, if at all, effect on real tax payments.

The bottom line is that inflation stabilization is expected to raise the burden of taxes such as the income taxes on the business sector and the VAT and to reduce the tax burden on wage earners. To confirm this hypothesis, we compute effective average tax rates during and after the inflation stabilization period.

Our computation is based on a stylized tax model in which the economy is aggregated to have three goods: consumption, labor, and capital (see Razin and Sadka (1993) for details).^{1/}

^{1/} Tax revenue is classified according to taxes on labor income, capital income and excise taxes. In our 3-good economy the transfers, b , government good purchases, g , and taxes, t , should be understood as (three-tuple) vectors in line of the 3-good disaggregation. For example, the first component of the b -vector, b_1 , denotes government transfers in terms of the consumption good, while the second and third components, b_2 and b_3 , are transfers in terms of labor and capital. In the case of transfers, however, the last two components of b are typically zero. Similarly on the expenditure side, g_1 denotes purchases of the consumption good, g_2 denotes government hiring of labor services, and g_3 denotes government hiring of capital services from the private sector. The tax vector, t , consists of rate of excises, t_1 , rate of labor income tax, t_2 , and rate of capital income tax, t_3 . We denote the consumer price vector by p (that is, the post-tax price and the producer price vector that is, the pretax price by q). The tax rates are computed from the good-by-good percentage difference between the price vectors p and q . For example, the excise tax rate (in percents) is given by $[(p_1 - q_1)/q_1] \times 100$.

Using this notation, the household budget constraint is specified as follows:

$$px - pe - pb - qy - q_1 B_1^P + p_1 D_1 \leq 0 \quad (1)$$

where, x , e , b , and y denote consumption, endowments, government transfers, and production, respectively; B_1^P denotes the private sector current-account deficit, and D_1 denotes the public-sector deficit. Note that by
(continued...)

Table 1 describes the evolution of the effective average tax rates from the high inflation period to the low inflation period. The table reveals that the effective average tax rate on consumption went up from 6-12 percent during the period of high inflation to 22 percent in 1990. This is due to VAT rate hikes, the cuts in subsidies to necessities (mostly food and public transportation), and the curbing of the Tanzi effect. The effective average tax rate on labor went down from 31-32 percent during the high inflation period to 19 percent in 1990. The effective tax rate on capital, which was negative in the high-inflation period, went up and exceeded the

1/ (...continued)
convention the first component of the production vector, y_1 , which denotes the private-sector gross output, is positive, while the second and third components, y_2 , and y_3 , denoting, respectively, labor and capital inputs, are typically negative. Notice also that under the assumption of constant returns to scale in production the value of the output vector in producer prices, qy , must equal zero. Otherwise, there are infinite profits to be made and this is inconsistent with competitive equilibrium.

An immediate implication of this simplification is that in the single-period model saving (which is equal to future consumption) must be added to current consumption in order to obtain a meaningful indicator of the economy (life time) consumption. Similarly, government deficit (representing future taxes) is lumped up with current taxes to get a meaningful measure of the overall tax revenue.

labor income tax rate in 1990. As explained above, this is due mostly to the fact that inflation erodes the real tax base in the business sector.

1/ In fact, taxes on wage earners accounted for approximately two-thirds of all income tax revenues on the eve of the stabilization program, compared to about only one-third nowadays.

5. What factors caused the post-disinflation immediate boom and subsequent recession ?

An interesting issue is why in the aftermath of the 1985 stabilization program there was first a boom and later a recession. In this section we put forth two possible explanations: (1) a shift in the tax burden from labor to capital and (2) the exchange rate policy. Interestingly, the first explanation has to do with a long term, credible, restructuring of the tax system, while the second, associated with an unsustainable overvaluation of the exchange rate, is based on the policy being not fully credible.

5.1. A tax-based cycle

Recall the shift of the tax burden from labor to capital as a consequence of the drastic disinflation. The lighter tax on wage income could have helped fuel the consumption boom, together with the wealth effect emanating from the elimination of inflation-based distortions. The effect of the shift towards high capital income tax rate can explain why a recession came later, since the capital formation which is directly affected adversely by this tax is typically a slow process. But eventually the tax burden on

1/ This change occurred even though statutory tax rates on business income were sharply reduced.

capital could have caused the decline in the rate of growth of capital and recession. Indeed, while disposable wages have shown a sharp increase (after a very short decline in the first quarter after the mid 1985 program), the capital income tax effect (along with the detrimental effect of high short term interest rate) seems to be the reason behind the fall in the investment-output ratio. The fall in investment spending led to a sharp decline in the capital-output ratio of the business sector which went down from about 1.8 before 1985 to about 1.5 in 1990.

5.2. An exchange rate-based cycle

Using the exchange rate to accomplish further disinflation after the stabilization program led to persistent real appreciation. An examination of similar episodes in high-inflation countries suggests the possibility that there is a common pattern for exchange-rate-based stabilization programs. (See Kiguel and Liviatan (1992) and Calvo and Vegh (1993)). Those countries which rely on the exchange rate as a nominal anchor experience a post-stabilization boom in economic activity, a large real exchange rate appreciation, and a rise in real wages. Later on in the programs, the real appreciation of the domestic currency and the rise in real wages eventually leads to a sharp economic contraction.

If the private sector expects that the appreciating path of the exchange rate is not sustainable. The reason is that it generates persistent current account deficits, which at some point in the future would call for a policy reversal. But an overvalued currency which is perceived to be temporary could generate a consumption boom. Because it creates incentives

to substitute consumption from the future to the present, that is a consumption cycle which drives the post-disinflation business cycle.

However, the 1985 stabilization started with a large real depreciation so that the 1986-7 consumption boom took place when the real exchange rate was relatively high (see Figure 8). With this in the background it is not very plausible that strong expectations for exchange rate policy reversals in the near future could have been developed so as to sustain significant intertemporal substitution in consumption. Thus, in the case of the Israeli stabilization episode, the exchange rate-based explanation is not convincing.

5.3. fiscal discipline

It could be argued that while fiscal discipline was very tight immediately after the stabilization, it became gradually more lax later on. The Mundell-Fleming model predicts that this pattern of the fiscal stance can deliver a gradual process of real appreciation. This could have contributed to the emergence of the recession down the road.^{1/}

5.4. Another effect

^{1/} According to Frenkel, Goldstein, and Masson (1991) and Giavazzi and Pagano (1988), fixed exchange rates afford more fiscal discipline than flexible exchange rates, because by adapting a lax fiscal policy under the fixed exchange rate system, international reserves will eventually be exhausted; thus putting an end to the peg. The collapse of the system is costly for the authorities. Therefore, the fear of suffering the political punishment will discipline the fiscal authorities under the fixed exchange rate system. However, as Tornell and Velasco (1995) argue, there is also a similar flip side to a lax fiscal policy under a flexible exchange rate system. Unsound policies lead to an immediate depreciation of the currency (hence inflation). Since inflation is costly for the fiscal authorities, forcing the political costs upfront in the flexible system can provide more fiscal discipline.

As we describe in Razin and Sadka (1995a) the overvaluation of the exchange rate imply that the prices of low labor-intensive tradable goods fall relative to the prices of high labor-intensive nontradable goods . Thus, through the Stolper-Samuelson effect, wages rise relative to capital rental values. This change in the relative prices could help explain why the (pretax) share of labor income in GDP has increases significantly. ^{1/} Similar to the tax shift noted above, this income redistribution between labor and capital could have been a driving force behind the post-disinflation cycle.

6. Tax Smoothing, Immigration and the Government Finances

When the government levies taxes, it does not only transfer resources from private hands to public use. The tax-transfer process entails also some waste of resources. Put differently, when the government raises one dollar in tax revenues, private losses amount to more than one dollar. The difference between the loss and tax revenue is called the excess burden (or

^{1/} There is a striking similarity to the German episode in the early twenties. In the aftermath of the successful disinflation there were negligible transitional costs since neither industrial production did decline nor unemployment rose (see Garber (1982)). The German economic decline started 1-2 years after the sudden end to the hyperinflation. In the German post disinflation period the relative prices of labor-intensive goods increased together with the wage-rental ratio, and there was a significant increase in the share of labor in national income.

the deadweight loss) of taxation. Some important studies have shown that the deadweight loss could be very substantial and reach at the margin as much as 50 cents per dollar of tax revenues. 1/2/

This all means that it would not be optimal to continuously maintain a balanced budget by raising tax rates whenever spending increase or output falls. Rather, if these changes are not persistent, it is desirable to adjust tax rates only slightly and let future taxpayers chip in by raising the deficit and, consequently, the debt. Similarly, a transitory fall in spending or increase in output should not be met by one-to-one cuts in tax revenues. Instead, surpluses should be created and the public debt reduced. An implication of this policy prescription is that the ratio of the public debt to GNP cannot by itself serve as a policy target in the short run. On the contrary, it should serve in the short run as a shock absorber for non-persistent shocks in spending and/or output. Put differently, the fluctuations followed by the public debt are a mirror image of the tax smoothing policy prescription. It is only in the framework of multi-year averages that the ratio of public debt to GNP can serve as an important target of public policy.

1/ See, for instance, Edgar Browning (1987). Furthermore, it is likely that the marginal excess burden rises when the average tax burden (as measured by the ratio of tax revenues to GNP) rises. Therefore, an optimal long-term tax design, which aims at minimizing the present value of the stream of excess burdens, would tend to smooth the path of tax burden over time.

2/ See Barro (1979).

Hercowitz and Strawczynski confronted the tax-smoothing policy prescription with evidence from Israel during the years 1961-1989. They specified stochastic processes for the deviations of output and government spending from a common linear trend over time. Assuming a constant average tax burden (a la tax smoothing hypothesis), they derived the implied path for the evolution of the public debt as a function of these deviations. Their method of analysis built on the premise that the average tax burden was in fact fairly constant and the evolution of public debt was mainly determined by variations in expenditure. The derived debt evolution is shown to fit the data relatively well, thereby supporting the tax smoothing hypothesis. However, their methodology lumps together tax smoothing episodes with others which the intertemporal tax balance fails to exist, such as the sharp growth of public debt during the high inflation period, which are evidently inconsistent with the tax-smoothing hypothesis.

A brief overview of the evolution of the public debt, output and government spending can also serve to illustrate the validity of tax smoothing hypothesis (see Figure 9). Noteworthy is the period 1966-1978 which covered two wars (the six-day war of 1967 and the Yom Kipur War of 1973). As seen in Figure 9b, this period is characterized by a significant growth of government spending (led by defense expenditures), well above the growth of output: the percentage of government spending out of GNP rose from 40 to 80 with two discrete jumps in 1967 and in 1973. Evidently, tax burdens were not raised accordingly so that the ratio of public debt to GNP, as depicted in Figure 9a, rose from about 60 to 150 percent. In the period

following the 1985 stabilization, the ratio of public spending to output fell significantly, but again tax burdens did not follow suit, and the public debt to GNP ratio fell sharply. Indeed, the pre-stabilization period is a striking example of significant deviations from tax smoothing. Accumulating deficits tends to shift intertemporally the bulk of the tax burden into the future, thereby reducing consumer's real wealth. Thus, by suddenly halting the process of growing public debt, as was the case with the successful stabilization policy, the government was able to restore some intertemporal balance to the burden of taxes. This is a plausible reason why the tax hike elements of the stabilization policy were initially expansionary (similarly to the Giavazzi-Pagano effect).

Now, a special attention should be paid to the recent immigration experience. During the years 1990-1994, about 600 thousand immigrants, mostly from the former Soviet Union, arrived in Israel (about 12 percent of the pre-migration population of Israel). Civilian government spending for the absorption of the migrants (housing, training, investments in infrastructure, etc.) rose significantly. The government adopted a labor absorption policy which facilitated the job search process for the immigrants. The housing market response to immigration, aided by various

government incentives, was a key element in enhancing the mobility of labor 1/.

In spite of a check on defense spending and other public services budget deficit rose significantly at first. However, government finances in a broader sense did not worsen as the ratio of public debt to GDP declined.

Real wages in Israel, particularly in the business sector, proved more flexible than what many economists previously thought. Unit labor costs fell, and together with a housing boom, stimulated a revival of output growth (see a set of labor market indicators in figure 10). At the same time inflation did not pick up. On the contrary, the rate of inflation in 1992 went down to a one-digit level for the first time after the Yom Kipur War of 1973. Output growth reached an annual average rate of about 6 percent. As a result, the ratio of government spending to GNP fell from 58.7 percent in 1990 to 54.0 in 1994. Interestingly, tax burdens did not fall by the same extent, so that the public deficit, as a percentage of GNP, declined from 4.2 percent in 1990 to one percent in 1994. Similarly, as mentioned above, public debt fell from 124 percent of GNP at the end of 1989 to 92 percent at the end of 1994.

1/ The government followed a "direct absorption" approach designed to minimize involvement in the absorption process. The budget provided a standard "absorption basket" of about \$7,000 per family of three during the first year, as the main economic assistance instrument, and the immigrants themselves were left to determine the best use of their resources and location of residence and work. In addition, the budget included other immigration-related outlays for: (i) the construction of housing and mortgage lending; (ii) language and professional training; (iii) wage subsidies for new employees in the manufacturing and construction sectors for a limited time; (iv) enhanced infrastructure and education expenditures. The relatively free mobility of immigrants across jobs and geographical areas contributed significantly to the quick integration of immigrants into the labor market.

Israel thus provides a striking example of a sudden increase in the labor force that has been smoothly absorbed, generating output growth, no inflation, and a fall in the public debt to output ratio. Although the German unification provides another example of tax smoothing, it is opposite in direction to the Israeli migration experience. The German unification (which amounts to an absorption of about 17 percent of the labor force of the pre-unification West Germany) similarly required massive government spending but it did not simultaneously generate output growth. As a result, the ratio of public spending to output thus rose sharply in Germany. The tax burdens did not rise immediately to the same extent. Large public deficits ensued, resulting in a growing public debt to output ratio. The main difference of the Israeli experience compared to Germany is that the Israeli immigrants got jobs whereas the East German workers lost jobs. Thus, while the East German workers priced themselves out of the market (thanks to strong trade unions and the East-West currency union at terms which were unfavorable to east german employment). Accordingly, one can observe that real wages in Israel fell while East German wages increased (see Figure 10).^{1/}

7. Conclusions

The main conclusions from the Israeli budgetary developments may have more general validity: (a) Deficits lead to inflation and stopping inflation

^{1/} When wages are rigid (due to unionism, search costs, efficiency wage elements), migration ,or labor market integration of previously two separate markets, may lower income of established population (see, Razin and Sadka(1995b)). Relatively low job search and labor mobility costs, aided by flexible housing market, and wage flexibility, can explain why there has been little resistance to migration in Israel while there exists relatively strong resistance in some European countries.

requires elimination of deficits; (b) A major effect of inflation is a large shift of the tax burden from capital to labor; (c) Aggregate demand effects of fiscal stabilization are not large due to debt neutrality, in low-debt cases; (d) Aggregate demand may rise with severe fiscal contractions in high-debt cases; (e) When the exchange rate is used as a nominal anchor, in the presence of international capital movements, the economy typically ends up with overvalued currency which eventually leads to recession; (f) Inflation-induced and disinflation-induced redistributions of the tax burden between capital and labor cause a post stabilization output\employment cycle; (g) Shocks to labor supply, such as massive labor inflow through immigration, can be absorbed without worsening government finances, when the labor and the housing markets are sufficiently flexible. (h) Productivity increases with a significant lag, however, in the presence of large inflow of skilled labor. Only after the beginning of a job upgrade, that accommodate skills which the new workers brought with them, there will be productivity gains. Furthermore, the learning by doing on downgraded jobs that initially these workers accept, will also show up as an increase in productivity with a significant lag.

The main policy lesson that could be drawn from the Israeli experience is that the absence of budget discipline, coupled with an almost inevitable monetary accommodation, will eventually fuel an inflationary process that could run out of control. The huge budgetary expansion in Israel and the associated monetary expansion was initiated by wars and severe terms of trade shocks (the oil crises). At the same time, there were the usual attempts in a democracy to "cater to the people" by subsidies to

necessities, other transfers, cheaper public education, as well as some " supply-side economics" measures. As we have shown, the emergent inflation proved in the end to be extremely detrimental to income distribution objectives, to factor productivity and to economic growth. Inflation undermined the tax system and tilted the income distribution in favor of capital and against labor. Even worse, the inflation-induced tax concessions to capital were highly distortionary without having any positive effect on growth.

Several attempts to curb inflation without fiscal consolidation were made but proved futile. A critical element in the successful stabilization policy of 1985 was the elimination of the fiscal deficit. The restoration of the tax system in a background of a relatively stable economy proved beneficial to labor. Interestingly, in this episode private savings reacted to a large extent according to the debt-neutrality hypothesis "a la Ricardo."

Also of interest, the budgetary expansion associated with the absorption of the massive wave of immigration from the former Soviet Union was not reflected in growth of public debt in a relative sense even though the tax burden was not raised. This surprising outcome occurred because output was capable of responding swiftly to the increased aggregate demand, by the utilization of excess capacity of capital (residual of the post-stabilization recession) and high labor force participation rates among the newcomers.

Even though a casual eyeballing overview of the data may suggest the chance of a gain in the so-called deficit gamble (owing to the differential between the growth rate and the interest rate, see Ball, Elmendorf and Mankiw (1995)), we caution the reader. Our analysis of the economic distortions and social evils of weak fiscal discipline, with large deviations from the tax-smoothing policy rule, and the effect of a deficit policy on lowering the chance of winning in the deficit gamble, should serve as a clear warning against such a gamble.

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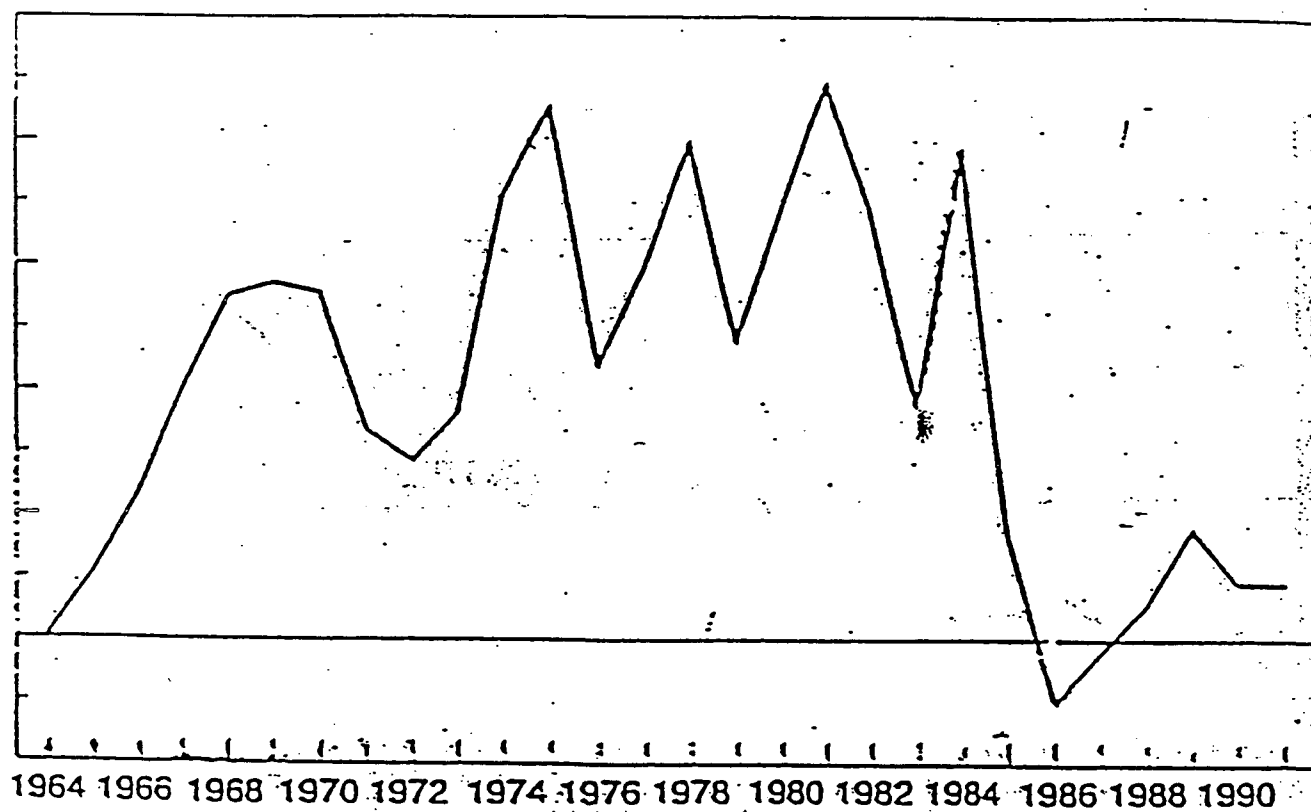
Table 1 - Effective Average Tax Rates (%)

Type of Tax	1980	1985	1990
Consumption	6.4	12.1	22.3
Labor income	31.0	31.6	19.2
Capital income	-4.4	-34.8	34.5

This change occurred even though statutory tax rates on business income were sharply reduced.

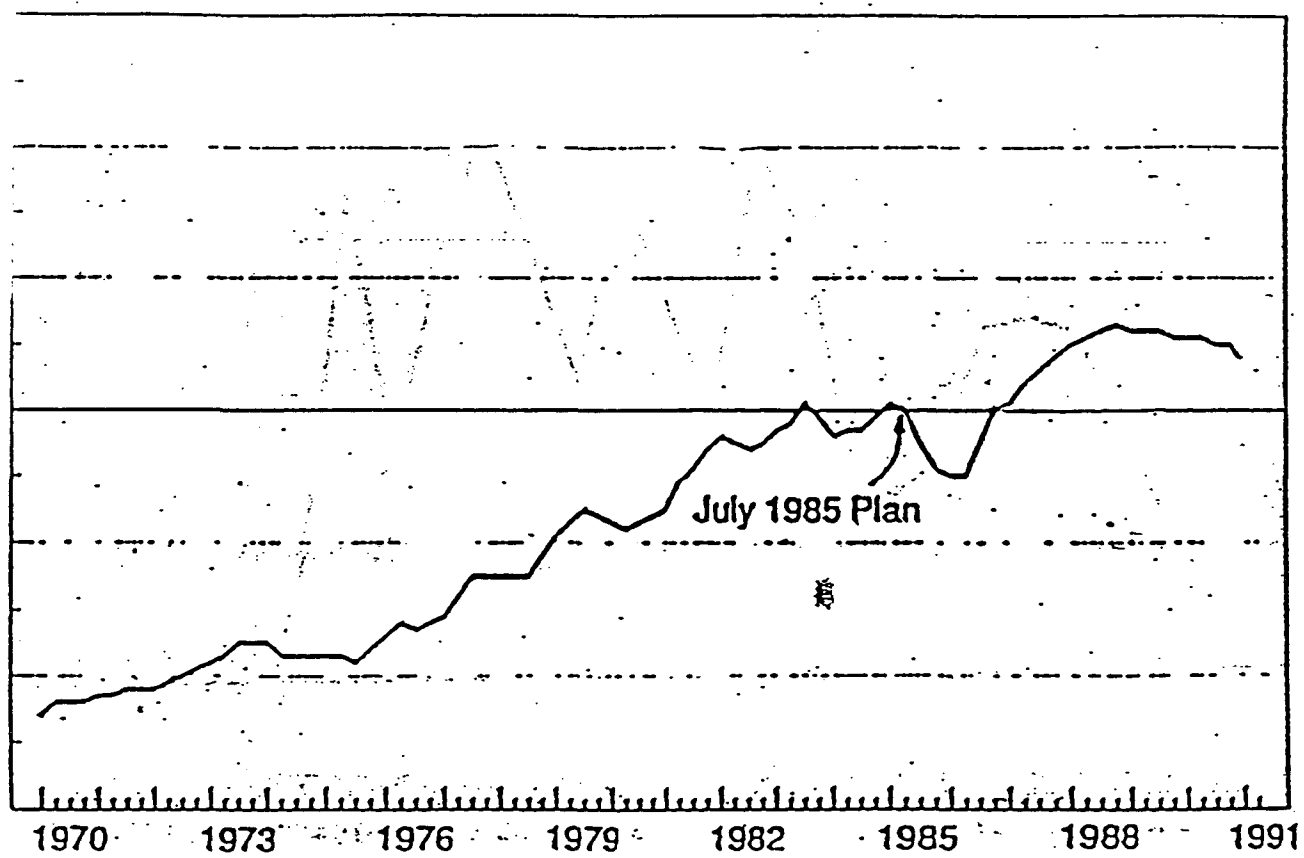
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Figure 1. Total Public Sector Deficit



- 28.0 - 42 -

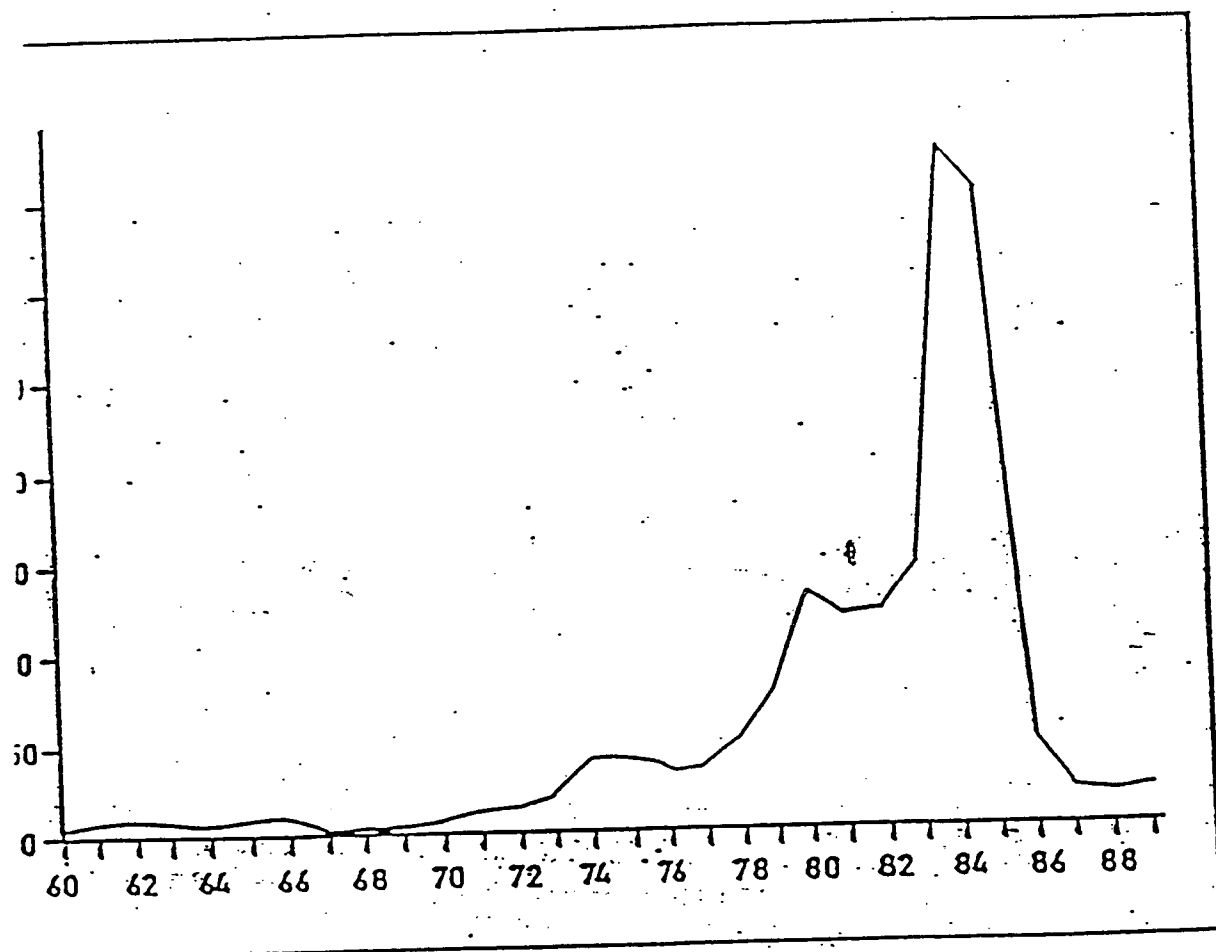
Figure 2. Real Wage in Manufacturing



Source: Bruno (1993).

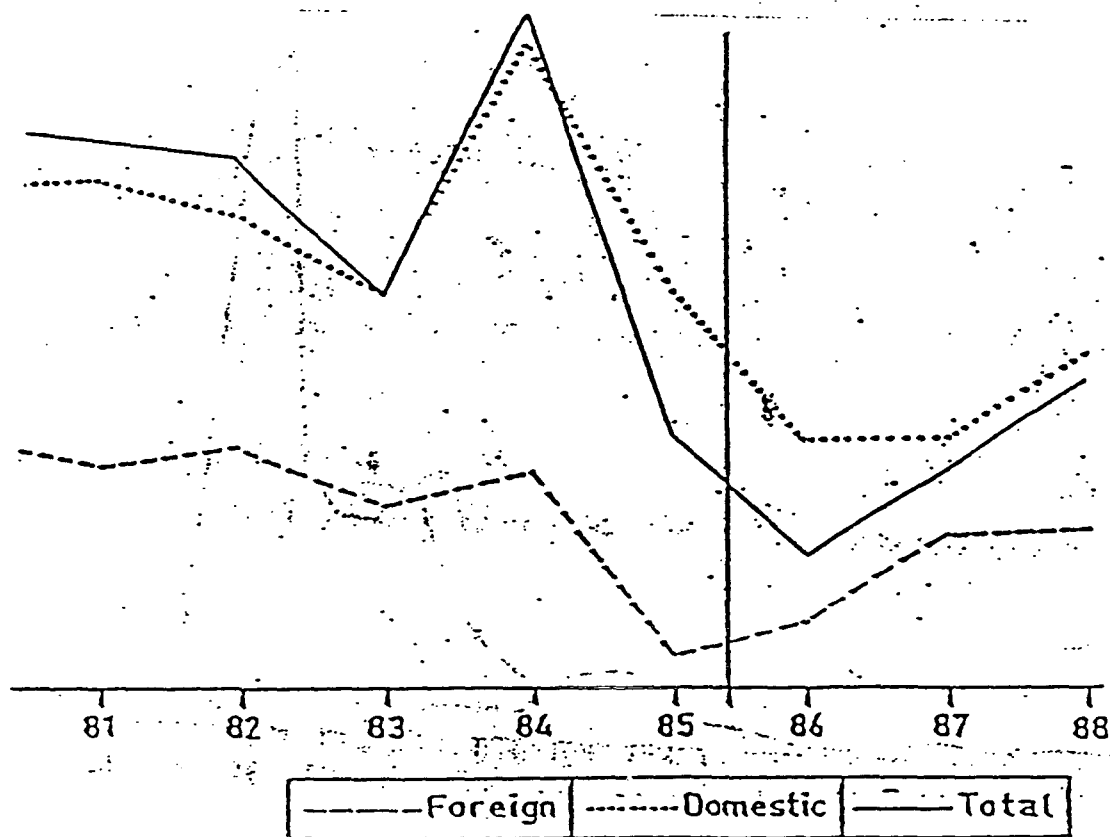
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Figure 3. Annual Inflation Rate, 1960-89



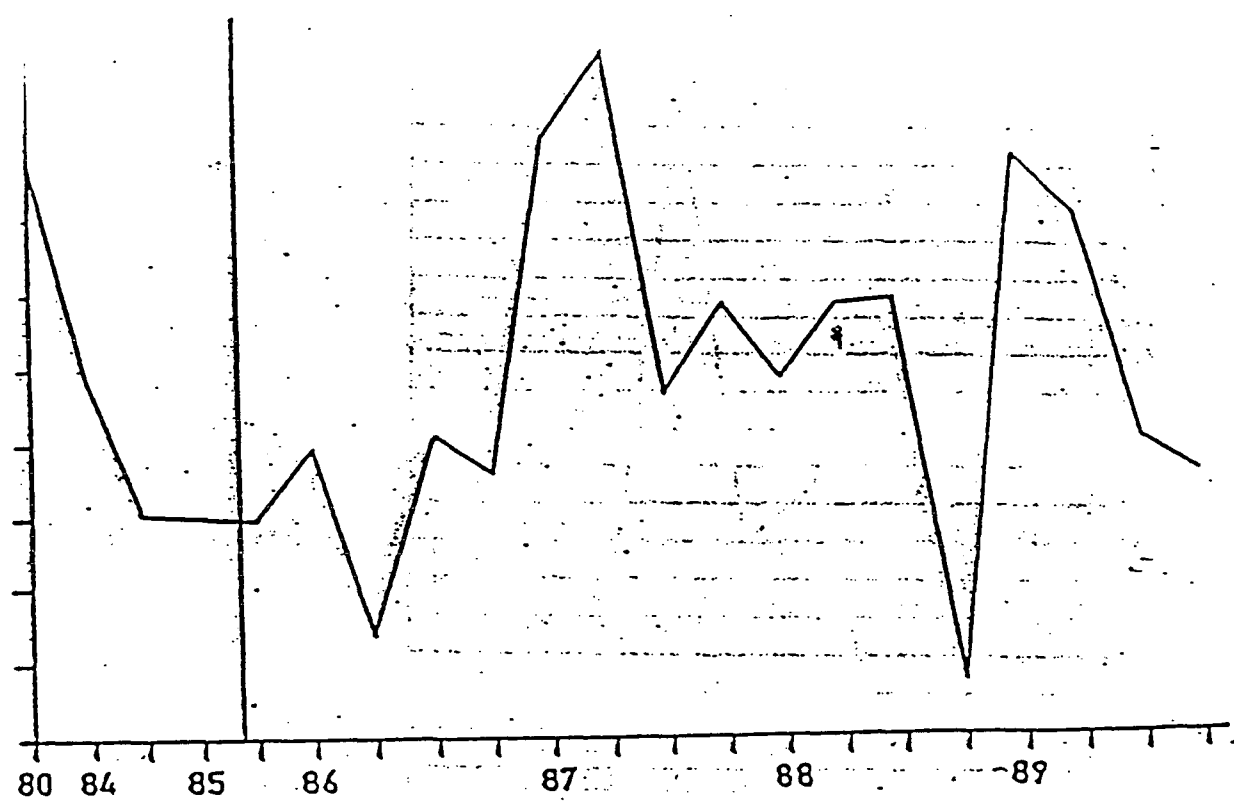
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Figure 4. Budget Deficit (positive) or Surplus (negative), as a Percentage of GNP, 1980-88



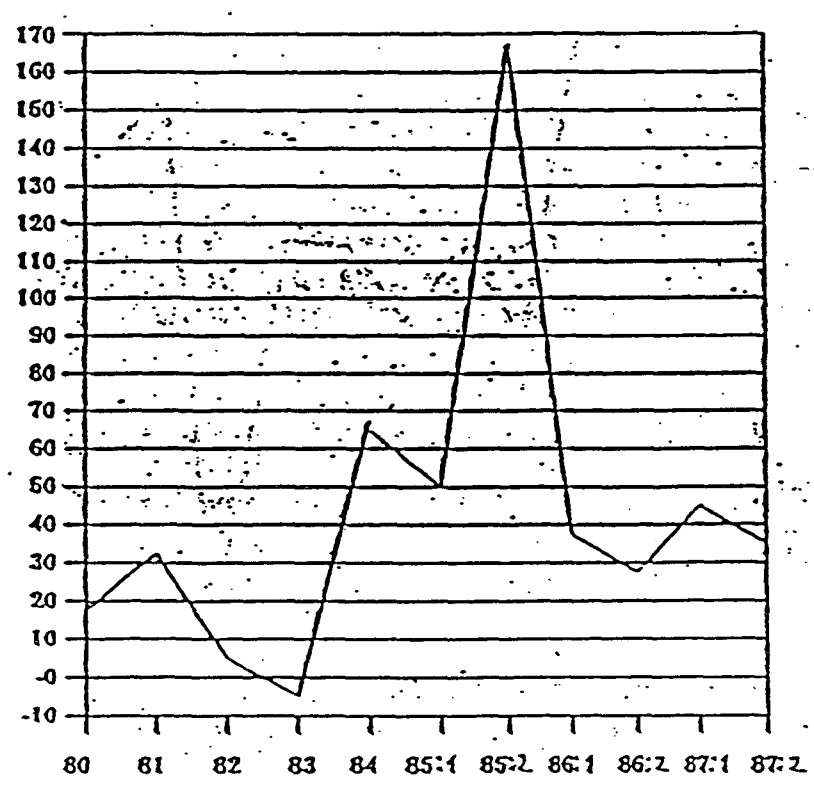
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Figure 5. M₃ Developments, 1980-89 (nominal, quarterly rates of change)



-6.24- 48

Figure 6. The Real Cost of Bank Credit, 1980-87



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Figure 7. Private and Public Savings, as Percentages of Total Income
(GNP, plus Unilateral Transfers).

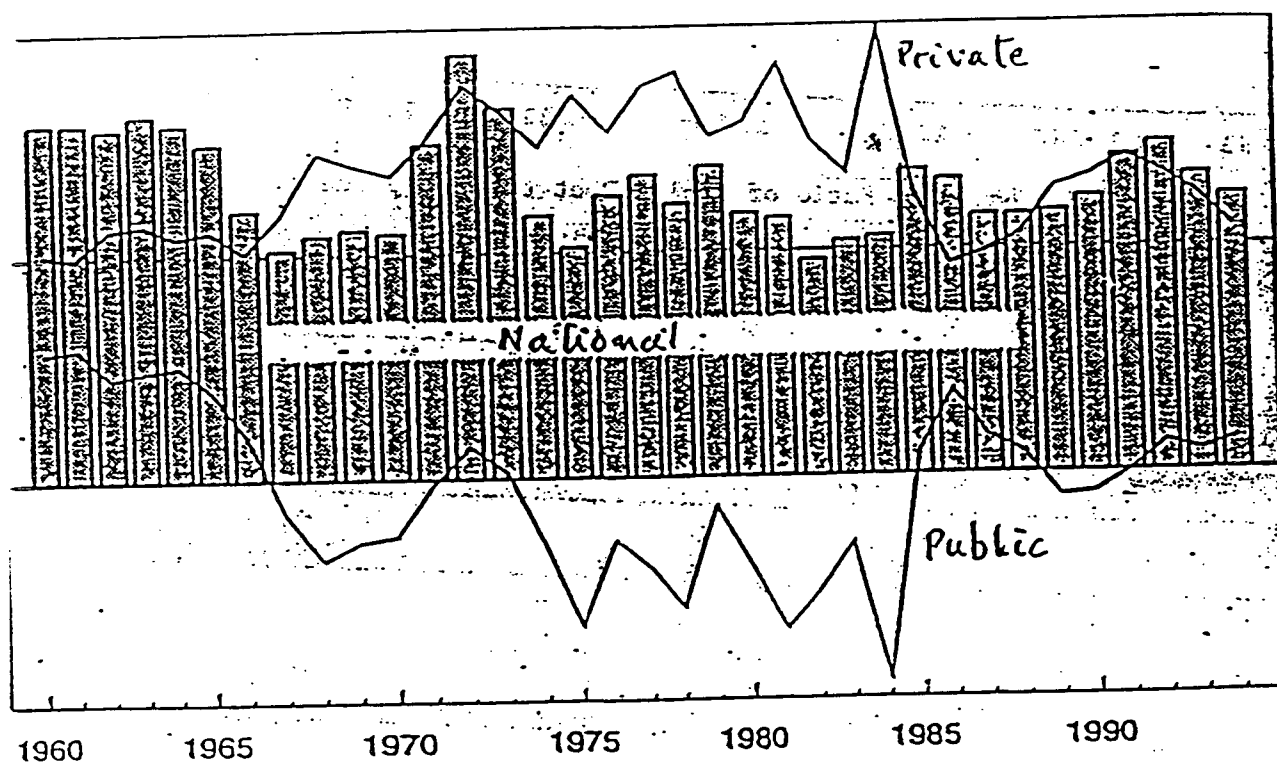
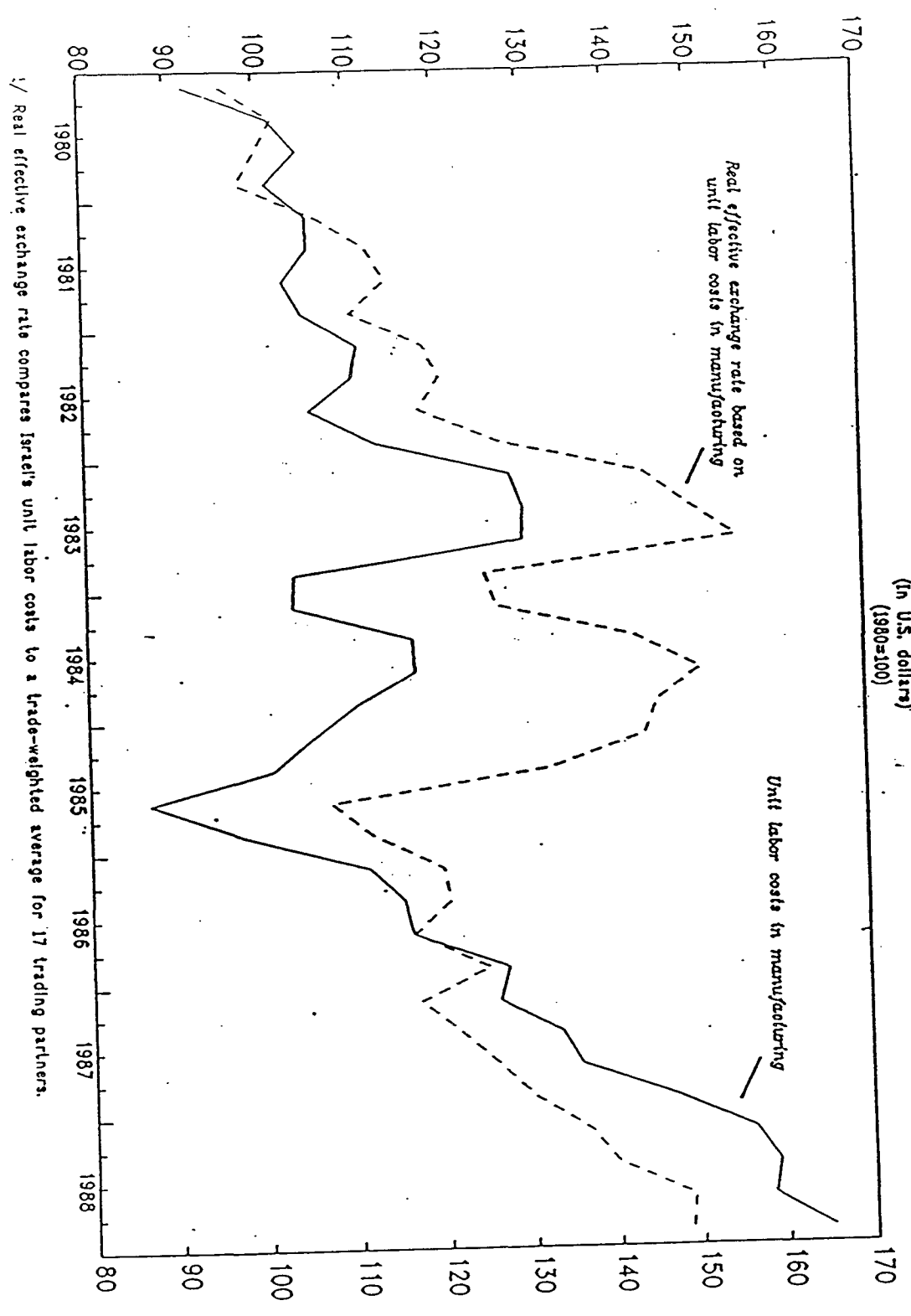


Figure # 8

UNIT LABOR COSTS AND REAL EFFECTIVE EXCHANGE RATE 1/

CHART # 8
~~SECRET~~
 (in U.S. dollars)
 (1980=100)



1/ Real effective exchange rate compares Israel's unit labor costs to a trade-weighted average for 17 trading partners.

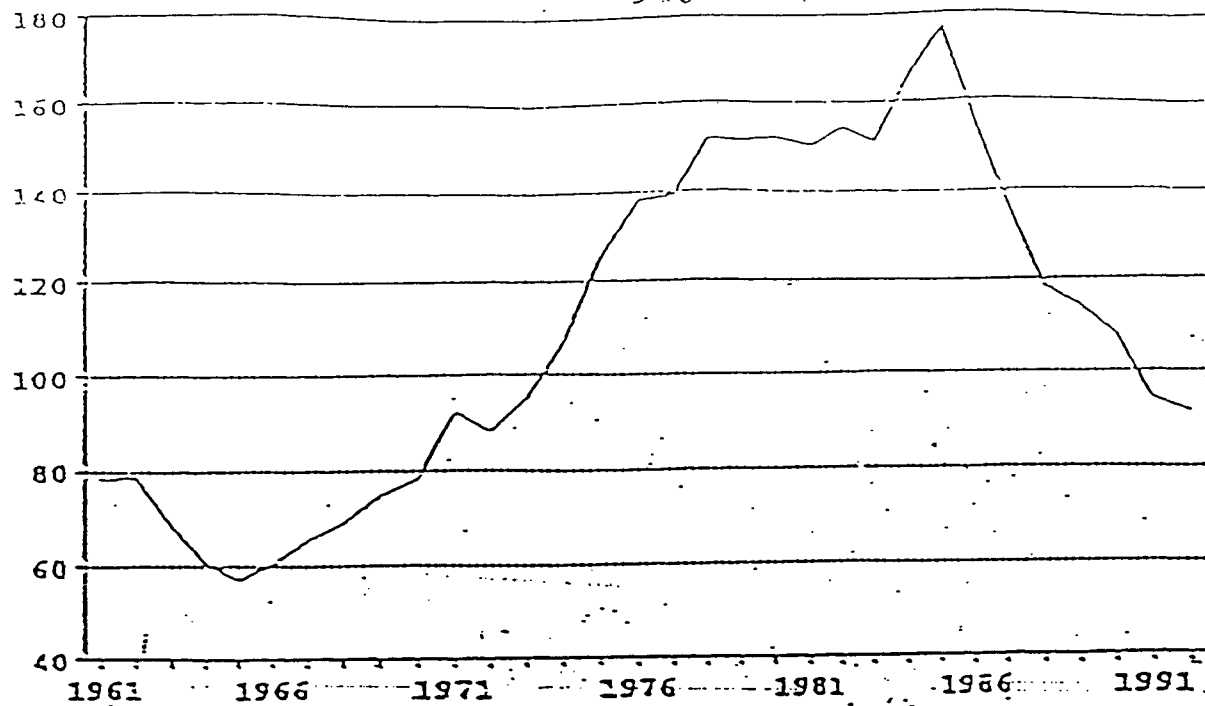


Figure 8a. The Ratio of Public Debt to GNP (percent)

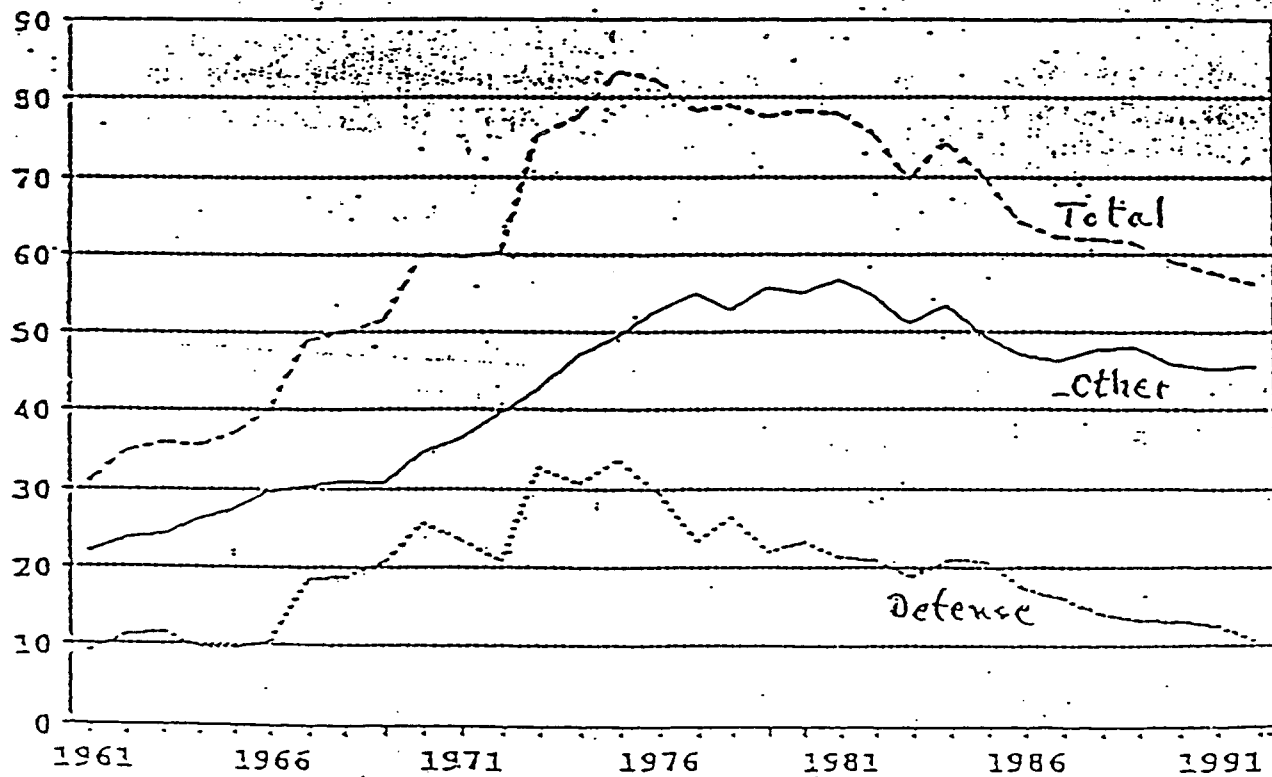


Figure 8b. Public Spendings (percentage of GNP)

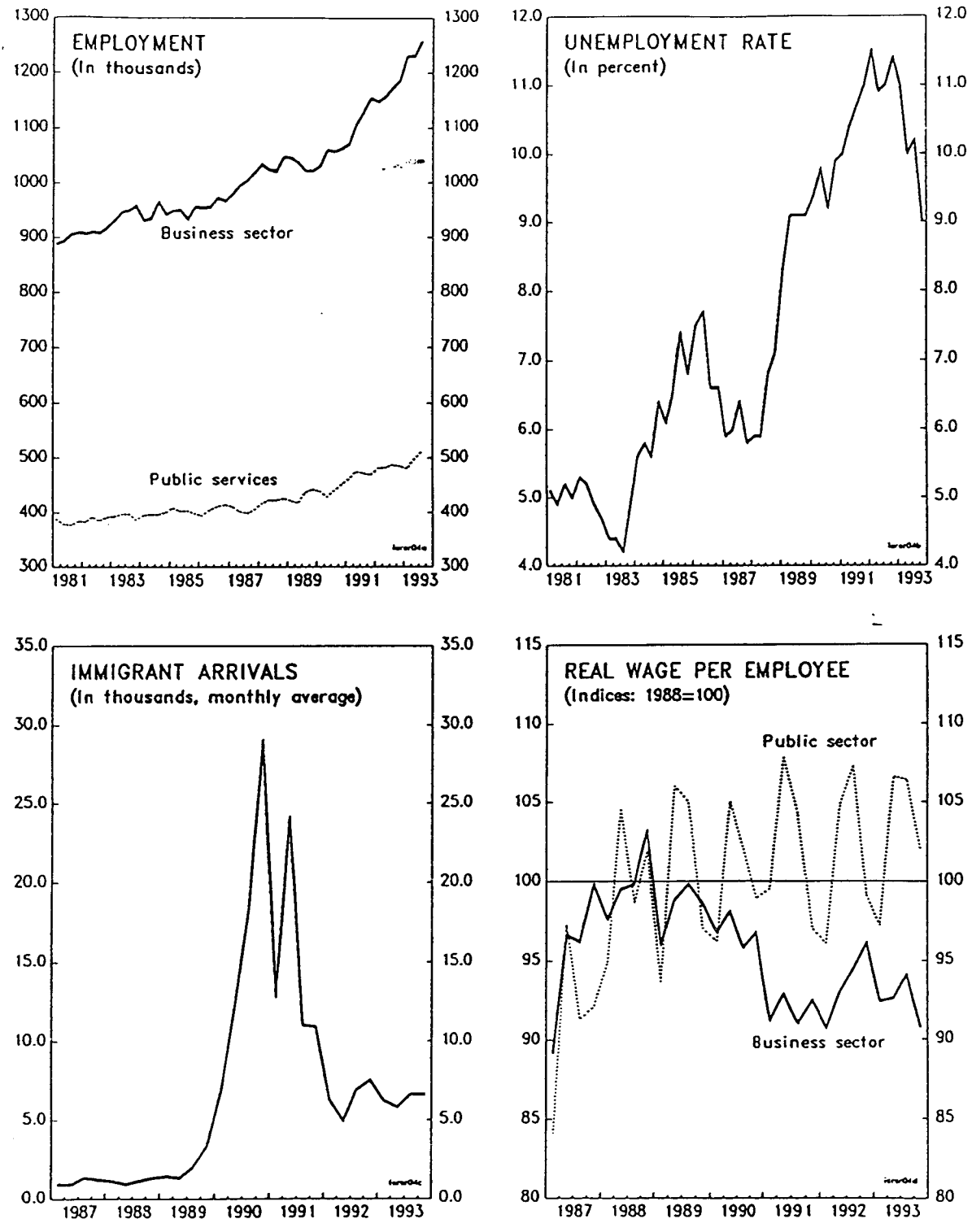
Source: Hercowitz and Strawczynski (1994).

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CHARTS
ISRAEL

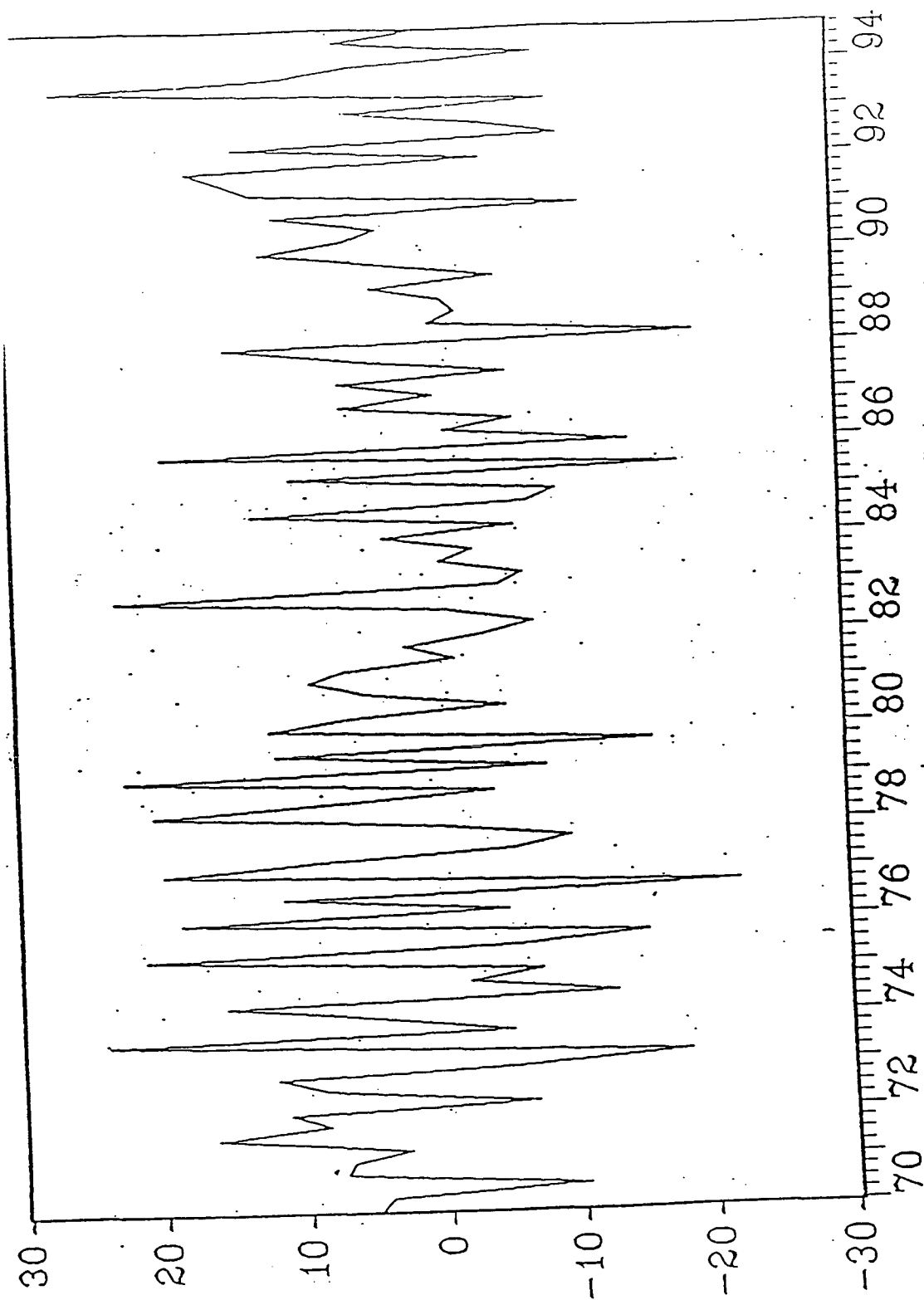
Figure 10

SELECTED LABOR MARKET INDICATORS



Source: Bank of Israel.

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Figure 8. The Differential Between Output Growth Rates (g) and Interest Rates on Indexed Government Bonds (r)



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