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Fighting Hyperinflation: Stabilization Strategies
in Argentina and Israel, 1985-86

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Abstract

In the middle of 1985 Argentina and Israel launched frontal attacks on inflation. Both countries succeeded in reducing inflation drastically during the first year without very significant costs in terms of employment and output. Despite basic differences in the two countries' structures, the programs were extremely similar in their design and their effects. This paper covers some of these similarities in the implementation and the results of the two stabilization programs, and analyzes the rationale of the underlying conception of the plans. The paper concentrates on the strategy for effecting the transitional period, and it also examines the ability of the programs to establish a path of sustained stability.

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I. Introduction

In the middle of 1985 both Argentina and Israel launched frontal attacks on inflation. This was not surprising since both countries were approaching hyperinflation. What was somewhat surprising was that, despite basic differences in the structure of these economies, the programs were extremely similar in their design and in their effects. 1/ Since both countries succeeded in reducing inflation drastically during the first year without incurring very significant costs in terms of employment and output, it is important to analyze the characteristics of the plans and to consider to what extent they also led to the establishment of a path of sustained stability.

The first part of this paper describes some of the similarities in the design, implementation, and results of the stabilization programs. In general, both programs were based on a mixture of broad traditional contractionary measures with relatively tight incomes policies. The nature and the initial results of these measures are discussed in this section.

The large amount of similarities in the two plans, both at the conceptual and at the operational levels, do not seem to be accidental but rather seem to be the consequence of a perception common to both countries about the nature of the inflationary process. The second part of the paper analyzes the rationale for this perception which led to the adoption of the specific type of shock policies used. In this section, we emphasize the argument that there is a connection between the use of price freezes and the application of demand policies which led to some degree of temporary overadjustment of real variables and, in particular, to an "overshooting" with regard to wages and interest rates. It is argued that such overadjustment was required in the transition to facilitate the implementation of the price freeze by reducing the need for administrative supervision. The need for the price freeze itself arose from the perception that inflation in these countries contains a large inertial component that is difficult to handle using gradualistic methods. The connection and the implicit trade-off between incomes policies and the degree of the adjustment needed has not been brought up in previous literature, and is central to an understanding of the short-term dynamics of stabilization programs.

One of the striking similarities in the short-term dynamics of stabilization in the two countries is related to the time profile of the overshooting of real wages and interest rates. In both countries the overshooting was equally severe and lasted a similar time span. It is also remarkable that the real effects of the programs, on employment and output, followed similar patterns. Some explanations are given for these similarities.

1/ See, for example, Dornbusch and Fischer (1986), Dornbusch (1986), Fundación Mediterránea (1986), Bruno (1986), and Liviatan (1986a).

While most of the paper concentrates on the strategy for effecting the transition from high to low inflation, it also examines the ability of the programs to establish a path of sustained stability. It is emphasized that, although the initial shock brings, usually, remarkable success in terms of inflation, the transition to longer-term stability and the overall sustainability of the achievements cannot be assured without dealing with the "fundamentals" in a proper manner. These fundamentals include a balanced government budget and a sustainable position of the current account of the balance of payments. The paper also develops an analytical framework which formalizes the concept of overshooting and describes the theoretical underpinnings of the approach used. Before the conclusions, some perspective on the issues discussed is provided by an account of the 1967-70 stabilization program in Argentina.

II. Basic Common Features of the Programs and of Actual Developments

1. General features

The first common feature of the programs was the aim of the authorities in both countries to bring down inflation drastically and immediately. This must be seen in the context of their historical record--the failures of both recent attempts in both countries to slow inflation gradually by decelerating the rate of devaluation. 1/ Renewed attempts in Argentina to apply the gradualist approach in late 1983 also proved to be ineffective.

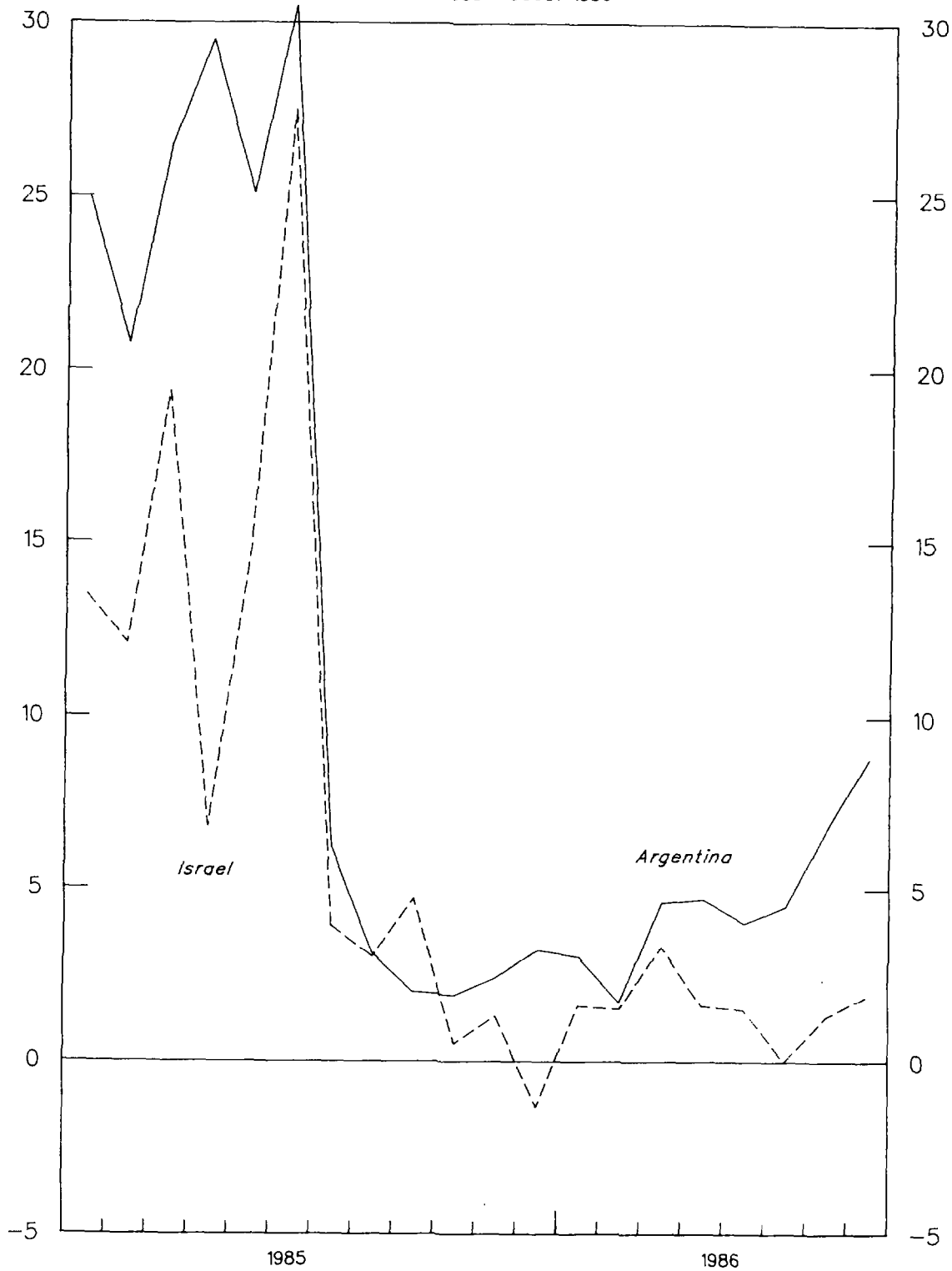
It can be seen from Figure 1 that the programs adopted by both countries in mid-1985 were, however, extremely successful. This success was achieved with the aid of extensive wage-price controls. As the controls were gradually lifted, or became less effective, 2/ the programs were confronted with the first moment of truth: could lower inflation be maintained without controls? While Israel passed this stage successfully, Argentina seems to have encountered difficulties as it shifted from a fixed exchange rate policy to a crawling peg in April 1986 and inflation reaccelerated later in the year.

A second common feature of the programs is their comprehensiveness, encompassing policies directed at all the basic macroeconomic variables. For Israel this was an entirely new approach in dealing with inflation; Israeli authorities had attempted fiscal and monetary restraint (in 1980), exchange rate policy (in 1982-83), and incomes policies (from November 1984 until the initiation of the 1985

1/ Reference could be made to the Martinez de Hoz period in Argentina (1976-80) and the Aridor experiment in Israel (1981-83).

2/ In Israel most of the official controls have been removed in the first half of 1986.

FIGURE 1
MONTHLY RATE OF INFLATION—CONSUMER PRICE INDEX
JANUARY 1985—AUGUST 1986 ¹



¹ Observations for Israel are led by one period.



stabilization plan), ^{1/} but it never tried a fully comprehensive and coordinated strategy. There is no doubt that this approach had a favorable public reception, which, in turn, enhanced the credibility and effectiveness of the program.

In Argentina, on the other hand, a number of comprehensive programs had been tried before (one may mention in particular the 1967-70 program to which we shall return later), and the 1985 program was less innovative. This led to a tendency by the Argentine Government to make stronger commitments--such as introducing a new currency, the Austral, at a fixed exchange rate with the U.S. dollar, and making an explicit commitment not to print money to finance the budget deficit. The eventual failure of fairly comprehensive past plans also created some skepticism and lack of confidence in economic policy, which strengthened the need to reinforce public credibility at the outset of the Austral Plan. ^{2/}

The need for a comprehensive plan is largely dictated by the objective of bringing down inflation immediately. A partial approach may result in serious distortions which could endanger the entire plan; for example, if wage policy were excluded a rise in real wages (in terms of tradables goods) would lead to a balance of payments crisis. However, comprehensiveness is also related to the general approach designed to deal with inertial inflation. A comprehensive plan does not confine itself to nominal policies, but covers adjustments in unsustainable levels of the key macro-variables (such as the current account or public debt ratios). Unlike earlier attempts in both countries, the 1985 programs were based on the conviction that one cannot, and should not, deal only with inflationary inertia when the basic variables (the "fundamentals") are unsustainable.

The need to adjust the fundamentals as part of a strategy of dealing with inertia arises from the consideration that when the fundamentals are unsustainable the public will rationally suspect that the government will have to adopt corrective measures which usually have price effects. For example, a persistent current account deficit is bound to result eventually in devaluations with their consequent price impact, while a growing public debt-income rate will result in eventual inflationary pressures. Inflationary inertia, either institutionalized in backward-looking indexation or based on an entrenched pessimism concerning the government's ability to reduce inflation, cannot be

^{1/} For a discussion of these policies, see Liviatan (1986a).

^{2/} In other words, given the credibility problems and past experience, it seems that the expectational policy measures which have to be used, as well as the fundamental adjustment that underlies expectations, will have to be employed in a more acute manner. This may have implications regarding the degrees of freedom and the flexibility that the Government has during the course of the stabilization experience.

overcome if expectations are that other variables will dictate a continuation of inflation.

The third common feature of the two programs is the synchronization of the policies related to the nominal variables, especially the synchronization of the exchange rate and of wage policies with the price freeze. Such a synchronization of the policy measures when inflation is stopped at a high speed is essential to avoid serious distortions in relative prices in the initial stages of the program.

2. Specific policies

a. The budget deficit

A sharp reduction in the domestic fiscal deficit as a ratio of GDP was one of the centerpieces of the programs in both countries; initially the deficits in both countries were reduced by more than half, or by some 7-8 percent of GDP (Figure 2). Was this budget cut sufficient to deal with the situation?

In Israel the government deficit continued to decline after the initial fall and was eliminated completely in the course of 1986. The domestic deficit of the public sector as a whole turns out to be slightly positive but, with the surplus in the external accounts of government, the overall budget seems to be in balance. ^{1/} In Argentina the deficit rose after the initial decline, increasing recently to around 6-7 percent of GDP, with no offsetting unilateral receipts. The rule of "not printing money to finance the deficit" is by itself not strictly appropriate from the point of view of long-term price stability. If the deficit is financed by the monetization of foreign loans, demand pressure will persist and, even if sustainable in the short run, the growing foreign debt will complicate fiscal management in the future. If such an outcome is expected, it would tend to reduce the current credibility of the plan.

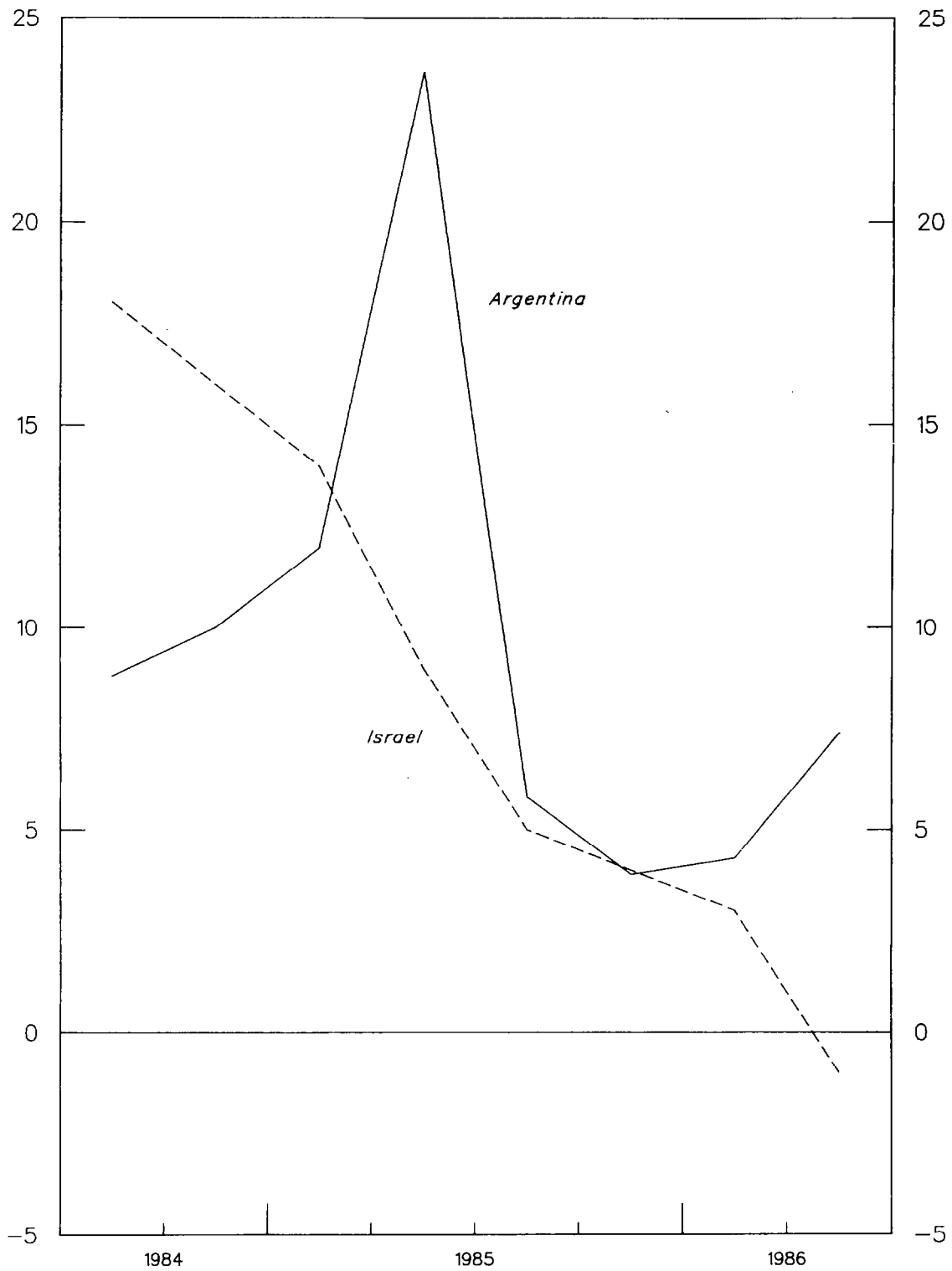
While a complete and full elimination of the fiscal deficit at the outset of the program is not a necessary condition for stabilization, it is important for the expected future path of deficits to be compatible with stability. Indeed there have been successful stabilizations which did not start with an immediate balancing of the budget. ^{2/}

The importance of fiscal policy is a forceful reminder of the need for persistence of the policy. This problem will be addressed in the later discussion of some aspects of long-term sustainability. The point here is that the actual budget cut undertaken in both countries could have been interpreted as a major step toward balancing the budget. However, the fact that the cut was based mainly on an increase in net

^{1/} See Liviatan (1986b).

^{2/} See Dornbusch and Fischer (1986) for the case of the Austrian stabilization.

FIGURE 2
PUBLIC SECTOR DEFICIT AS PERCENT OF GDP
QUARTERLY, 1984 III-1986 II





taxation in both countries and the fact that some of the steps taken were temporary in nature 1/ may have raised some doubts about their long-term sustainability.

b. Exchange rate policy

A fixed exchange rate policy has been used in many successful stabilization experiences but has special significance when the inflationary process is thought to be dominated by inertia. The basic strategy of overcoming inflationary inertia is to create a reality of price stability within the framework of a sustainable path of the real sector of the economy. A fixed exchange rate policy is a basic ingredient of this strategy. A slowly crawling peg could, in principle, serve the same purpose but, in practice, it is much more vulnerable to the resumption of inflation.

The sharp transition to the fixed exchange rate regime vis-à-vis the U.S. dollar (see Figure 3) signifies, more than anything else, the beginning of the stabilization policy. The Israeli plan was more successful in maintaining exchange rate stability through the first year while Argentina shifted to a crawling peg in the second quarter of 1985 (see again Figure 3). Both countries adopted a policy of starting the programs with a large initial devaluation followed by subsequent pegging. This entailed a real devaluation which was intended to provide some cushion against inevitable price increases despite the price controls. However, in both countries the erosion of the real exchange rate against the dollar in 1986 was far greater than the initial devaluation (see Figure 4).

It is important to note that the movements in the real exchange rate against a currency basket (of main trading partners) (see Figure 5) were much more stable for Israel, due to the weakening of the dollar vis-à-vis the European currencies. Because of Argentina's different trade patterns, this stability was much less evident for the Austral. 2/ This larger deterioration of the real exchange rate in Argentina compared with that of Israel may be one of the reasons for Israel's lower and more stable black market premium (Figure 6). 3/

1/ A significant portion of increased revenues arose from emergency taxes, once-and-for-all forced saving schemes and the shortening of collection lags.

2/ In August 1986 Israel shifted to a fixed exchange rate policy against the basket of currencies. It should be noticed, however, that when measured from the beginning of 1985, the real exchange rate in Argentina improved considerably compared with the development in Israel.

3/ Notice that following the introduction of the crawling peg, the black market premium fell sharply in Argentina. However, this development was reverted in August 1986 when the loss of credibility in the program became more widespread.

The strategy of maintaining a fixed exchange rate in implementing rapid disinflation is closely related to the use of price controls. When a price freeze is in effect, an independently active exchange rate policy cannot be sustained, as was the case in the period preceding the Israeli stabilization plan.

c. Overshooting policy in wages and interest rates

The policies followed in both countries led to extremely high real interest rates on commercial credit during the first three quarters of the stabilization programs and to the maintenance, over a number of months, of low levels of real wages. This phenomenon is defined here as "overshooting" in the sense that the levels of these real variables depart, during the adjustment period, from their longer term equilibrium value consistent with stability.

In Israel the slow reduction in nominal interest rates after the initiation of the program led to a plateau of real interest rates of about 5 percent a month around mid-1985, while in Argentina this rate was somewhat lower and more stable due to the introduction of special conversion tables (see Figures 7 and 8). 1/ The calculation *ex ante* of "real" interest rates is, of course, arbitrary because of lack of direct data on inflationary expectations. It is clear, however, that during the first three quarters of the stabilization programs the price freeze considerably reduced short-run uncertainty about inflation so that the estimates of real interest rates, based on realized inflation rates, cannot be very far off the mark. 2/

The emergence of high real interest rates in the early stages of disinflation has been observed in other countries as well (see Dornbusch and Fischer (1986)). One of the arguments advanced to explain this phenomenon is that the monetary authorities are slow to raise the money supply to meet the increased demand for money resulting from lower inflationary expectations (Dornbusch (1986)). This explanation does not seem to be appropriate for Israel where interest rates rather than the money supply are the policy instruments, and the money supply (base money as well as M_1 and M_2) is determined endogenously by the private sector who can exchange it on fixed terms for certain other liquid assets. In addition, banks can borrow funds from the Bank of Israel, at a fixed interest schedule, to cover reserve deficits. Moreover, the possibility was open in both countries for capital inflows, particularly arising from repatriation of capital.

In general, therefore, in a system where the money supply is determined endogenously, insufficient monetization is unlikely to exist and high real interest rates during disinflation could more probably be

1/ Real interest rates are calculated deflating the nominal rate by the previous month CPI inflation.

2/ This, of course, does not apply to the transitional period, i.e., the month during which the stabilization plan is actually started.

FIGURE 3
NOMINAL EXCHANGE RATES
AGAINST U.S.\$

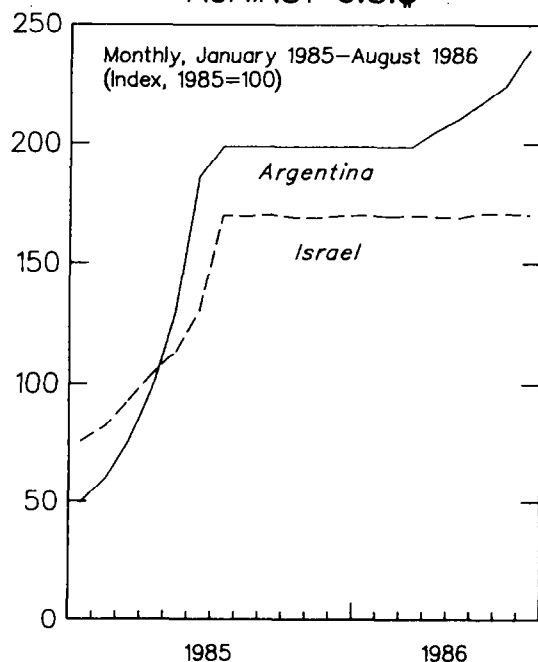


FIGURE 4
REAL EXCHANGE RATES
AGAINST U.S.\$

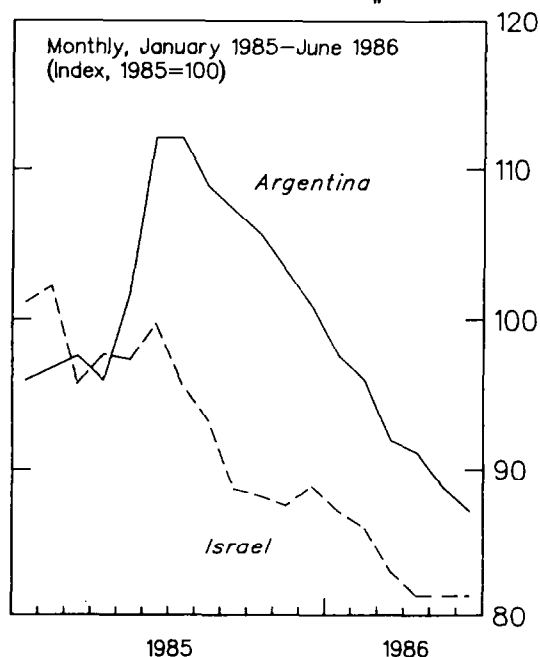


FIGURE 5
REAL EXCHANGE RATES
AGAINST BASKET¹

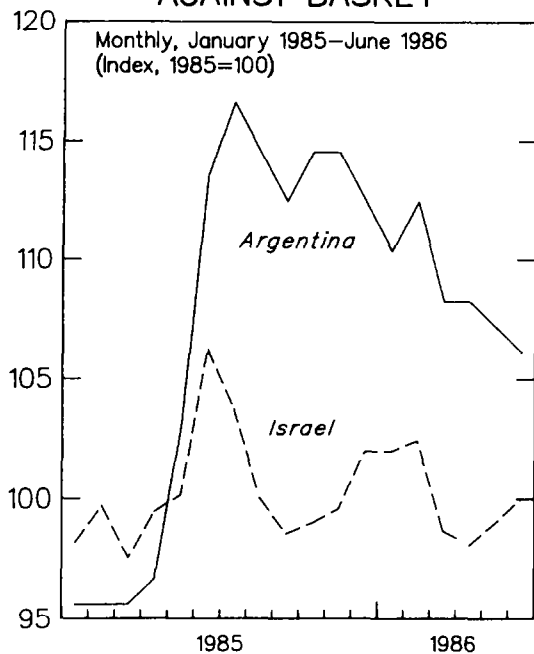
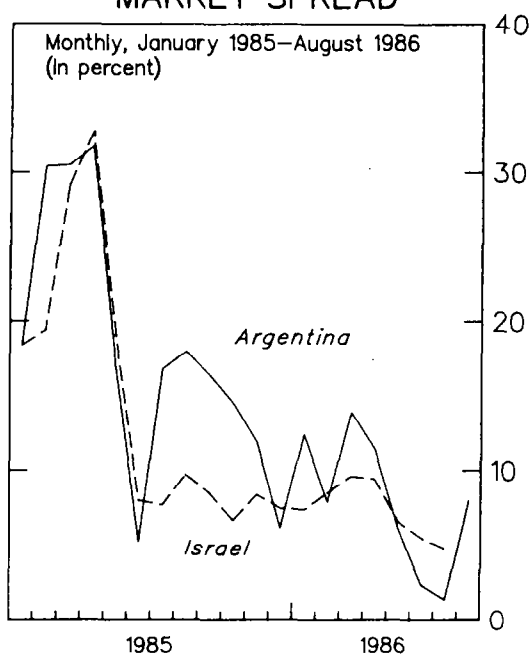


FIGURE 6
PARALLEL EXCHANGE
MARKET SPREAD¹



¹ Observations for Israel are led by one period.



FIGURE 7
REAL INTEREST RATES 1

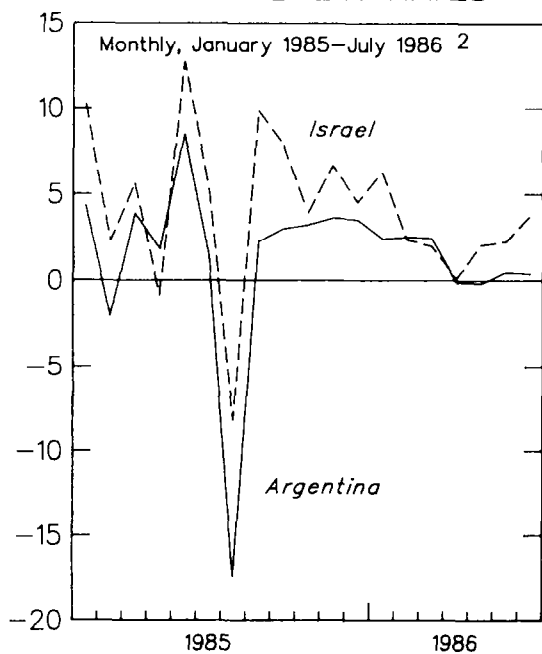


FIGURE 8
NOMINAL INTEREST RATES

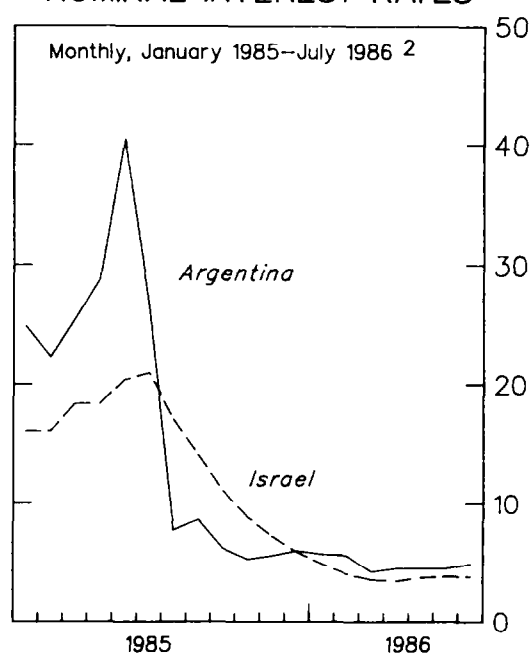
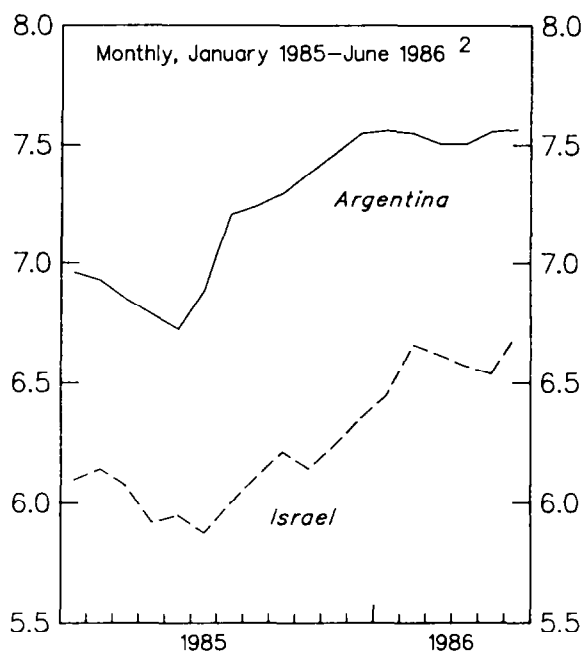


FIGURE 9
REAL M1 BALANCES (IN LOGS),
AT 1985 CONSTANT PRICES



¹ Nominal interest rates are deflated by previous month CPI inflation.

² Observations for Israel are led by one period.



interpreted as part of government strategy. 1/ The monetary authorities may, for instance, wish to maintain high real interest rates to compensate for an insufficient reduction in the budget deficit and to protect a fixed exchange rate against the effects of possible speculation over devaluation. In the following analysis, another important reason is adduced for maintaining very high real interest rates in the early stages of disinflation. This has to do with the incentive to freeze prices effectively with minimal administrative intervention (this point is elaborated later). 2/

The level of real interest rates prevailing in the early stages of disinflation in Argentina and Israel was clearly untenable. Indeed, after the first quarter of 1986 there was a marked downward tendency in these rates, especially in Argentina. In Israel, the estimated real rate on free commercial credit (in domestic currency) dropped in mid-1986 to around 2 percent a month, a still unsustainable level, but much lower than earlier rates. 3/

A second variable subject to short-term overshooting in the two countries was real wages. Within the atmosphere of a national emergency and price freezes, the two governments were able to maintain a U-shaped path for real wages during the first stage of the programs (Figure 10). In Israel the severe, but temporary, cut in real wages that preceded the program was hammered out within the framework of an implicit "social contract", while in Argentina more coercion seems to have been applied.

Unlike a rise in real interest rates, a reduction in real wages has not always been necessarily connected closely with disinflationary programs, 4/ but is to be expected when the government has the political power to impose wage controls. Low real wages at the outset of a program reduce expectations that inflationary methods will be used to erode them further, and may also signal the seriousness of the government's contractionary policies. There is also the traditional argument that a reduction in real wages helps to contain consumer demand (although the temporary nature of the wage cut and the redistribution effects of low-

1/ The remarkable similarity in the growth of real M_1 in the two countries (Figure 9) suggests that the authorities in Argentina were as liberal about the increase in M_1 as in Israel. Consequently, the hypothesis of insufficient monetization seems to be questionable for Argentina as well.

2/ It should be noticed, however, that high levels of real interest rates may reflect uncertainty and the low level of credibility in the whole or in parts of the program, particularly regarding the fixed exchange rule. If such element of risk is present, observed nominal rates may not necessarily represent high ex ante real rates.

3/ With the erosion of credibility and the reacceleration of inflation in Argentina in the third quarter of 1986, the real interest rate rose substantially, to 4.5 percent a month on average.

4/ See Dornbusch and Fischer (1986) for the analysis of real wages in stopping the German hyperinflation.

wage policies weaken this argument), and may also reduce the impact of the monetary and fiscal tightness on unemployment.

These considerations may encourage the government to enforce a temporary wage cut to establish a firm foundation for disinflation. However, another reason for cutting real wages--and one that is related to the use of price controls to reduce inflation drastically--is that they facilitate the management of price controls and reduce the necessary administrative intervention.

The actual movements of wages and interest rates over time in both countries reveal an almost identical shape both in amplitude and in time span. The severe implementation of tight money and real wage cuts lasted for around 8-9 months in both countries.

A possible explanation of the similarity in this type of overshooting of both real interest rates and real wages, in both countries, is their similar initial level of inflation, which seems to have been in the range of 15-20 percent a month. In Israel the actual rate of inflation during the eight months preceding the program was considerably less, but this was due to the system of price and wage controls that suppressed the basic rate. Toward mid-1985, inflation was heading again toward the higher rate. There seems to be a connection between the basic rate of inflation and the time it takes to overcome the "institutional" component of inertia, which is the component that captures the effect of a "catch-up" agreement (such as cost of living allowances). The higher the level of inflation, the shorter are the time lags and, therefore, the shorter the time needed to extricate this type of inertia from the system. The similarity between the inflation rates in the two countries may therefore explain the similarity in the time span of these severe measures.

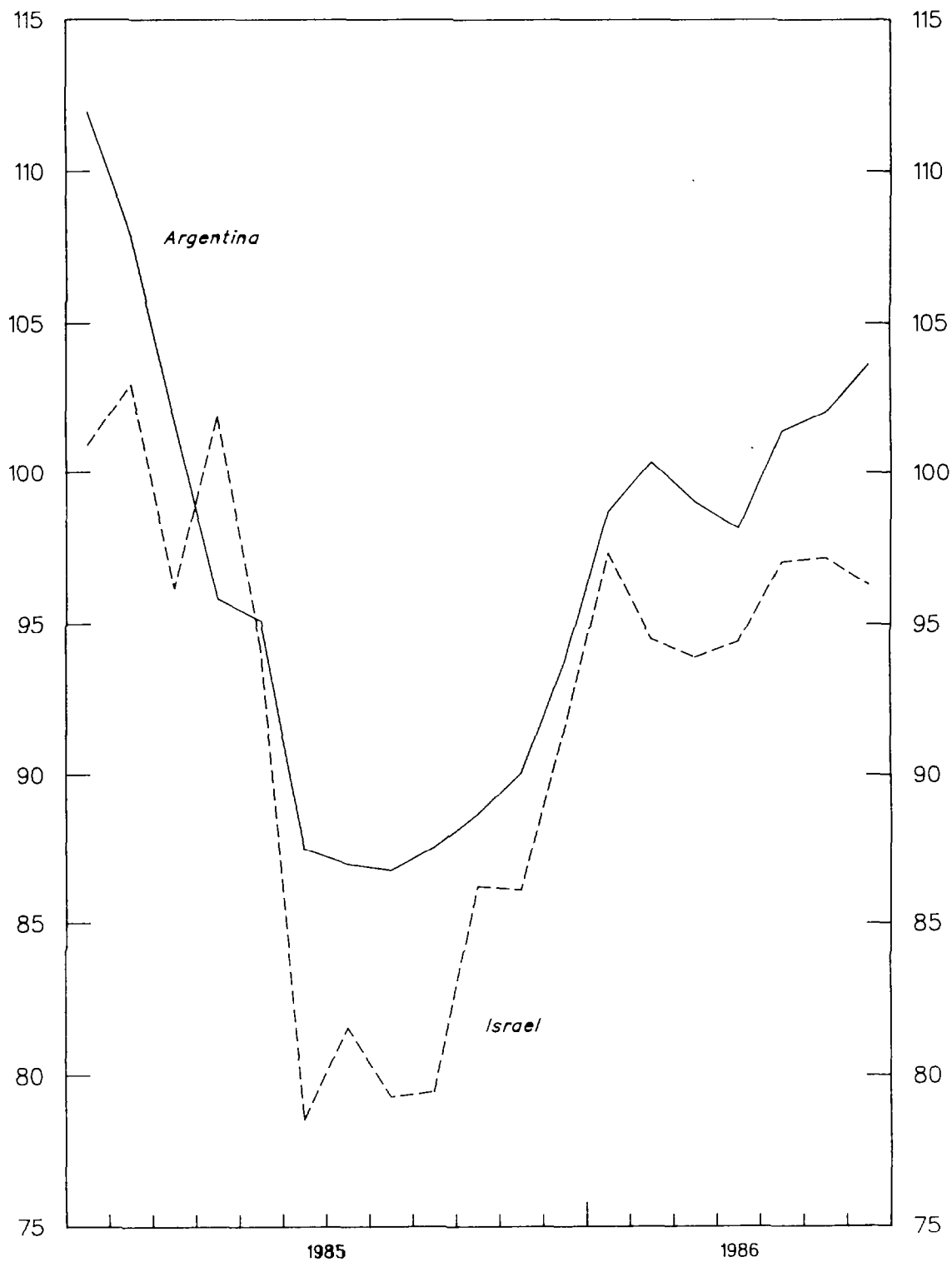
d. Disinflation, employment, and the trade balance

One of the important results of the programs was the relatively small effect they had on employment and production compared with their dramatic effect on inflation. Indices of employment and real GDP (Figures 11 and 12) indicate that the effects of the programs on employment in Israel were small and they were transitory on GDP in both countries, although they also exhibited the U-shapes of the other real variables. Thus, the cost of disinflation in terms of lost output and employment appears to be small so far and, in fact, some acceleration in real growth was evident in 1986.

The behavior of the trade balance during the disinflationary period exhibits some degree of deterioration in both countries (Figure 13) and no visible improvement in the external accounts of both countries could be attributed to the programs.

The less-than-satisfactory behavior of the trade balance is rather puzzling, since it is not, in principle, consistent with the severe

FIGURE 10
REAL WAGE INDICES (1985=100)
MONTHLY, JANUARY 1985-JULY 1986 ¹



¹ Observations for Israel are led by one period.



FIGURE 11
EMPLOYMENT INDICES
(1985=100)

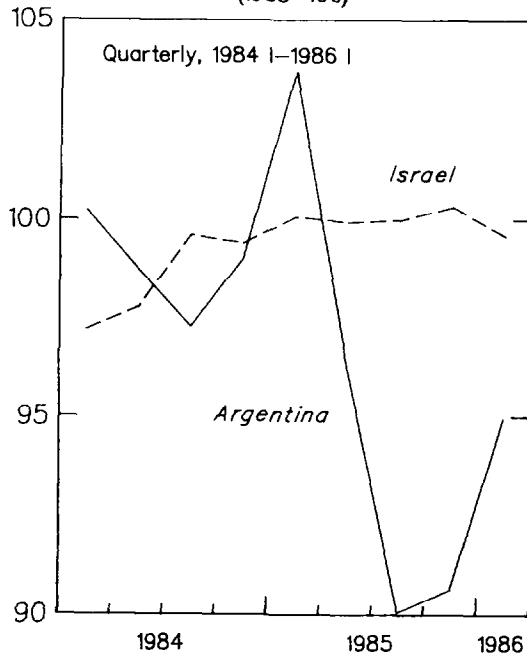


FIGURE 12
REAL GDP INDICES
(1985=100)

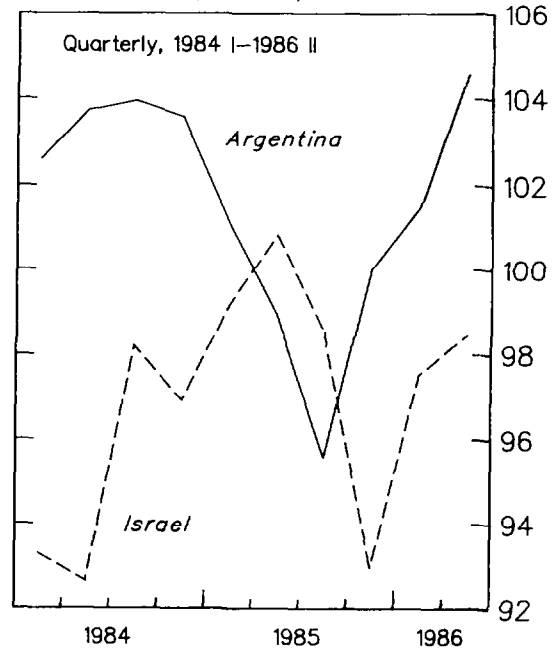
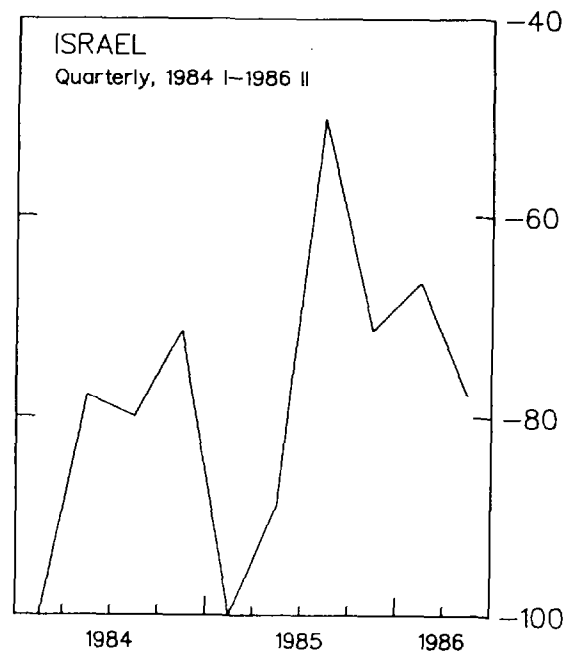
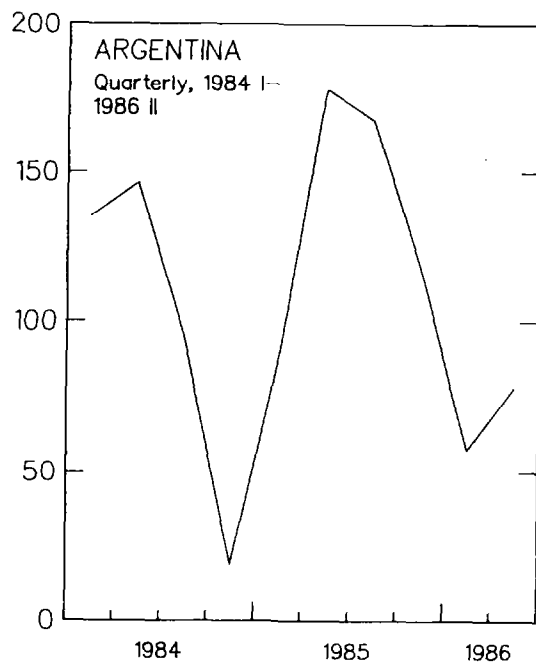


FIGURE 13
TRADE BALANCE ¹



¹ Index numbers, with relevant quarters of 1983=100, seasonally adjusted.



budget cut that took place. In addition to the behavior of the terms of trade, one plausible explanation for this apparent contradiction is that the increase in taxation may have been construed as temporary; another (*more popular in Israel*) is that the *increased stability of prices* reduced the public's precautionary demand for assets which led to an increase in consumption demand. This effect, however, can only be temporary. One way or another, the fact that the programs did not improve the trade account may have serious implications for the sustainability of the level of stability initially achieved.

III. Credibility, Inertia, and Controls

1. Credibility and inertia

A well-known argument of the rational expectations school ^{1/} says that inflation can be stopped abruptly, with low transition costs, if the government implements drastic fiscal and monetary policies which are consistent with price stability. However, these policies must be credible--the public must be convinced that the policies will be maintained over a long time.

Unfortunately, there is no simple way in which the government can convince the public of the persistence of its policies. Moreover, even if the fiscal policy is credible, monetary policy may not be, i.e., there is no guarantee that monetary policy will not accommodate inflation. This is a major difficulty since it is well known that inflation can evolve independently of the real budget deficit when monetary instruments are used in an accommodative manner. ^{2/}

Suppose that the public does not believe that the government will have the determination to enforce monetary tightness in the face of persistent inflationary expectations (for fear of large unemployment). In this situation, the public's inflationary expectations will tend to be maintained. Faced with this situation, the government will not be inclined to adopt tight monetary policies at all, and the public's expectations will have proved to be self-justifying or "rational".

Among the reasons the public may not accept the government's announced long-term disinflationary targets are that in countries with a long history of inflation and failures of disinflationary policies there exists a deep-rooted pessimism about the government's ability to control inflation. This causes considerable downward rigidity in basic, longer term, inflationary expectations. (An upward adjustment in basic inflationary expectations is obviously easier since the public is more easily

^{1/} See, for example, Sargent (1982).

^{2/} See, for example, Calvo and Fernandez (1983) for the possibility of varying the steady-state level of inflation, at a given budget deficit, by means of monetary managements, mainly changes in the reserve ratio of commercial banks.

convinced that the government's position on inflation could weaken.) These basic inflationary expectations are, in addition to institutional mechanisms, the forces behind the concept of "expectational inflationary inertia" and make the use of a monetary squeeze as the basic disinflationary instrument very costly. In contrast, the use of temporary incomes policies and initial price freezes may avoid the large costs on employment that arise from the combination of monetary restraint and inflationary inertia.

The question is, of course, what ensures that the expectational inertia will indeed be affected by the package of wage-price-exchange-rate freezes? Certainly, there is no guarantee that incomes policy will reduce the basic level of inflationary expectations, but there are two considerations which indicate that it could. First, provided that the proper adjustments in the fundamentals (such as the current account and the budget deficit) have been carried out, the imposition of a price (and exchange rate) freeze can help the government demonstrate that the economy can effectively function without inflation and without any stresses in the strategic areas--such as the current account of the balance of payments or the debt-income ratio. As a result of this demonstration effect, individual agents may come to accept the state of low inflation as a realistic possibility.

Second, as long as the government combines incomes policy with a fixed exchange rate, there is an explicit or implicit commitment not to resort to inflation to achieve short-term gains (in terms, for instance, of an erosion of the real wage to make the economy more competitive). When the fundamentals are consistent this commitment may be credible ^{1/} and may carry over to the period when controls are lifted. The credibility of this commitment also depends on the political stability of the government. In this respect, both Argentina and Israel changed regimes with the establishment of the wide coalition government in Israel and of the popular democratic government of Argentina.

It seems, therefore, that a combination of incomes policies with a proper adjustment of the fundamentals does provide, in an appropriate political environment, an opportunity to break the vicious circle associated with credibility and inflationary inertia.

2. Incomes policies, stabilization, and overadjustment

In addition to their role in reducing inflationary expectations, incomes policies can play another part in quick stabilization, one associated with the need to perform an immediate and drastic cut in the budget deficit. This cut must be based, in the short run, on an increase in taxation and on a reduction in subsidies, which may create an initial, sudden price rise. With the system of catch-up agreements and the inherent pessimistic expectations, such a price shock can become

^{1/} This is in the spirit of recent literature on "rules and discretion" as, for example, in Barro and Gordon (1983).

a longer-term wage-price spiral which will make the government's policy untenable. The immediate role of incomes policies is, therefore, to contain this initial shock to the price level arising from the adjustment measures themselves.

However, controls raise problems of their own. These include the well-known economic costs caused by interference with the market mechanism and the allocation of resources to direct supervision, ^{1/} but perhaps less well known is the problem that the need to use a pervasive and very visible enforcement mechanism is by itself an indication that any stability achieved is artificial. The demonstration that the economy can function without inflation requires the enforcement of controls to be accomplished with minimal coercion.

It is a common, and somewhat surprising, feature of both programs that they employed minimal enforcement in administering the controls. ^{2/} It seems, therefore, that the authorities made great efforts to reduce administrative intervention as much as possible. This involved the use of various methods of persuasion and propaganda. However, perhaps of greater significance was the strategy of creating conditions of excess supplies during the critical phase of the price freeze.

It is at this point that the short-term overshooting in real interest and wage rates steps in. High real interest rates induce reduction of inventories and, thus, excess supply, which will be amplified by the negative effect of high interest rates and lower real wages on consumer demand. ^{3/} In general excess supplies are not incompatible with inflationary expectations when the absolute price level is rigid downward. For example, in an uncontrolled economy with (short-term) downward rigidity in the price level and potential excess supplies in the commodities and labor markets, prices cannot go down by assumption. But if the money supply is increasing, and inflationary expectations prevail, prices may increase proportionately. Real wages will not rise (and hence the potential supply of commodities will not diminish) because of excess supply in the labor market. We therefore obtain a combination of excess supply and inflation which is closely related to the phenomenon of stagflation.

In an economy subject to effective price controls we may again have a coexistence of the basic inflationary expectations (driven by inertia)

^{1/} For a comprehensive study of the real costs associated with price controls in the last 25 years in Argentina, see Dadone and Ingaramo (1986).

^{2/} It is estimated that during the austerity period in Israel in the early 1950s, thousands of people were employed in the price controls system while in 1985 the number of people actively engaged in this area was not even in the hundreds.

^{3/} These effects may, however, be partially offset by the adverse effect of high interest on current production.

and excess supply. However, the effect of these expectations on the actual inflation rate is drastically reduced by the direct controls. But, as noted before, the effective implementation of controls is costly and, to reduce that cost, the government is motivated to generate excess supplies which reduce the need for administrative intervention. ^{1/}

IV. A Formalization

It may be useful to formulate the foregoing ideas more precisely. To analyze, first, the creation of excess supplies during the price freeze within the framework of a macroeconomic model, consider an economy which produces a single tradable final good (used for consumption, investment, exports, etc.). This output (y) is produced using domestic labor, an imported intermediate good (there is no direct import of consumption goods), and a constant initial stock of capital (including inventories). The demand function facing the country's output abroad is downward sloping, depending only on the (reciprocal of) real exchange rate (in units of domestic currency per foreign currency unit).

Consider a solution to the IS/LM model, where the (demand-determined) level of output is given by:

$$Y^D = Y^{D(+)(-)(+)(+)}(m, t, q, \pi) \quad (1)$$

where m denotes real balances, t denotes tax parameters, q is the real exchange rate, and π denotes short-term inflationary expectations (which are also assumed to equal the actual rate of inflation). The signs above the variables are those of the partial derivatives. In a similar manner the solution for the real interest (i) in the IS/LM model is given by:

$$i^D = i^{D(-)(-)(+)(-)}(m, t, q, \pi) \quad (2)$$

In this formulation we assume that real government expenditures are constant (which was roughly the case in practice), that the momentary price level is given, and that short-run inflationary expectations (during the official price freeze) are zero or some low-fixed value.

The aggregate supply function is given by:

$$Y^S = Y^{S(-)(-)(-)(-)(-)}(q, w, t, i, C) \quad (3)$$

^{1/} The creation of excess supplies clearly involves costs of its own. The government must, therefore, eventually strike some balance between these and the administrative and economic costs of the price controls.

where the sign of t reflects the negative effect of taxes on supply and where C denotes price controls which affect aggregate production negatively. An increase in the interest rate affects supply negatively through the increased costs of working capital and through the increased rate of bankruptcies. An increase in import prices (through q) and an increase in the real wage (w) also affect supply negatively.

We shall assume throughout that during the price freeze $Y^S \geq Y^D = Y$ which equals actual output (therefore, i is determined by equation (2)). Although price controls take the form of maximum prices, the price level cannot fall in the short run because of the assumed price rigidity. Substituting equation (2) in equation (3), we obtain:

$$Y^S = Y^S(q, m, t, w, C, \pi) \quad (4)$$

where the signs of equation (3) are assumed to dominate.

The trade balance is given by:

$$B = B(Y, q) \quad (5)$$

where $Y = Y^D$. It is assumed that imports are positively related to output and that an increase in the real exchange rate improves the balance of trade. Export demand of the country's final good is fully determined by q .

Finally, combining equations (1) and (4), we obtain the excess supply function:

$$E \equiv Y^S - Y^D = E(q, m, t, w, c, \pi) \quad (6)$$

The tightening of monetary policy, through a reduction in m , reduces both demand and supply. However, in the short run the liquidation of inventories following a sharp rise in i is assumed to dominate--producing excess supply.

A state of excess supplies can be maintained in the short run because of downward rigidity in the price level. At the same time, the excess supply is not exported when q is held constant because the demand curve for exports is downward sloping.

The original position, prior to stabilization, can be described by the point A in Figure 14, where the curves Y^{DD} and Y^{SS} (corresponding to equations (1) and (4), respectively) intersect. Through this point we may draw an iso-B curve corresponding to equation (5), and reflecting the original level of the balance of trade. The relatively flatter slope of BB reflects the usual conditions of trade balance stability.

The initial fiscal contraction associated with stabilization is reflected in an increase in t . This shifts both Y^{DD} and Y^{SS} to the left, which does not ensure the creation of excess supplies. Moreover, the imposition of controls tends to reduce excess supply. However, two factors do tend to work in the direction of increasing excess supplies. First, there is the monetary contraction connected with stabilization which increases excess supplies through the liquidation of inventories. Then there is the reduction in real wages. Both shift the Y^{SS} curve to the right. We may assume that in this manner an excess supply of BC (Figure 14) is created at the original level of q , with the economy at point B .

Note that by increasing the real exchange rate to q_1 the government may reduce unemployment and improve further the trade balance. However, in doing so, it will reduce the excess supply (see equation 6) and, thus, make the supervision of the price freeze more difficult. 1/

We can see from equation (6) that by manipulating the policy instruments (q, m, t, w 2/) the government may increase E which helps maintain the controls. However, the use of each policy instrument for this purpose involves other types of costs. For example, a reduction in q worsens the trade balance, which may undermine the fixed exchange rate strategy. The reduction of m raises interest rates and thus deepens the recession and impedes growth. The government's pressure to reduce w may be undesirable socially and costly politically. This is mitigated to some extent by the reduction in unemployment. The advantages in creating excess supplies have to be weighed against the foregoing costs.

Let us turn now to a more explicit formulation of the role of E in the price control regime. In the spirit of the "inflationary-inertia" theory, we assume that in the uncontrolled economy, inflation (which may also equal short-term expectations) is determined by:

$$\pi = \pi_I + f(E) \quad f(0) = 0, f' < 0 \quad (7)$$

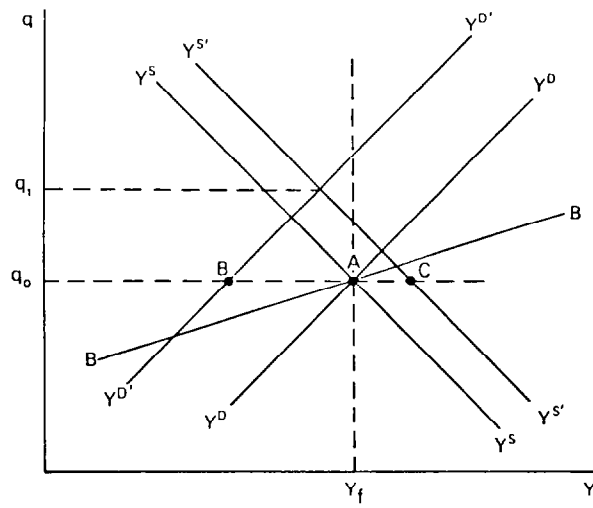
where π_I denotes the component associated with inflationary inertia (π_I may be considered as a function of all past variables, including past inflation rates, budget deficits, and import surpluses). E denotes current excess supply which affects inflation negatively. 3/ If prices are rigid downward and flexible upward, we shall have $\pi = \pi_I$, except when there exist excess supplies.

1/ One way of reducing the burden of controls is by giving up the fixed exchange rate policy and switching to a crawling peg, as Argentina did in April 1986. This, however, is undoubtedly a psychological blow to the program.

2/ In the short run the government is assumed to have sufficient influence on wages within the framework of its incomes policies.

3/ One may add in equation (7) a component which depends on new information obtained in the current period, like an announcement of a new government plan, but this is not essential for the presentation.

FIGURE 14



Note: Y_f denotes full employment output.
It is not essential for $Y^{S'}$ to be to the right of Y^S ,
but B must be to the left of C.



We assume that by using controls (C), measured (say) by the input of supervisory effort, the government may reduce the effect of π_I on π . Thus, let:

$$\pi = \phi(C) \pi_I + f(E), \quad \phi(0) = 1, \quad \phi' < 0. \quad 1/ \quad (8)$$

Solving for C, we obtain:

$$\begin{matrix} (-)(-)(+) \\ C = U(E, \pi, \pi_I) \end{matrix} \quad (9)$$

where the negative partial derivative of π means that when the target level of π is higher (less stringent), the government may do with less controls.

We can see that during the price freeze there exists a trade-off between C and E, for given levels of π_I and π , along the P_0 curve, as shown in Figure 15. Using much C involves economic and other costs which the government may reduce by using its policy instruments to create excess supplies. The optimal combination of C and E is at Q_0 . The more ambitious is the government with respect to its target π (denoted π^*), the further out will the P curve lie.

If the government succeeds in maintaining a low π without a deterioration in the budget deficit or in the trade balance, then one may assume that π_I will be gradually reduced. This will shift the P curve leftward to P_1 where the chosen point is represented by Q_1 . Thus, as π_I is reduced, less of C and E is required to attain the same inflation target. A success of the disinflationary policy means a gradual abolition of controls along OQ_0 .

Substituting equation (6) into equation (9) and solving for C, we obtain: 2/ 3/

$$\begin{matrix} (+)(+)(?)(+)(-)(+) \\ C = C(q, m, t, w, \pi, \pi_I) \end{matrix} \quad (10)$$

Equation (10) shows how the various policy parameters can be used to reduce the burden of controls. However, each of these measures involves a specific cost, as we explained earlier.

The data on the stabilization programs, which we described earlier, revealed similar "tastes" by the government by choosing a monetary

(-)(+) (-)

1/ More generally, $\pi = F(C, \pi_I, E)$.

2/ The effect of π in equation (9) is assumed to dominate.

3/ In this derivation, we used the (stability) assumption that $(\partial \bar{U} / \partial E) / (\partial E / \partial C) < 1$, meaning that the positive effect of C on U through E (i.e., an increase in C reduces Y^S and, therefore, reduces E which increases the need for controls) is less than unity.

squeeze and a wage cut of similar form in order to reduce the burden of controls in the early stages of stabilization. This particular mix resulted in a small effect on unemployment but seems to have slowed down economic growth for a while. Both governments did not exercise in the early stages of the programs the option of reducing the real exchange rate in order to reduce the need for controls.

The foregoing model predicts that the overshooting should be accompanied by an improvement in the trade balance. This prediction is confirmed only partially by the data. While it is true that there was some improvement in the trade balance during the first quarter (as we have seen earlier), the trade balance returned to its original state in the second quarter when the overshooting in wages and interest rates was still considerable. This is related to an increase in spending, the nature of which is still unclear.

V. The Adjustment of the Fundamentals

It is clear that long-term stability can be achieved and maintained only if it is based on a balanced government budget and on a sustainable position of the current account of the balance of payments. It was seen earlier that the programs of both countries included a significant closing of the budget deficit. It is extremely important, in terms of breaking past inflationary trends and, therefore, expectations, that these steps should be interpreted as part of a permanent policy of long-run budgetary equilibrium.

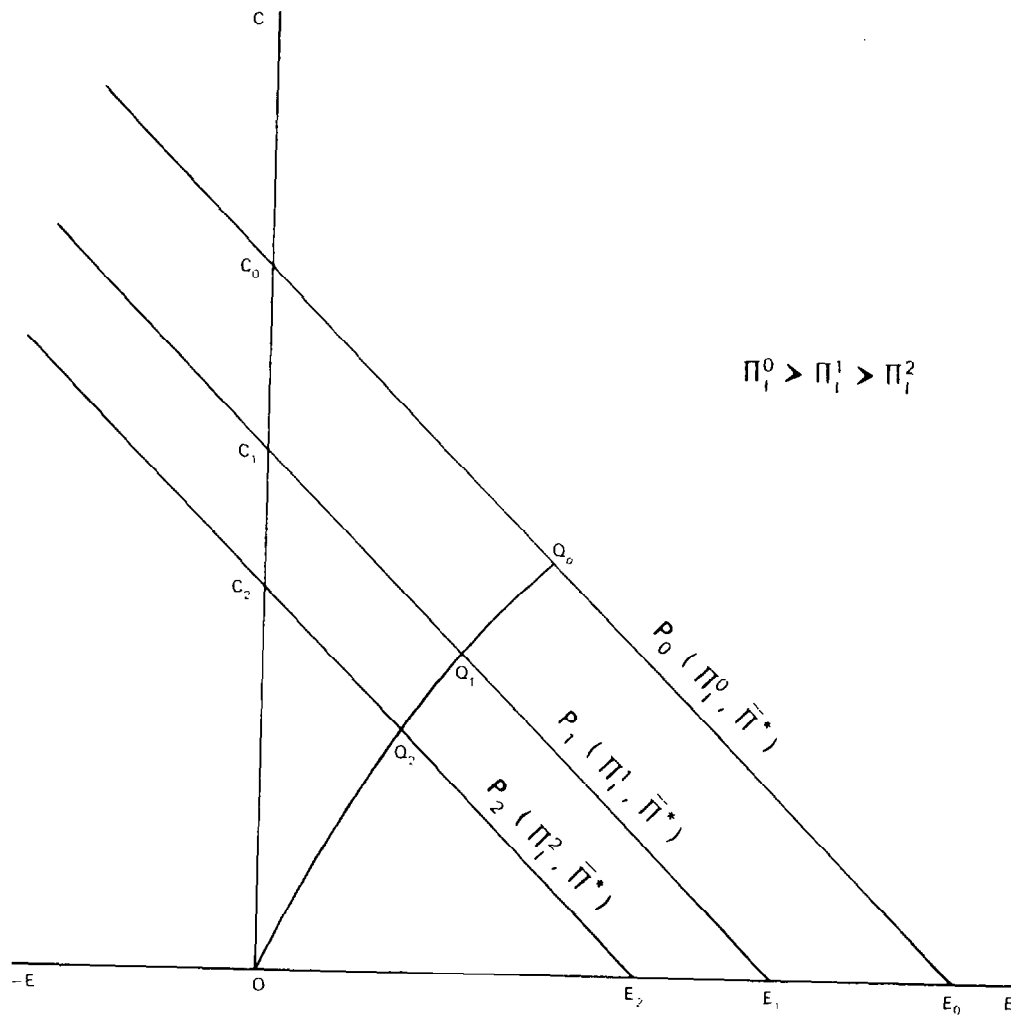
In this regard, some doubts remain about the longer-term nature of the fiscal improvement in both countries, where the bulk of the gains came from higher revenues without corresponding declines in public sector expenditures. Moreover, a large portion of the growth in revenues arose from temporary taxes and other contingency measures. Also, particularly in Argentina, some of the fiscal measures, such as import surcharges and export taxes, have negative structural effects and may hinder the long-term performance of the balance of payments.

Some aspects of the problems arising from the specific form of the budget cut can be illustrated by means of the model described in Figure 14. The termination of the short-term overshooting leaves the economy with both Y^D and Y^S shifted to the left as a result of the increased level of taxation designed to close the budget deficit. Since in the longer run price controls are removed, the economy will actually be at the intersection of Y^D and Y^S to the left of the point A in a state of unemployment. ^{1/}

The return to full employment could be achieved by a reduction in real wages. However, this cannot be expected realistically because of

^{1/} This unemployment will enable some improvement in the trade balance as a result of reduced imports.

FIGURE 15
THE TRADE-OFF BETWEEN PRICE CONTROLS
AND EXCESS SUPPLY





social considerations or political constraints. Besides, the high level of taxation would still impede normal economic growth. The required long-term solution should take the form of a simultaneous reduction in taxes and public consumption. The released resources will be diverted to private investment which will be accommodated by further easing of monetary policy. This will enable an economically efficient form of full employment.

The confrontation with the basic task of reducing the public sector is, therefore, the main test the programs must face in the longer run. As long as this aspect remains unsolved, the pressures resulting from the absence of growth will induce the government to ease the burden of taxation through increased budget deficits which will undermine price stability.

Turning to the comparison between the two countries, it seems that the basic difference between them in the area of fundamentals is related not to the fiscal but rather to the external position. We know from past experiences in both countries, particularly those arising from the collapse of exchange-rate-based stabilization programs, that a current account deficit raises strong expectations of devaluation which lead eventually to inflationary consequences. If stability is to be sustained, it is therefore imperative to attain a level of external adjustment that is necessary to remove this threat from the system.

In this respect, developments in Israel have been very encouraging. The import surplus showed a marked reduction in the period preceding the plan and the capital account was revolutionized as a result of a shift in the U.S. aid from loans to grants. This in itself was sufficient to balance the current account. In addition, there was the special U.S. grant of US\$1.5 billion (over two years) specifically made in support of the program, and there were substantial gains from the reduction in the price of oil imports. Consequently, no inflationary influences on expectations were exerted from the balance of payments. The presence of external support and the perception of genuine improvements in the balance of payments led, therefore, to an increase in confidence in the overall program.

The external situation in Argentina is quite different. In recent years Argentina has been running a current account deficit of over US\$2 billion, which is caused by the large interest payments component, which outweighs the trade account surplus. Unlike in Israel, most of the foreign debt is not contracted on concessional terms. Although there was some favorable response of the balance of payments to the program, many of the gains appear to be based on temporary developments without a structural improvement. Under these circumstances, additional fundamental measures should have been incorporated to the program in order to orient it more heavily toward a significant improvement in the trade account. The short-term nature of the improvements that took place during the program leads to the conclusion that the basic external difficulties of Argentina were not alleviated by the plan.

It is, therefore, quite possible that the difficulties that Argentina encountered at the end of the first year of the stabilization effort are connected not only to the intractability of the public sector situation but to the absence of a basic and structural solution to the external problem. The shift to a crawling-peg system in April 1986 is, therefore, unlikely to prevent, by itself, external sector tensions, and may rekindle the uncertainties which in the past led to the re-emergence of inflation.

Therefore, the transition to longer-term stability following the initial positive effects of the shock, and the overall sustainability of the achievements, cannot be assured without dealing with the fundamentals in the proper manner.

VI. The Perspective of the 1967 Program in Argentina

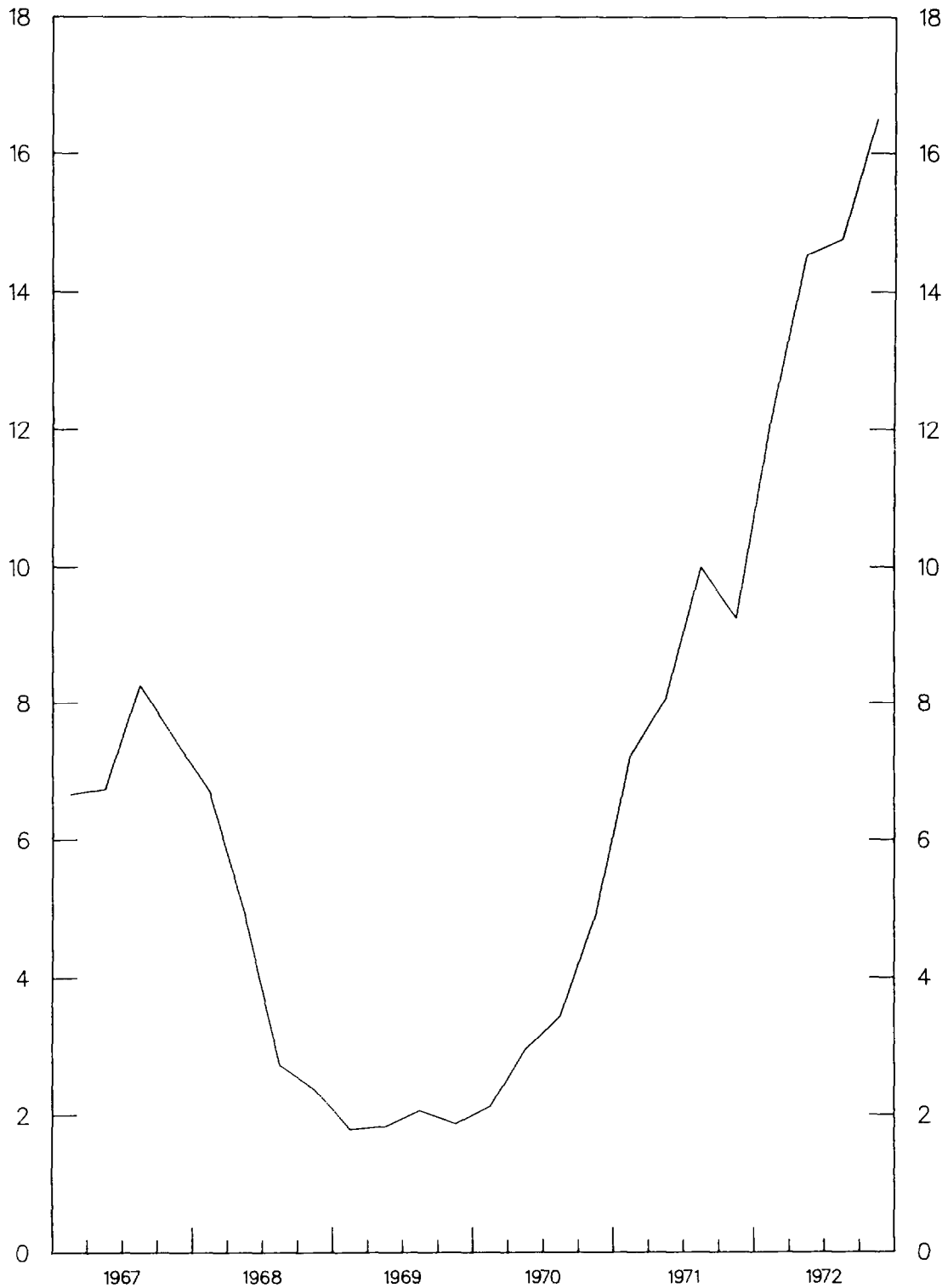
In order to gain some perspective of the novel features of the 1985 programs it is useful to compare them with a serious stabilization effort of the past. For this purpose we chose the 1967-70 anti-inflationary program in Argentina (see De Pablo (1982) and Yeager (1983)).

There were two basic differences in the context of the 1967 and Austral programs: the rate of inflation prior to stabilization was much lower in 1967 and so was the size of the external debt. These factors had a decisive effect on the differences between these programs in terms of the short-run dynamics and of the ability to sustain the disinflationary effort. However, the nature of the difficulty in maintaining longer-term stability seems to be similar in both programs.

The disinflationary program of March 1967 was launched when the rate of inflation was about 30 percent a year. The program, which was successful in stabilizing prices for a considerable time span, contained most of the elements of the Austral Plan. Yet, its strategy with respect to the wage-price complex was quite different. No freeze was imposed but some controls over prices were established on the basis of voluntary participation of enterprises, supported by a complicated set of incentives. The control over wage agreements was, however, more rigid, stipulating maximum yearly wage increases for the public and private sectors.

The main difference between the short-term transitional strategy of the two programs was that, in contrast with the Austral Plan, no attempt was made in 1967 to achieve immediate synchronization of prices and the exchange rate at the outset of the program. As in 1985 the program started with a big nominal devaluation but prices were allowed to adjust gradually to the new level (Figure 16). Since the nominal exchange rate was pegged at the new level (Figure 17), the erosion in the real value of the currency proceeded gradually (Figure 18). However, until the

FIGURE 16
RATE OF CPI INFLATION¹
QUARTERLY, 1967 I-1972 IV



¹ Inflation is the annual rate, measured by the average of each quarter over previous year.



FIGURE 17
NOMINAL EXCHANGE RATE
QUARTERLY, 1966 I-1971 IV

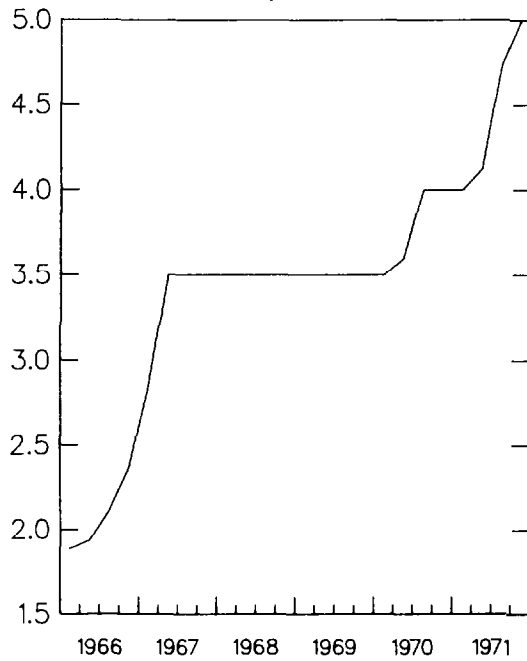


FIGURE 18
REAL EXCHANGE RATE
QUARTERLY, 1966 I-1972 IV

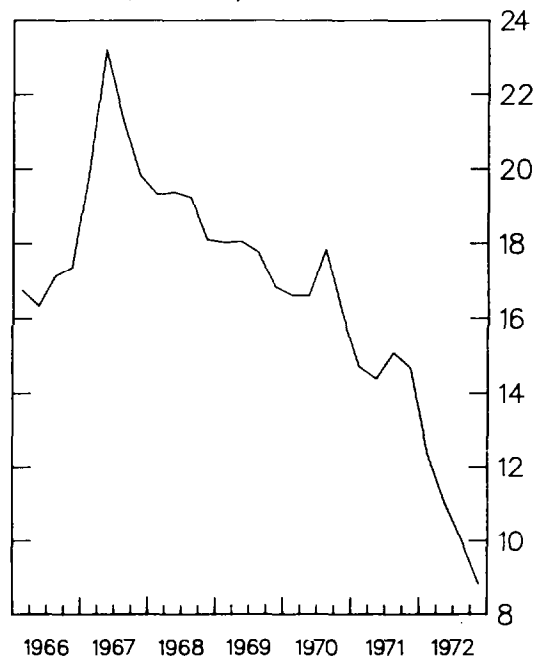


FIGURE 19
TRADE BALANCE
YEARLY, 1965-1971

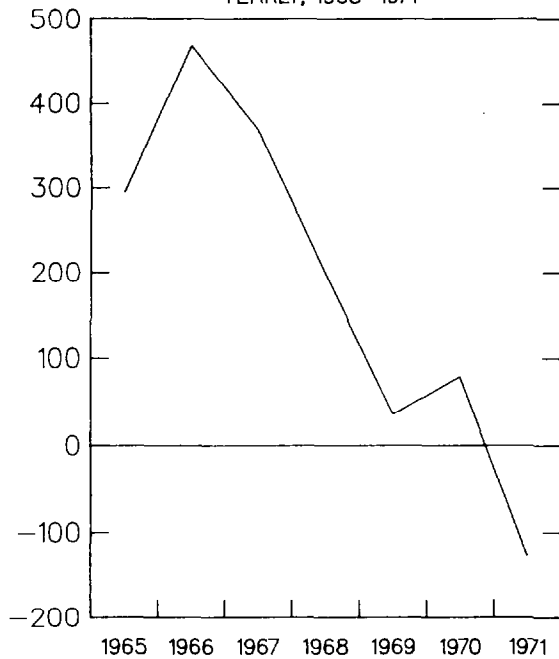


FIGURE 20
EXTERNAL DEBT
YEARLY, 1965-1972

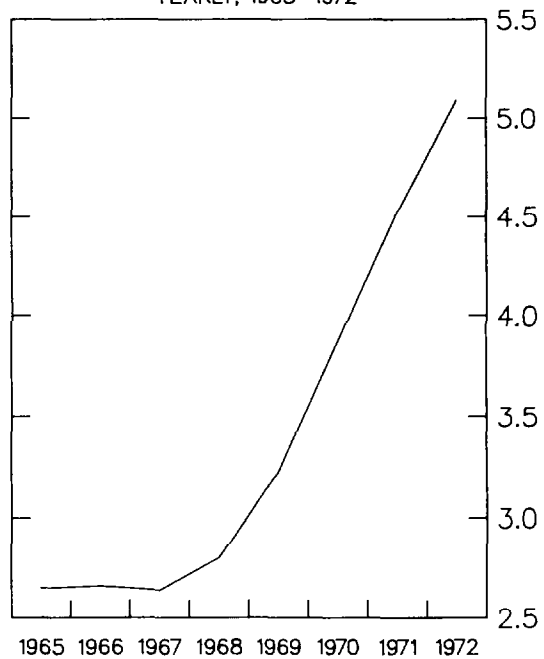




FIGURE 21
RATIO OF FISCAL DEFICIT TO GNP
YEARLY, 1966-1972

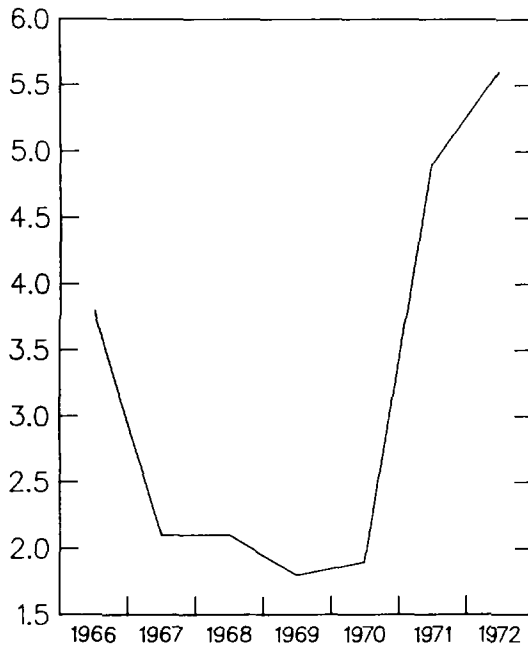


FIGURE 22
REAL WAGE INDEX (1965=100)
YEARLY, 1965-1971

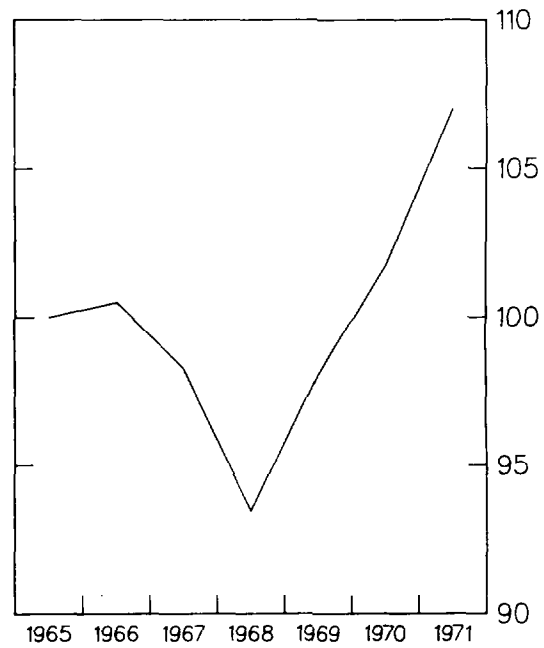


FIGURE 23
REAL GDP INDEX (1965=100)

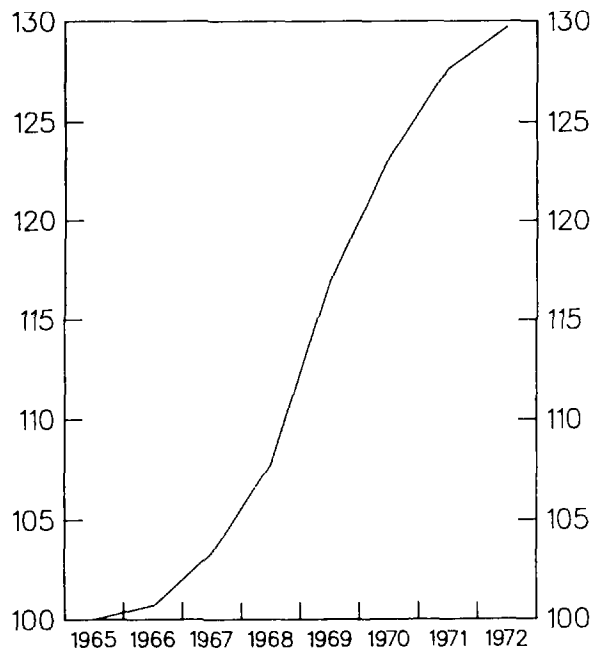




FIGURE 24
REAL INTEREST RATE
QUARTERLY, 1967 I-1971 IV

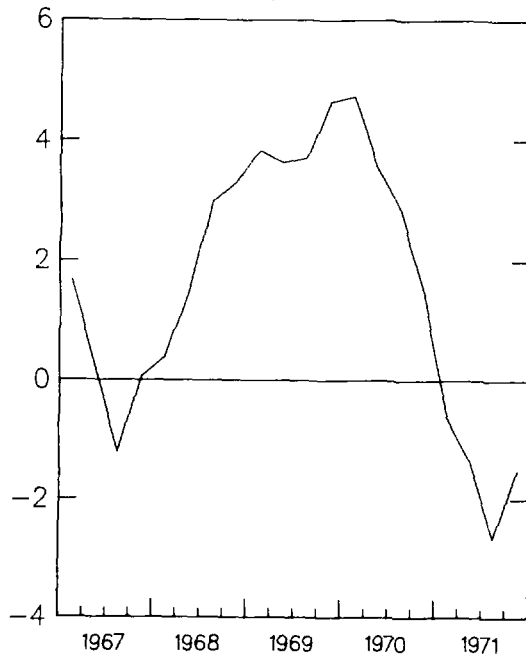


FIGURE 25
NOMINAL INTEREST RATE
QUARTERLY, 1967 I-1971 IV

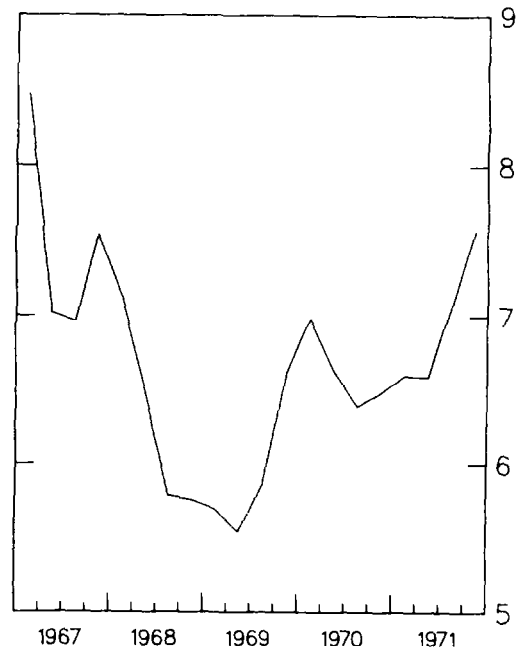
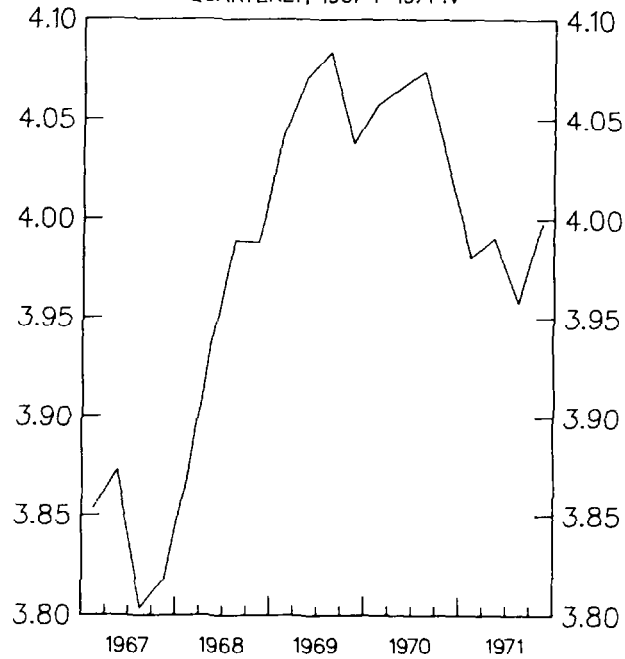


FIGURE 26
REAL MONEY BALANCES (M1-IN LOGS)
QUARTERLY, 1967 I-1971 IV



100



middle of 1970 the fall in the real exchange rate, compared with the level prior to stabilization, was moderate.

The successful reduction in the rate of inflation could be attributed to the substantial reduction in the budget deficit (Figure 21) combined with a fixed exchange rate policy and wage controls. This is similar to the Austral Plan. In addition, it is interesting to note that the policies of short-term overshooting in real wages (Figure 22) and in real interest rates (Figure 24) were also employed in the 1967-70 program. This may have been motivated partly by the need to restrain demand in the absence of strict incomes policies, along the trade-off described in Section V, in order to redress the inflationary trend and to support the fixed exchange rate and the loose system of price guidelines implements. It seems, therefore, that the main innovation of the Austral Plan, compared with that of 1967, was in the more strict price freeze policy and in its synchronization with the pegging of the exchange rate.

Unlike the 1985 programs, the contractionary side-effects of disinflationary policies are not evident in the 1967 plan (see the GDP growth curve in Figure 23). This can be attributed partly to the fact that the increase in the real interest rate during the overshooting period was much smaller in 1967-70 (the quarterly interest rates in 1967-70 were comparable to the monthly rates in the Austral Plan). The higher real rates in 1985 can, in turn, be related to the need to implement stricter price controls in order to deal with a higher level of inflationary inertia (when π_I in Figure 15 is higher, both C and E need to be higher, leading to sharper contractionary effects).

Another lesson of that experience has to do with the importance, mentioned above, of solving the structural external problem of the Argentine economy. It is apparent that the reversal of the program arose from the need to abandon one of its basic features, namely, the exchange-rate-based stabilization strategy. Although the fiscal gap, as a source of liquidity injection, was largely corrected, the external imbalance of the economy was continuously deteriorating. This was reflected by the erosion of the real exchange rate, the increase in trade deficits (Figure 19), and the sharp rise in foreign debt (Figure 20). This lack of balance in the external accounts created a perception of unsustainability, fed expectations of devaluation and inflation, and eroded the credibility base of the program. It seems, therefore, that the fiscal and wage policies were not stringent enough to ensure external equilibrium which is necessary for price stability. 1/

1/ It should also be noted that changes in the external terms of trade also played an important role in the development related to the 1967 program.

VII. Concluding Remarks

The comparison of the recent stabilization experiences of Israel and Argentina show some common patterns in the perception of the nature of the problem and in policy implementation, which give rise to three basic observations. In the first place, they illustrate that there are considerable differences in the strategy to disinflate in cases of very high and persistent inflation (or hyperinflation) compared with situations when inflation is moderate and occasional. In particular, it is important to recognize that, when inflation becomes ingrained in the system, it acquires its own dynamics. This requires comprehensive stabilization packages containing specific transitional mechanisms to deal with the inertial forces which are certain to develop as inflation rises. The transitional mechanisms should combine and coordinate the correction of fundamental imbalances with the temporary implementation of direct price-signalling policies which serve both to assure individual economic agents that a clear-cut reversal in previous trends has taken place and to indicate the commitment of the government to implement policies consistent with the price signals.

Second, transitional incomes policies and direct price interventions may accompany, but never substitute for, the appropriate correction of the fundamental imbalances of the economy, including, particularly, budgetary adjustments and external sector sustainability. Moreover, the controls and the signalling policies which are designed to address the problem of lack of credibility and to deal with inertial inflation will not be successful if demand is not restrained over and above the short-run balancing requirements. To be effective in breaking inflationary inertia, an overadjustment that leads to some degree of excess supply in key markets should be implemented during the transition. The overshooting observed in both countries in the instruments of adjustment policies, such as real wages and real interest rates, are consistent with this observation. The implicit trade-off between excess supply and the strength of the controls for different degrees of inertial inflation indicates that overadjustment provides also the mechanism for the eventual smooth elimination of direct intervention.

Third, the initial success in breaking the inflationary trend could be translated into sustainable stability only to the extent that the adjustment of the fundamental variables can be maintained. In the longer run, not only a balanced budget but also a reduction in the size of the public sector are required for sustained stability. The most significant indicator for the state of the fundamentals seems to be the external balance. A failure to bring this balance into a sustainable position undermines anti-inflationary efforts and may well be a major cause of the problems with the Austral Plan in Argentina. In this respect, the situation in Israel is more satisfactory in the present, but hard struggles of maintaining the external balance are still ahead.

Data Sources and Definitions

A. Sources

For Israel, data are obtained from the Bank of Israel's Research Department's data bases, and the Central Bureau of Statistics.

For Argentina, Fund staff estimates have been used, except for data on nominal and effective exchange rates, employment, trade balance, and government deficit, which are taken from Novedades Económicas, Fundación Mediterránea, various issues. Data for real wages are obtained from the U.S. Department of Commerce.

B. Definitions

- Inflation rates are measured from CPI.

- Nominal interest rate for Israel is defined as the interest on free commercial short-term bank credit denominated in shekelim. For Argentina, it is defined as free market rates on bill brokerage operations. Real rates are obtained by deflating nominal rates by the previous month's inflation rate.

- Real interest rates for the period 1967-72 in Argentina are calculated as:

$$R_I = \left(\frac{QINF + 1}{QINT + 1} \right) - 1$$

where:

R_I = real interest rate in percent per quarter;

$QINF_t = \left(\frac{QCPI_t}{QCPI_{t-4}} \right) / 4$ is the inflation rate;

QINT = quarterly nominal interest rates; and

QCPI = quarterly average of monthly CPI.

- Real exchange rates against the U.S. dollar and the basket are defined as nominal exchange rates against the U.S. dollar and the basket, respectively, deflated by CPI.

- Real money balances are obtained by deflation of nominal balances using the CPI.

- Real wages are equal to nominal wage index divided by CPI.

- Government deficit in the case of Israel is the deficit of domestic public sector (including the Government and the Jewish Agency), and is on a cash basis. This deficit includes an imputed real interest rate on public debt. For Argentina, it is calculated from total public sector debt.

- Monthly indices have been rebased to 1985 by setting the average of January-June 1985=100. Quarterly indices have been rebased by setting the average of the first two quarters of 1985=100.

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